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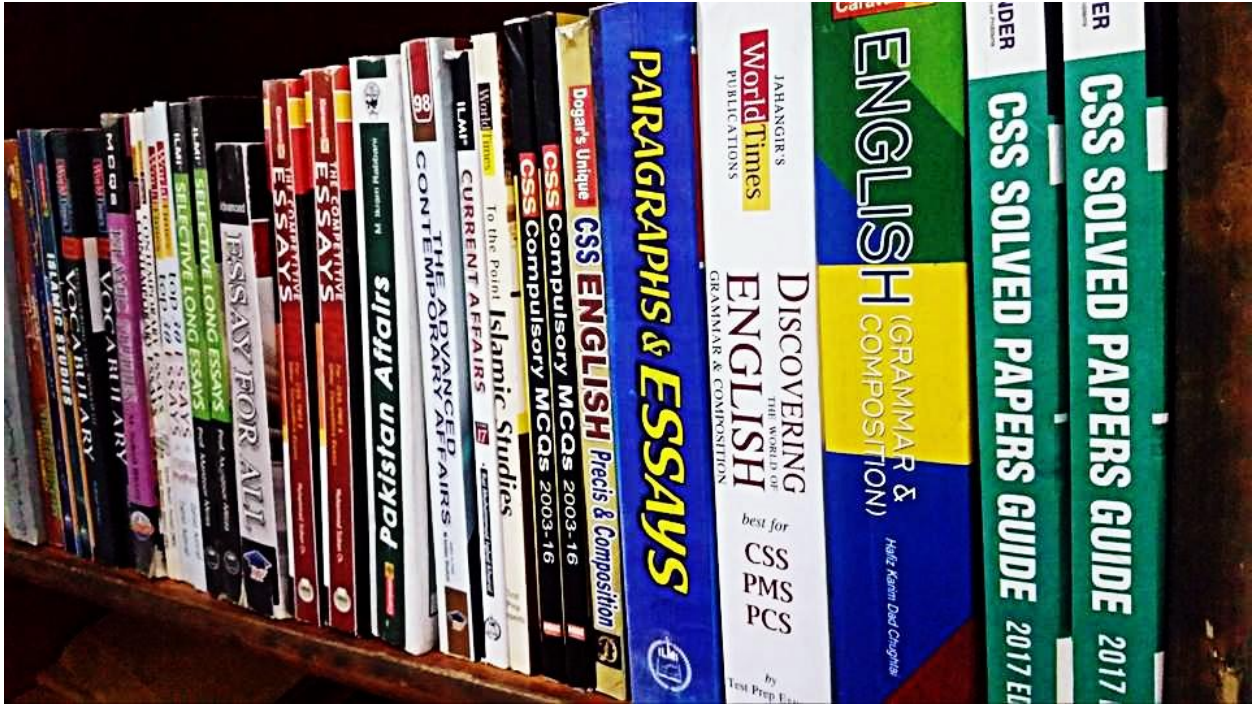
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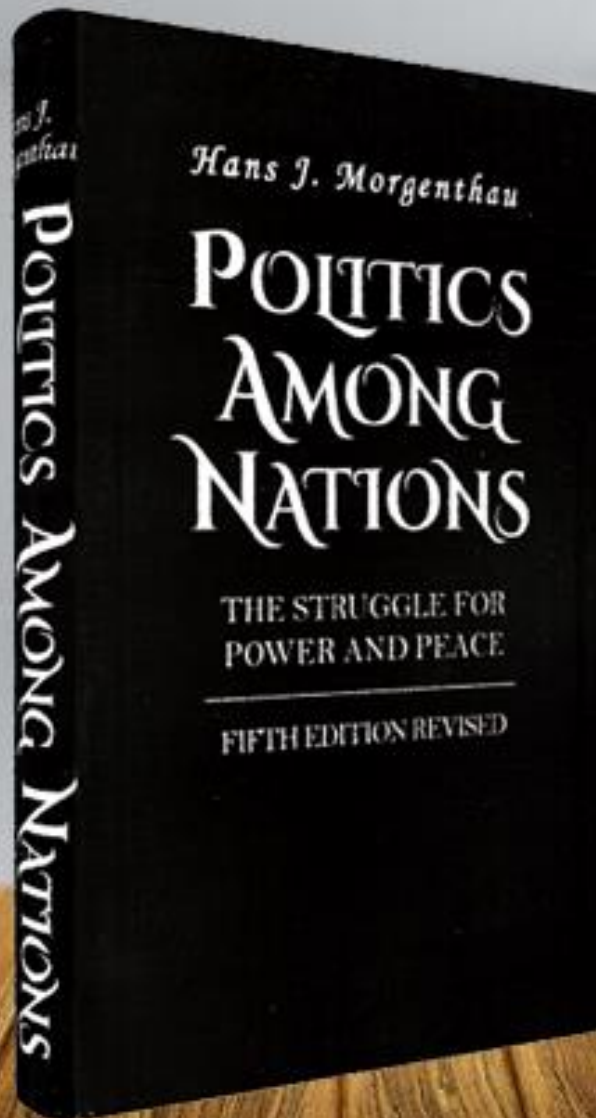
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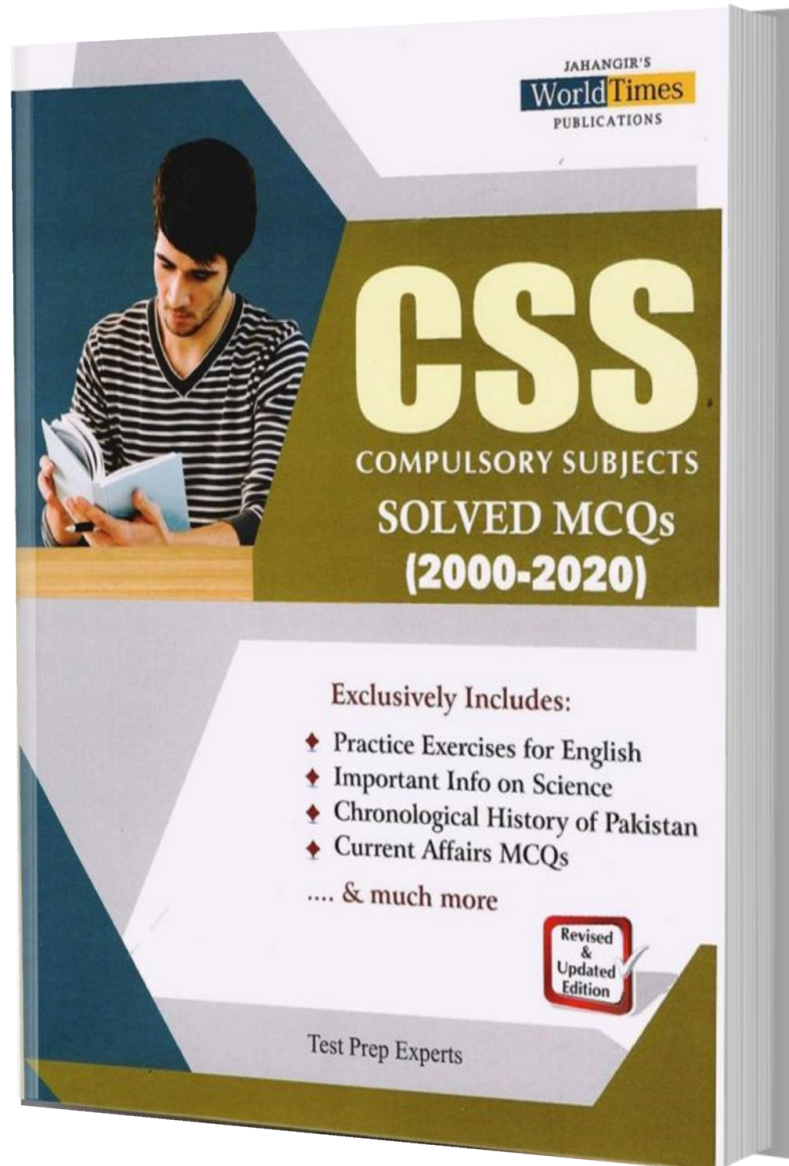
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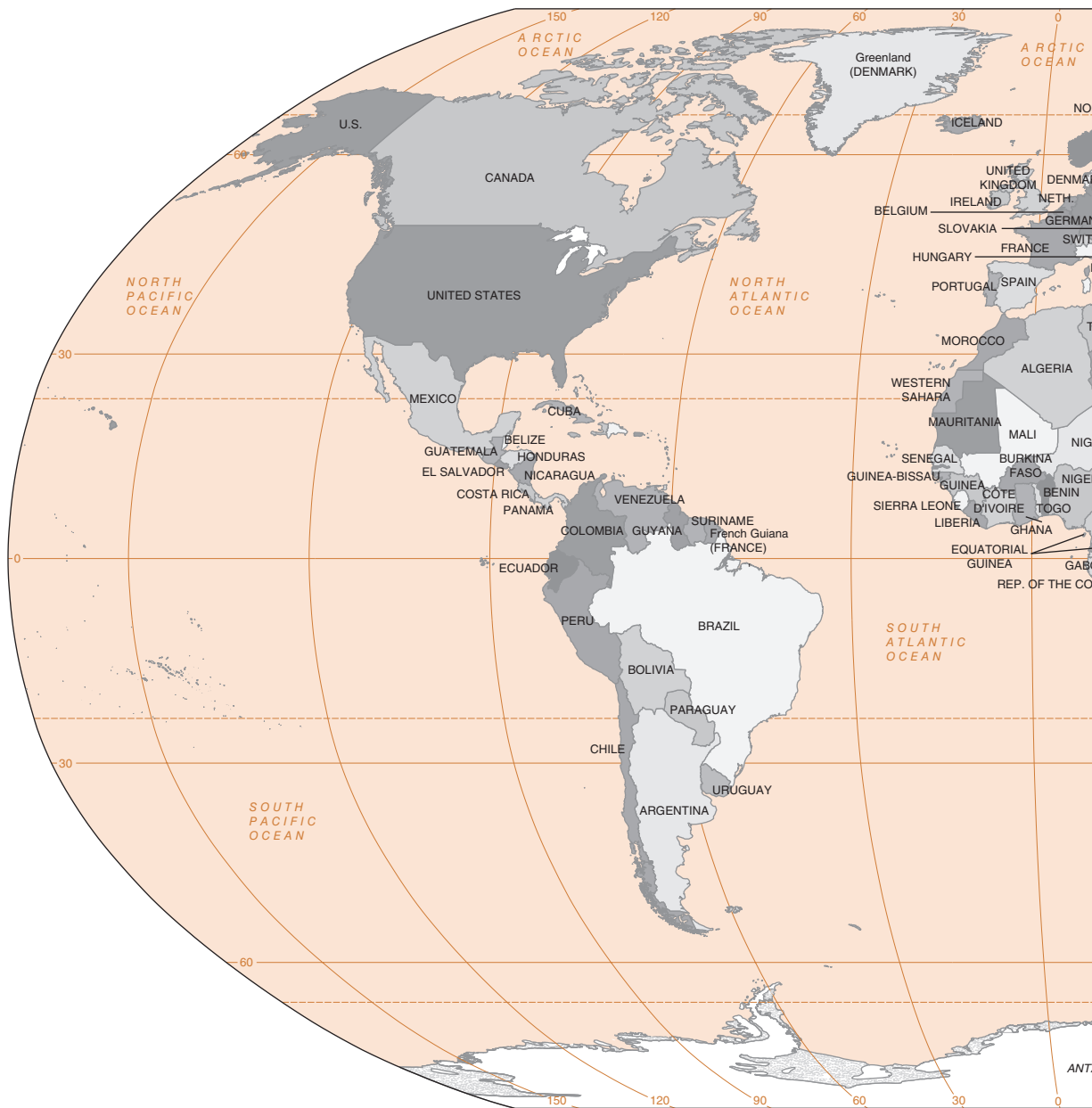
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International Economics

SEVENTEENTH EDITION

ROBERT J. CARBAUGH

Professor of Economics, *Central Washington University*



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I believe the best way to motivate students to learn a subject is to demonstrate how it is used in practice. The first sixteen editions of *International Economics* reflected this belief and were written to provide a serious presentation of international economic theory with an emphasis on current applications. Adopters of these editions strongly supported the integration of economic theory with current events.

The seventeenth edition has been revised with an eye toward improving this presentation and updating the applications as well as including the latest theoretical developments. Like its predecessors, this edition is intended for use in a one-quarter or one-semester course for students having no more background than principles of economics. This book's strengths are its clarity, organization, and applications that demonstrate the usefulness of theory to students. The revised and updated material in this edition emphasizes current applications of economic theory and incorporates recent theoretical and policy developments in international trade and finance. Here are some examples.

INTERNATIONAL ECONOMICS THEMES

This edition highlights five current themes that are at the forefront of international economics:

■ GLOBALIZATION OF ECONOMIC ACTIVITY

- Is international trade an opportunity or a threat to workers?—Ch. 1
- U.S. apple growers and competition from China—Ch. 1
- Is international trade responsible for the loss of American jobs?—Ch. 3
- Shifting competitiveness in shipping routes—Ch. 3
- How containers revolutionized the world of shipping—Ch. 3
- Factor mobility, exit barriers, and trade—Ch. 2
- Dynamic gains from digital trade—Ch. 2
- Wooster, Ohio bears brunt of globalization—Ch. 2
- Comparative advantage and global supply chains—Ch. 2
- Caterpillar bulldozes Canadian locomotive workers—Ch. 9
- The Tax Cuts and Jobs Act of 2017: Apple Plans to Build a New Campus—Ch. 9
- Diesel engines and gas turbines as engines of growth—Ch. 1
- Waves of globalization—Ch. 1
- Constraints imposed by capital flows on the choice of an exchange rate system—Ch. 14

■ FREE TRADE AND PROTECTIONISM

- Does trade with China take away blue-collar American jobs?—Ch. 3
- Would a tariff wall protect American jobs?—Ch. 4
- Donald Trump's border tax: How to pay for the wall—Ch. 4
- Vaughan Basset Furniture and dumping—Ch. 5
- U.S. lifts its restrictions on oil exports—Ch. 6
- U.S. Export-Import Bank avoids shutdown—Ch. 6
- Whirlpool agitates for antidumping tariffs on clothes washers—Ch. 5
- Wage increases and China's trade—Ch. 3
- Should shoe tariffs be stomped out?—Ch. 4
- Element Electronics brings TV manufacturing back to the United States—Ch. 1
- Government procurement policies and buy American—Ch. 5
- Carbon tariffs—Ch. 6
- Carrier agrees to keep jobs in India—Ch. 6
- Lumber imports from Canada—Ch. 6
- Bangladesh's sweatshop reputation—Ch. 7
- Does the principle of comparative advantage apply in the face of job outsourcing?—Ch. 2
- Trade adjustment assistance—Ch. 6
- North Korea and economic sanctions—Ch. 6
- Boeing outsources work, but protects its secrets—Ch. 2
- WTO rules against subsidies to Boeing and Airbus—Ch. 6
- Does wage insurance make free trade more acceptable to workers?—Ch. 6
- China's hoarding of rare earth metals declared illegal by WTO—Ch. 6
- The environment and free trade—Ch. 6

■ TRADE CONFLICTS BETWEEN DEVELOPING NATIONS AND INDUSTRIAL NATIONS

- Russia hit by sanctions over Ukraine—Ch. 6
- U.S. economic sanctions and Iran—Ch. 6
- Declining oil prices test OPEC—Ch. 7
- China's economic challenges U.S.—Mexico tomato dispute—Ch. 8
- Is state capitalism winning?—Ch. 7
- Canada's immigration policy—Ch. 9
- Is international trade a substitute for migration?—Ch. 3
- Economic growth strategies: Import substitution versus export-led growth—Ch. 7
- Does foreign aid promote the growth of developing countries?—Ch. 7
- The globalization of intellectual property rights—Ch. 7
- Microsoft scorns China's piracy of software—Ch. 6
- China's export boom comes at a cost: How to make factories play fair—Ch. 7
- Do U.S. multinationals exploit foreign workers?—Ch. 9

■ LIBERALIZING TRADE: THE WTO VERSUS REGIONAL TRADING ARRANGEMENTS

- Modernizing NAFTA—Ch. 8
- Brexit and the Eurozone—Ch. 8
- Free-trade agreements bolster Mexico—Ch. 8
- Deflation and the Eurozone—Ch. 8
- Does the WTO reduce national sovereignty?—Ch. 6
- Regional integration versus multilateralism—Ch. 8
- Will the euro survive?—Ch. 8

■ TURBULENCE IN THE GLOBAL FINANCIAL SYSTEM

- Foreign currency trading becomes automated—Ch. 11
- Is Trump's trade doctrine misguided?—Ch. 10
- Germany's current account surplus—Ch. 10
- The sinking of Russia's ruble—Ch. 14
- Swiss franc soars after exchange rate peg scrapped—Ch. 14
- Reserve currency burdens for the United States—Ch. 11
- Foreign exchange market rigging—Ch. 12
- Exchange rate misalignments—Ch. 12
- Does currency depreciation stimulate exports?—Ch. 14
- Currency carry trade—Ch. 11
- China announces currency independence—Ch. 15
- People's Bank of China punishes speculators—Ch. 11
- Currency manipulation and currency wars—Ch. 14
- Paradox of foreign debt: How the United States borrows at low cost—Ch. 10
- Why a dollar depreciation may not close the U.S. trade deficit—Ch. 13
- Japanese firms send work abroad as yen makes its products less competitive—Ch.13
- Preventing currency crises: Currency boards versus dollarization—Ch. 14

ORGANIZATIONAL FRAMEWORK: EXPLORING FURTHER SECTIONS

Although instructors generally agree on the basic content of the international economics course, opinions vary widely about what arrangement of material is appropriate. This book is structured to provide considerable organizational flexibility. The topic of international trade relations is presented before international monetary relations, but the order can be reversed by instructors choosing to start with monetary theory. Instructors can begin with Chapters 10–15 and conclude with Chapters 2–9. Those who do not wish to cover all the material in the book can easily omit all or parts of Chapters 6–9 and Chapters 14–15 without loss of continuity.

The seventeenth edition streamlines its presentation of theory to provide greater flexibility for instructors. This edition uses online *Exploring Further* sections to discuss more advanced topics. By locating the *Exploring Further* sections within

MindTap rather than in the printed textbook, more textbook coverage can be devoted to contemporary applications of theory. The *Exploring Further* sections consist of the following:

- Comparative advantage in money terms—Ch. 2
- Indifference curves and trade—Ch. 2
- Offer curves and the equilibrium terms of trade—Ch. 2
- The specific-factors theory—Ch. 3
- Offer curves and tariffs—Ch. 4
- Trump’s American First Program: Steel and Aluminum Tariffs—Ch. 4
- Tariff-rate quota welfare effects—Ch. 5
- Export quota welfare effects—Ch. 5
- Welfare effects of strategic trade policy—Ch. 6
- Government procurement policy and the European Union—Ch. 8
- Economies of scale and NAFTA—Ch. 8
- Techniques of foreign-exchange market speculation—Ch. 11
- A primer on foreign-exchange trading—Ch. 11
- Fundamental forecasting—regression analysis—Ch. 12
- Mechanisms of International Adjustment—Ch. 13
- Exchange rate pass-through—Ch. 13
- International Banking: Reserves, Debt, and Risk—Ch. 15

REPOSITIONING OF TWO CHAPTERS

The sixteenth edition of *International Economics* included Chapter 13 (“Mechanisms of International Adjustment”) and Chapter 17 (“International Banking: Reserves, Debt, and Risk”). In order to most effectively streamline the content of the seventeenth edition, these chapters have been repositioned as part of the *Exploring Further* sections that are discussed in the previous section of this preface.

SUPPLEMENTARY MATERIALS

MindTap: Empower Your Students MindTap is a platform that propels students from memorization to mastery. It gives you complete control of your course, so you can provide engaging content, challenge every learner, and build student confidence. Customize interactive syllabi to emphasize priority topics, then add your own material or notes to the eBook as desired. This outcomes-driven application gives you the tools needed to empower students and boost both understanding and performance.

Access Everything You Need in One Place Cut down on prep with the preloaded and organized MindTap course materials. Teach more efficiently with interactive multimedia, assignments, quizzes, and more. Give your students the power to read, listen, and study on their phones, so they can learn on their terms.

Empower Students to Reach Their Potential Twelve distinct metrics give you actionable insights into student engagement. Identify topics troubling your entire class and instantly communicate with those struggling. Students can track their scores to stay motivated toward their goals. Together, you can be unstoppable.

Control Your Course—and Your Content Get the flexibility to reorder textbook chapters, add your own notes, and embed a variety of content including Open Educational Resources (OER). Personalize course content to your students' needs. They can even read your notes, add their own, and highlight key text to aid their learning.

Get a Dedicated Team, Whenever You Need Them MindTap isn't just a tool, it's backed by a personalized team eager to support you. We can help set up your course and tailor it to your specific objectives, so you'll be ready to make an impact from day one. Know we'll be standing by to help you and your students until the final day of the term.

PowerPoint Slides The seventeenth edition also includes updated PowerPoint slides. These slides can be easily downloaded from the instructor's companion website (<http://login.cengage.com>).

Instructor's Manual To assist instructors in the teaching of international economics, there is an *Instructor's Manual* that accompanies the seventeenth edition. The manual contains brief answers to the end-of-chapter study questions and is available for download from the instructor's companion website (<http://login.cengage.com>).

Test Bank The test bank provides items for instructors' reference and use. It contains a variety of question formats in varying levels of difficulty. Cognero® software makes test preparation, scoring, and grading easy. Featuring automatic grading, Cognero® allows you to create, deliver, and customize tests and study guides (both print and online) in minutes.

Compose Compose is the home of Cengage's online digital content. Compose provides the fastest, easiest way for you to create your own learning materials. Contact your Cengage sales representative for more information.

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I would appreciate any comments, corrections, or suggestions that faculty or students wish to make so I can continue to improve this text in the years ahead. Please contact me! Thank you for permitting this text to evolve to the seventeenth edition.

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About the Author



When students take my economics courses at Central Washington University, on the first day of class I ask them to stand up, go around the classroom, and meet all of the other students in the class. I feel that we are a community of learners and that getting to know each other is very important. So allow me to tell you a little about myself and how I became the author of *International Economics*.

I was born in the year that the famous British economist, John Maynard Keynes died (you can look it up if you wish). I proudly remind my fellow economists that this allows me to be the successor of Keynes, and that since that time all great ideas come from me. However, I can't figure out why they are not impressed with my conclusion—to me, it seems obvious. But it should be noted that I was born without much hair, and I maintain this characteristic even today.

Growing up in Spokane, Washington, I came from a family of Mom & Dad and five brothers and sisters. We lived in a modest three-bedroom house with one bathroom and bunk beds for the kids. It was at this time that I first learned about productivity in terms of not tying up the bathroom. Also, I enthusiastically played baseball from little-league through high school. I was a pitcher who threw a fastball (it wasn't that fast), a roundhouse curveball, and a change-up. Being able to hit for a high percentage, I played left field while not pitching. I also played club hockey, competed in local golf tournaments, and eventually got into running 10K races.

As for music, 1950s rock was fun. Looking back in life, I wish that I had learned to play a saxophone so I could have played in a Fifties rock band. However, the folk music of the late 1950s and 1960s had the biggest musical influence on my life, and it still does. Without musical background, my friends and I bought cheap guitars and we learned how to play folk songs while listening to 33 1/3 LPs (not CDs) by groups such as the Kingston Trio, Brothers Four, and New Christy Minstrels. One of my friends became the banjo player with the Brothers Four which still makes CDs and plays at concerts worldwide.

By the time I went to Gonzaga University, I was becoming quite serious about my education, and I enjoyed being challenged by my professors and fellow students. To help finance my college education, I worked at many part-time jobs: I washed dishes at the student dining hall, pumped gas and performed mechanical work at gasoline stations, stocked bottles of liquor on the shelves of the Garland Liquor Store, drove a delivery truck with cement blocks for the Spokane Block Co, bailed hay for farmers, and so on. These were learning experiences. In 1969 I graduated from Gonzaga with a bachelor's degree in economics and a minor in philosophy/theology. It was at this time that I met my wife, Cathy—we now have four daughters and nine grandchildren.

While attending Lewis and Clark High School, I thought about becoming a high-school social studies teacher. But along came economics classes at Gonzaga and I found a college major that I was very excited about. During my junior year, one of my professors had to miss two of his principles of economics classes. After my pleading with him, he allowed me to be his substitute teacher, and I presented lectures dealing with supply and demand. A “light bulb” turned on in my head, and I knew what career I wanted to pursue—a college economics professor. But this required getting an advanced degree in economics. So off I went to Colorado State University where I combined graduate education with a great outdoors environment. In the high altitude of Fort Collins, Colorado (5,003 feet above sea level), I could drive a golf ball a long way. I received my Ph.D. in economics in 1974.

My first college teaching job was at South Dakota State University in 1974 where I learned a lot about growing corn. This was followed by my teaching for ten years at University of Wisconsin–Eau Claire where I learned about the Green Bay Packers, brats and cheese, minus 40 degree winters, and humid summers. I returned to my home state of Washington in 1985 to teach at Central Washington University. Two memorable experiences include being featured on *Saturday Night Live* in 2000, when an actor impersonating Al Gore read from my *International Economics* textbook, and lecturing at Oxford University in England in 2004.

Concerning my *International Economics* textbook, I have not matched the success of J.K. Rowling and her *Harry Potter* books—Rowling’s magic is much better than mine. Yet I identify with some of her early experiences as an author, and perhaps the experiences of other authors. Aside from the difficulty in finding a house that was willing to publish our books, we had to learn how to deal with editors, marketing staff, and the business aspects of publishing. Success did not occur instantly and it was not easy.

My writing *International Economics* was motivated by my former students at the University of Wisconsin–Eau Claire in 1975. When I asked them what they hoped to get out of my international economics class, they indicated that they wanted to learn about the burning international economic issues at that time and that the materials used in the class should be concise, timely, and informative. Therefore, I set out to write the manuscript for *International Economics* long hand on a yellow writing pad (there were no computers at that time). Then I typed the manuscript using an ancient, black-colored Underwood typewriter with no self-correct mechanism. When a typing error occurred, I brushed white-colored Liquid Paper over the typo; I had to wait for it to dry before typing the correct key. Ugh, what an effort! But life seemed good at that time, particularly because I thought that I was on the cutting edge. This resulted in the first edition of *International Economics* appearing in 1980. Since that time, I have been most fortunate to have many opportunities to revise and improve this text, resulting in the current seventeenth edition. It has been a long journey but also a labor of love. I hope that you find this edition to be interesting and user friendly. Best wishes.

Bob Carbaugh

P.S. My students have mistakenly identified me as driving a Hummer around Central Washington University. Rather than driving a Hummer, I usually walk or ride a single-speed, imported Schwinn bike (Schwinns are now manufactured in China) to and from my office. When I do drive, it is usually in a rapidly deteriorating 1997 Dodge Caravan—something appropriate for an aging and cranky economics professor.

The International Economy and Globalization



In today's world, no nation exists in economic isolation. All aspects of a nation's economy—its industries, service sectors, levels of income and employment, and living standard—are linked to the economies of its trading partners. This linkage takes the form of international movements of goods and services, labor, business enterprise, investment funds, and technology. Indeed, national economic policies cannot be formulated without evaluating their probable impacts on the economies of other countries.

The high degree of **economic interdependence** among today's economies reflects the historical evolution of the world's economic and political order. At the end of World War II, the United States was economically and politically the most powerful nation in the world, a situation expressed in the saying, "When the United States sneezes, the economies of other nations catch a cold." But with the passage of time, the U.S. economy has become increasingly integrated into the economic activities of foreign countries. The formation in the 1950s of the European Community (now known as the European Union), the rising importance in the 1960s of multinational corporations, the market power in the 1970s enjoyed by the Organization of Petroleum Exporting Countries (OPEC), the creation of the euro at the turn of the twenty-first century, and the rise of China as an economic power in the early 2000s have all resulted in the evolution of the world community into a complicated system based on a growing interdependence among nations.

The Great Recession of 2007–2009 provides an example of economic interdependence. The immediate cause of the recession was a collapse of the U.S. housing market and the resulting surge in mortgage loan defaults. Hundreds of billions of dollars in losses on these mortgages undermined the financial institutions that originated and invested in them. Credit markets froze, banks would not lend to each other, and businesses and households could not get loans needed to finance day-to-day operations. This shoved the economy into recession. Soon the crisis spread to Europe whose banks were drawn into the financial crisis in part because of their exposure to defaulted mortgages in the United States. As these

banks had to write off losses, fear and uncertainty spread regarding whether banks had enough capital to pay off their debt obligations. The financial crisis also spread to emerging economies such as Iceland and Russia that generally lacked the resources to restore confidence in their economic systems. It is no wonder that “when the United States sneezed, other economies caught a cold.”

Recognizing that world economic interdependence is complex and its effects uneven, the economic community has taken steps toward international cooperation. Conferences devoted to global economic issues have explored the avenues through which cooperation could be fostered between industrial and developing nations. The efforts of developing nations to reap larger gains from international trade and to participate more fully in international institutions have been hastened by the impact of the global recession, industrial inflation, and the burdens of high-priced energy.

Over the past 50 years, the world’s market economies have become increasingly interdependent. Exports and imports as a share of national output have risen for most industrial nations, while foreign investment and international lending have expanded. This closer linkage of economies can be mutually advantageous for trading nations. This link permits producers in each nation to take advantage of the specialization and efficiencies of large-scale production. A nation can consume a wider variety of products at a cost less than what could be achieved in the absence of trade. Despite these advantages, demands have grown for protection against imports. Protectionist pressures have been strongest during periods of rising unemployment caused by economic recession. Moreover, developing nations often maintain that the so-called liberalized trading system called for by industrial nations serves to keep the developing nations in poverty.

Economic interdependence also has direct consequences for a student taking an introductory course in international economics. As consumers, we can be affected by changes in the international values of currencies. Should the Japanese yen or British pound appreciate against the U.S. dollar, it would cost us more to purchase Japanese television sets or British automobiles. As investors, we might prefer to purchase Swiss securities if Swiss interest rates rise above U.S. levels. As members of the labor force, we might want to know whether the president plans to protect U.S. steelworkers and autoworkers from foreign competition.

In short, economic interdependence has become a complex issue in recent times, often resulting in strong and uneven impacts among nations and among sectors within a given nation. Business, labor, investors, and consumers all feel the repercussions of changing economic conditions and trade policies in other nations. Today’s global economy requires cooperation on an international level to cope with the myriad issues and problems.

Economic Interdependence: Federal Reserve Policy Incites Global Backlash

Economic interdependence is part of our daily lives. When domestic economic policies have spillover effects on the economies of other countries, policymakers must take these into account. This is why major countries frequently meet to discuss the impacts of their policies on the world economy. Consider the effects of the Federal Reserve’s policies on other economies, as discussed below.

For decades, the Federal Reserve (Fed) has attempted to fulfill its mandate to promote full employment, price stability, and economic growth for the U.S. economy. Pursuing these objectives can impose adverse spillover effects on economies of other nations, as seen in the following example.

In response to the Great Recession of 2007–2009, the Fed attempted to grow the U.S. economy by purchasing large amounts of long-term securities; this policy was called quantitative easing. The idea was to pump additional money into the economy that would cause long-term interest rates to fall. This would encourage Americans to spend more on investment and big ticket consumption items, thus stimulating the economy. However, critics doubted that the program would work and maintained that it might cause an increase in inflationary expectations that could destabilize the economy.

Also, the Fed's program was criticized by U.S. trading partners such as Germany and Brazil, as an attempt to improve American competitiveness at their expense. They noted that printing more dollars or cutting U.S. interest tends to cause depreciation in the dollar's exchange value, which will be explained in Chapter 11 of this text. If the value of the dollar decreases, other countries' exports become more expensive for American consumers, thus reducing the amount of goods the United States imports from the rest of the world. The accompanying rise in the exchange value of other countries' currencies makes American goods cheaper for foreign consumers to purchase, which should increase the amount of exports leaving the United States. This would benefit U.S. producers, who would likely increase hiring to meet the increased production requirements of the increased global demand for their exports. What's more, the rest of the world's producers would see their exports fall, resulting in job losses for their workers. Producers in the United States would gain at the expense of producers abroad.

However, Federal Reserve officials challenged this argument by stating that the purpose of their program was not to push down the dollar in order to disadvantage America's trading partners. Instead, it was an attempt to grow the economy, which is not just good for the United States, but for the world as a whole. A depreciation of the dollar was only a side effect of a growth-oriented policy, not the purpose of the policy. This argument did not dampen the fears of foreigners regarding the Fed's monetary policy, and their criticism continued.

Globalization of Economic Activity

When listening to the news, we often hear about globalization. What does this term mean? **Globalization** is the process of greater interdependence among countries and their citizens. It consists of the increased interaction of product and resource markets across nations via trade, immigration, and foreign investment—that is, via international flows of goods and services, people, and investments in equipment, factories, stocks, and bonds. It also includes noneconomic elements such as culture and the environment. Simply put, globalization is political, technological, and cultural, as well as economic.

In terms of people's daily lives, globalization means that the residents of one country are more likely now than they were 50 years ago to consume the products of another country, invest in another country, earn income from other countries, talk by telephone to people in other countries, visit other countries, know that they are being affected by economic developments in other countries, and know about developments in other countries.

What forces are driving globalization?¹ The first, and perhaps most profound, influence is technological change. Since the Industrial Revolution of the late 1700s, technical innovations have led to an explosion in productivity and slashed transportation costs. The steam engine preceded the arrival of railways and the mechanization of a growing number of activities hitherto reliant on muscle power. Later discoveries and inventions such as

¹World Trade Organization, *Annual Report*, 1998, pp. 33–36.

electricity, the telephone, the automobile, container ships, and pipelines altered production, communication, and transportation in ways unimagined by earlier generations. More recently, rapid developments in computer information and communications technology have further shrunk the influence of time and geography on the capacity of individuals and enterprises to interact and transact around the world. For services, the rise of the Internet has been a major factor in falling communication costs and increased trade. As technical progress has extended the scope of what can be produced and where it can be produced, and advances in transport technology have continued to bring people and enterprises closer together, the boundary of tradable goods and services has been greatly extended.

Also, continuing liberalization of trade and investment has resulted from multilateral trade negotiations. For example, tariffs in industrial countries have come down from high double digits in the 1940s to about 4 percent by 2018. At the same time, most quotas on trade, except for those imposed for health, safety, or other public policy reasons, have been removed. Globalization has also been promoted through the widespread liberalization of investment transactions and the development of international financial markets. These factors have facilitated international trade through the greater availability and affordability of financing.

Lower trade barriers and financial liberalization have allowed more companies to globalize production structures through investment abroad, which in turn has provided a further stimulus to trade. On the technology side, increased information flows and the greater tradability of goods and services have profoundly influenced production location decisions. Businesses are increasingly able to locate different components of their production processes in various countries and regions and still maintain a single corporate identity. As firms subcontract part of their production processes to their affiliates or other enterprises abroad, they transfer jobs, technologies, capital, and skills around the globe.

INTERNATIONAL TRADE APPLICATION

U.S. Apple Growers Not Overly Worried about Chinese Imports

The year 2015 was an historic one for U.S. apple growers. China agreed to accept all varieties of America's apples, while U.S. officials moved toward accepting China's apples in return. However, the opening of apple trade between the two countries was not viewed as much of a threat by most of America's growers who were confident that the United States would sell more than it purchases. U.S. growers noted that Chinese apples have not sold heavily in Canada and Europe, which is a good indicator they will not be major competition in the United States.

China produces about 1.9 billion 40-pound boxes of apples annually, amounting to about half of the world's consumption. American apple growers rank second, producing about 249 million boxes per year. Much of that production, about 60–70 percent, comes from the central part of Washington state.



Comparing American and Chinese apples, the United States produces dozens of varieties, such as Red Delicious and Golden Delicious, while China has mainly Fujis. Also, the United States has a competitive advantage in technology and infrastructure, such as high-volume packing lines with computers, light spectrometers, and near-infrared cameras that scan and sort apples. Asian importing companies expect flawless apples, and America's packing houses have met that challenge.

However, China's apples are often associated with the stigma of low quality and poor safety, due to rot and pests. Also, China's growing costs have increased, and export prices to foreign markets have followed suit. Simply put, China's Fujis are rather expensive: Chinese consumers pay more for their Fujis than U.S. consumers pay for American Fujis.

(continued)

China first asked the United States to open its ports to Chinese apples in the 1990s. But U.S. health officials were concerned about diseases and pests that could come with the imports. By 2015, they concluded that China had addressed those threats, and thus the apple trade agreement occurred.

However, not all American growers agreed with the U.S. government's policy of opening its ports to China's apples. They did not trust China's food safety regulations or the U.S. government's import inspections, fearing that apples tainted with arsenic would slip through the cracks and onto America's store shelves. They also feared that China might play politics with food safety and plant health; they could conveniently find a bug, and by the time it was resolved, it could take several years to address, to the disadvantage of America's growers. This

occurred in 2012 when China's government suspended imports of Red and Golden Delicious apples from the U.S. state of Washington on the grounds that these apples posed pest and disease threats to China's growers. But Washington growers suspected that the real reason the market closed was to put pressure on the U.S. government to reach an apple trade agreement with China, which came about in 2015.

What do you think? Did American apple growers view imported apples from China to be a threat to their livelihood?

Sources: Amy Nordrum, "China Welcomes U.S. Apple Imports: Should Boost Apple Growers," *International Business Times*, January 27, 2015; Dan Wheat, "U.S., China Open Doors to Apple Trade," *Capital Press*, January 26, 2015; Ross Courtney, "No Looming Battle: Domestic Apple Industry Officials Aren't Too Concerned about Chinese Imports," *Yakima Herald Republic*, February 16, 2015.

Waves of Globalization

In recent decades, there has been pronounced global economic interdependence. Economic interdependence occurs through trade, labor migration, and capital (investment) flows such as corporation stocks and government securities.

The history of globalization is related to the evolution of trade. Centuries ago, when transportation was difficult, international trade was limited to the most expensive items such as silk or spices. With the industrial revolution in the late 1700s and 1800s, mass production and improved transportation made international trade much easier, and most goods became tradable. The Industrial Revolution saw the rise of large industries, with workers performing specialized tasks and increasingly supplanting traditional craftsmen. Huge factories were established that could serve distant markets, thanks to a new network of railways, intercity roads, and ocean freight. By the 1990s, a new phenomenon, known as global manufacturing, was again increasing the volume and diversity of products being traded. Global manufacturing is characterized by the geographical fragmentation of productive processes and the offshoring of industrial tasks. Trade in intermediate goods, such as parts and components, has encouraged the specialization of different economies, resulting in a trade in tasks that adds value along the production chain. Specialization is no longer founded on the comparative advantage of countries in producing a final good, but on the comparative advantage of tasks that these countries complete at a specific step along the global value chain. Let us consider the major waves of globalization that have occurred in recent history.²

First Wave of Globalization: 1870–1914

The first wave of global interdependence occurred from 1870 to 1914. The interdependence was sparked by decreases in tariff barriers and new technologies that resulted in declining transportation costs, such as the shift from sail to steamships and the advent of railways.

²This section draws from World Bank, *Globalization, Growth and Poverty: Building an Inclusive World Economy*, 2001.

The main agent that drove the process of globalization was how much muscle, horsepower, wind power, or later on, steam power a country had and how creatively it could deploy that power. This wave of globalization was largely driven by European and American businesses and individuals. Therefore, exports as a share of world income nearly doubled to about 8 percent, while per capita incomes, which had risen by 0.5 percent per year in the previous 50 years, rose by an annual average of 1.3 percent. The countries that actively participated in globalization, such as the United States, became the richest countries in the world.

However, the first wave of globalization was brought to an end by World War I. Also, during the Great Depression of the 1930s, governments responded by practicing protectionism: a futile attempt to enact tariffs on imports to shift demand into their domestic markets, thus promoting sales for domestic companies and jobs for domestic workers. For the world economy, increasing protectionism caused exports as a share of national income to fall to about 5 percent, thereby undoing 80 years of technological progress in transportation.

Second Wave of Globalization: 1945–1980

The horrors of the retreat into nationalism provided renewed incentive for internationalism following World War II. The result was a second wave of globalization that took place from 1945 to 1980. Falling transportation costs continued to foster increased trade. Nations persuaded governments to cooperate to decrease previously established trade barriers.

However, trade liberalization discriminated both in terms of which countries participated and which products were included. By 1980, trade between developed countries in manufactured goods had been largely freed of barriers. Barriers facing developing countries had been eliminated for only those agricultural products that did not compete with agriculture in developed countries. For manufactured goods, developing countries faced sizable barriers. For developed countries, the slashing of trade barriers between them greatly increased the exchange of manufactured goods, thus helping to raise the incomes of developed countries relative to the rest.

The second wave of globalization introduced a new kind of trade: rich country specialization in manufacturing niches that gained productivity through **agglomeration economies**. Increasingly, firms clustered together; some clusters produced the same product, and others were connected by vertical linkages. Japanese auto companies, for example, became famous for insisting that their parts manufacturers locate within a short distance of the main assembly plant. For companies such as Toyota and Honda, this decision decreased the costs of transport, coordination, monitoring, and contracting. Although agglomeration economies benefit those in the clusters, they are bad news for those who are left out. A region can be uncompetitive simply because not enough firms have chosen to locate there. Thus, a divided world can emerge, in which a network of manufacturing firms is clustered in some high-wage region, while wages in the remaining regions stay low. Firms will not shift to a new location until the discrepancy in production costs becomes sufficiently large to compensate for the loss of agglomeration economies.

During the second wave of globalization, most developing countries did not participate in the growth of global trade in manufacturing and services. The combination of continuing trade barriers in developed countries and unfavorable investment climates and antitrade policies in developing countries confined them to dependence on agricultural and natural resource products.

Although the second globalization wave succeeded in increasing per capita incomes within the developed countries, developing countries as a group were being left behind. World inequality fueled the developing countries' distrust of the existing international trading system that seemed to favor developed countries. Therefore, developing countries

became increasingly vocal in their desire to be granted better access to developed country markets for manufactured goods and services, thus fostering additional jobs and rising incomes for their people.

Latest Wave of Globalization

The latest wave of globalization that began in about 1980 is distinctive. First, a large number of developing countries, such as China, India, and Brazil, broke into the world markets for manufacturers. Second, other developing countries became increasingly marginalized in the world economy and realized decreasing incomes and increasing poverty. Third, international capital movements, which were modest during the second wave of globalization, again became significant.

Of major significance for this wave of globalization is that some developing countries succeeded for the first time in harnessing their labor abundance to provide them with a competitive advantage in labor-intensive manufacturing. Examples of developing countries that have shifted into manufacturing trade include Bangladesh, Malaysia, Turkey, Mexico, Hungary, Indonesia, Sri Lanka, Thailand, and the Philippines. This shift is partly because of tariff cuts that developed countries have made on imports of manufactured goods. Also, many developing countries liberalized barriers to foreign investment that encouraged firms such as Ford Motor Company to locate assembly plants within their borders. Moreover, technological progress in transportation and communications permitted developing countries to participate in international production networks. However, the dramatic increase in manufactured exports from developing countries has contributed to protectionist policies in developed countries. With so many developing countries emerging as important trading countries, reaching further agreements on multilateral trade liberalization has become more complicated.

Another aspect of the most recent wave of globalization is foreign outsourcing, when certain aspects of a product's manufacture are performed in more than one country. As travel and communication became easier in the 1970s and 1980s, manufacturing increasingly moved to wherever costs were the lowest. U.S. companies shifted the assembly of autos and the production of shoes, electronics, and toys to low-wage developing countries. This shift resulted in job losses for blue-collar workers producing these goods and cries for the passage of laws to restrict outsourcing.

When an American customer places an order online for a Hewlett-Packard (HP) laptop, the order is transmitted to Quanta Computer Inc. in Taiwan. To reduce labor costs, the company farms out production to workers in Shanghai, China. They combine parts from all over the world to assemble the laptop that is flown as freight to the United States, and then sent to the customer. About 95 percent of the HP laptop is outsourced to other countries. The outsourcing ratio is close to 100 percent for other U.S. computer producers including Dell, Apple, and Gateway.

By the 2000s, the information-technology revolution resulted in the foreign outsourcing of white-collar work. Today, many companies' locations hardly matter. Work is connected through the Internet, and high-speed data networks around the world. Companies can now send office work anywhere, including places like India, Ireland, and the Philippines, where workers are paid much less than American workers. The latest wave of globalization is sending upscale jobs offshore, including accounting, chip design, engineering, basic research, and financial analysis. Also, digitalization has resulted in platforms, like eBay and Amazon, which enable small companies and even individual entrepreneurs to participate in the global economy. Digital platforms are connecting the world's companies and customers, suppliers and companies, talent and jobs, and entrepreneurs and funding—and in ways that were not possible years ago.

Simply put, the integrated factory floor, which had dominated manufacturing since the 1800s, has increasingly been replaced by a network of individual suppliers specializing in specific services or phases of production that are spread around the globe. Countries no longer export only finished products, but tend to specialize in specific stages of the production process.

The Boeing 787 Dreamliner provides an example of trade occurring between the different participants of a production chain. For its entire history, Boeing has guarded its techniques for designing and mass producing commercial jetliner wings. Also, final assembly of the 787 occurs at Boeing's plants in Seattle, Washington and Charleston, South Carolina. For economic reasons, Boeing subcontracts the production of parts and components to various American and foreign producers. Here are some examples of the global production network of the 787's components.

Passenger doors—France	Forward fuselage—Japan, United States
Landing gear—France	Lavatories—Japan
Cargo doors—Sweden	Flight deck seats—United Kingdom
Raked wing tips—South Korea	Escape slides—United States
Center fuselage—Italy	Vertical stabilizer—United States
Tires—Japan	Horizontal stabilizer—Italy
Wing fairing—Canada	Moveable trailing edge—Australia

As for Airbus, Boeing's competitor based in Toulouse, France, its jetliners are built mostly in Europe. Suppliers in France, Germany, Spain, and the United Kingdom build most of the parts that are included in Airbus jetliners. However, some of the Airbus engines are produced in the United States, in locations including Raleigh, North Carolina, Middletown, Connecticut, West Palm Beach, Florida, and Lafayette, Indiana. Airbus has final assembly lines for its jetliners in France, Germany, China, and the United States (Mobile, Alabama).

However, during the Great Recession of 2007–2009 and its aftermath, the tide of globalization has receded. Not only did global trade decline during the Great Recession, but it barely grew when compared with overall economic output during 2010–2018. Also, cross-border bank lending was down sharply, as were international capital flows. Moreover, immigration in the United States and Western Europe witnessed a deepening public backlash. Finally, nationalist policies were on the rise as seen in the United Kingdom's proceedings to remove itself from the European Union and the United States' pulling out of the proposed Trans-Pacific Partnership on President Donald Trump's first day in the Oval Office in 2017.

For traditional economists, globalization is a pathway to prosperity. This optimism is rooted in the works of the British economists, Adam Smith in 1776 and David Ricardo in 1817, who maintained that trade is the basis for wealth because it makes countries more efficient by allowing each to specialize at what its workers do best. However, the downside of globalization in a modern economy was becoming increasingly apparent by the 2000s. The linking of disparate nations economically resulted in an increase in the world labor pool, pitting workers in wealthy nations against poorly paid ones in developing nations. Although that increased the incomes of the world's poor, it created a backlash in Europe and the United States. At the same time, the liberalization of financial flows led to financial excesses that resulted in the Great Recession of 2007–2009. Since that time globalization has been on the defensive. More will be said about this in future chapters of this text.

INTERNATIONAL TRADE APPLICATION

Diesel Engines and Gas Turbines as Movers of Globalization

When you consider internal combustion engines, you probably think about the one under the hood of your car or truck, the gasoline-powered engine. Although this engine is good for moving you around, it is not adequate for moving large quantities of goods and people long distances; global transportation requires more massive engines.

What makes it possible for us to transport billions of tons of raw materials and manufactured goods from country to country? Why are we able to fly almost anywhere in the world in a Boeing or Airbus jetliner within 24 hours? Two notable technical innovations that have driven globalization are diesel engines, which power cargo ships, locomotives, and large trucks, and natural gas-fired turbines that power planes and other means of transportation.

The diesel engine was first developed to the point of commercial success by Rudolf Diesel in the 1890s. After graduating from Munich Polytechnic in Germany, Diesel became a refrigerator engineer, but his true love lay in engine design. He developed an engine that converted the chemical energy available in diesel fuel into mechanical energy that could power trucks, cargo ships, and so on. Today, more than 90 percent of global trade in manufactured goods and raw materials is transported with the use of diesel engines.

The natural gas-fired turbine is another driver of globalization. A gas turbine is a rotary engine that extracts



energy from a flow of combustion gas. This energy produces a power thrust that sends an airplane into the sky. It also turns a shaft or a propeller that moves locomotives and ships. The gas turbine was invented by Frank Whittle, a British engineer, in the early 1900s. Although Wilbur and Orville Wright are the first fathers of flight, Whittle's influence on global air travel should not be underestimated.

These two engines, diesels and turbines, have become important movers of goods and people throughout the world. They have reduced transportation costs to such an extent that distance to the market is a much smaller factor affecting the location of manufacturers or the selection of the origin of imported raw materials. Indeed, neither international trade nor intercontinental flights would have realized such levels of speed, reliability, and affordability as have been achieved had it not been for diesel engines and gas turbines. Although diesels and turbines have caused environmental problems, such as air and water pollution, these machines will likely not disappear soon.

What do you think? How did diesel engines and gas turbines promote international trade among nations?

Sources: Vaclav Smil, *Prime Movers of Globalization*, MIT Press, Cambridge, Massachusetts, 2010; and Nick Schulz, "Engines of Commerce," *The Wall Street Journal*, December 1, 2010.

The United States as an Open Economy

It is generally agreed that the U.S. economy has become increasingly integrated into the world economy (become an open economy) in recent decades. Such integration involves a number of dimensions that include the trade of goods and services, financial markets, the labor force, ownership of production facilities, and the dependence on imported materials.

Trade Patterns

To appreciate the globalization of the U.S. economy, go to a local supermarket. Almost any supermarket doubles as an international food bazaar. Alongside potatoes from Idaho and beef from Texas, stores display melons from Mexico, olive oil from Italy, coffee from Colombia, cinnamon from Sri Lanka, wine and cheese from France, and bananas from Costa Rica. Table 1.1 shows a global fruit basket that is available for American consumers.

TABLE 1.1

The Fruits of Free Trade: A Global Fruit Basket

On a trip to the grocery store, consumers can find goods from all over the globe.

Fruit	Country	Fruit	Country
Apples	New Zealand	Limes	El Salvador
Apricots	China	Oranges	Australia
Bananas	Ecuador	Pears	South Korea
Blackberries	Canada	Pineapples	Costa Rica
Blueberries	Chile	Plums	Guatemala
Coconuts	Philippines	Raspberries	Mexico
Grapefruit	Bahamas	Strawberries	Poland
Grapes	Peru	Tangerines	South Africa
Kiwifruit	Italy	Watermelons	Honduras
Lemons	Argentina		

Source: From "The Fruits of Free Trade," *Annual Report*, Federal Reserve Bank of Dallas, 2002, p. 3.

The grocery store isn't the only place Americans indulge their taste for foreign-made products. We buy cameras and cars from Japan, shirts from Bangladesh, DVD players from South Korea, paper products from Canada, and fresh flowers from Ecuador. We get oil from Kuwait, steel from China, computer programs from India, and semiconductors from Taiwan. Most Americans are well aware of our desire to import, but they may not realize that the United States ranks as the world's greatest exporter by selling personal computers, bulldozers, jetliners, financial services, movies, and thousands of other products to just about all parts of the globe. International trade and investment are facts of everyday life.

As a rough measure of the importance of international trade in a nation's economy, we can look at that nation's exports and imports as a percentage of its gross domestic product (GDP). This ratio is known as **openness**.

$$\text{Openness} = \frac{(\text{Exports} + \text{Imports})}{\text{GDP}}$$

Table 1.2 shows measures of openness for selected nations as of 2015. In that year, the United States exported 13 percent of its GDP while imports were 15 percent of GDP; the openness of the U.S. economy to trade equaled 28 percent. Although the U.S. economy is significantly tied to international trade, this tendency is even more striking for many smaller nations, as shown in the table. Large countries tend to be less reliant on international trade because many of their companies can attain an optimal production size without having to export to foreign nations. Therefore, small countries tend to have higher measures of openness than do large ones.

What has been the trend of the openness of the U.S. economy from 1890 to 2018? One significant trend is that the United States became less open to international trade between 1890 and 1950. Openness was relatively high in the late 1800s because of the rise in world trade resulting from technological improvements in transportation (steamships) and communications (trans-Atlantic telegraph cable). However, two world wars and the Great Depression of the 1930s caused the United States to reduce its dependence on trade, partly for national security reasons and partly to protect its home industries from import competition. Following World War II, the United States and other countries negotiated reductions in trade barriers that contributed to rising world trade. Technological improvements in shipping and communications also bolstered trade and the increasing openness of the U.S. economy.

TABLE 1.2**Exports and Imports of Goods and Services as a Percentage of Gross Domestic Product (GDP), 2015**

Country	Exports as a Percentage of GDP	Imports as a Percentage of GDP	Exports Plus Imports as a Percentage of GDP
Netherlands	83	72	155
Germany	47	39	86
Canada	32	34	66
United Kingdom	27	29	56
China	22	19	41
Japan	18	18	36
United States	13	15	28

Source: From The World Bank Group, *World Development Indicators: Data Bank*, 2017, available at <http://www.worldbank.org>.

The relative importance of international trade for the United States has significantly increased during the past century. For example, the U.S. openness ratio increased from about 15 percent in 1890 to over 30 percent in 1918. But a fact is hidden by these data. In 1890, most U.S. trade was in raw materials and agricultural products, whereas today, manufactured goods and services dominate U.S. trade flows. Therefore, American producers of manufactured products are more affected by foreign competition than they were a hundred years ago.

The significance of international trade for the U.S. economy is even more noticeable when specific products are considered. We would have fewer personal computers without imported components, no aluminum if we did not import bauxite, no tin cans without imported tin, and no chrome bumpers if we did not import chromium. Students taking a 9 A.M. course in international economics might sleep through the class (do you really believe this?) if we did not import coffee or tea. Moreover, many of the products we buy from foreigners would be more costly if we were dependent on our domestic production.

With which nations does the United States conduct trade? China, Canada, Mexico, and Japan head the list, as shown in Table 1.3.

TABLE 1.3**Top 8 Countries with Whom the United States Trades, 2016**

Country	Value of U.S. Exports of Goods (in billions of dollars)	Value of U.S. Imports of Goods (in billions of dollars)	Total Value of Trade (in billions of dollars)
China	115.8	462.8	578.6
Canada	266.8	278.1	544.9
Mexico	231.0	294.2	525.2
Japan	63.3	132.2	195.5
Germany	49.4	114.2	163.6
United Kingdom	55.4	54.3	109.7
South Korea	42.3	69.9	112.2
France	30.9	46.8	77.7

Source: From U.S. Department of Commerce, U.S. Census Bureau, *Foreign Trade: U.S. Trade in Goods by Country*, 2017.

Labor and Capital

Besides the trade of goods and services, movements in factors of production are a measure of economic interdependence. As nations become more interdependent, labor and capital should move more freely across nations.

However, during the past 100 years, labor mobility has not risen for the United States. In 1900, about 14 percent of the U.S. population was foreign born. But from the 1920s to the 1960s, the United States sharply curtailed immigration. This curtailment resulted in the foreign-born U.S. population declining to 6 percent of the total population. During the 1960s, the United States liberalized restrictions, and the flow of immigrants increased. By 2014, about 12 percent of the U.S. population was foreign born, while foreigners made up about 14 percent of the labor force. People from Latin America accounted for about half of this figure, while Asians accounted for another quarter. These immigrants contributed to economic growth in the United States by taking jobs in labor-scarce regions and filling the types of jobs native workers often shun.

Although labor mobility has not risen for the United States in recent decades, the country has become increasingly tied to the rest of the world through capital (investment) flows. Foreign ownership of U.S. financial assets has risen since the 1960s. During the 1970s, OPEC recycled many of their oil dollars by making investments in U.S. financial markets. The 1980s also witnessed major flows of investment funds to the United States as Japan and other nations, with dollars accumulated from trade surpluses with the United States, acquired U.S. financial assets, businesses, and real estate. By the late 1980s, the United States was consuming more than it produced and became a net borrower from the rest of the world to pay for the difference. Increasing concerns were raised about the interest cost of this debt to the U.S. economy and the impact of this debt burden on the living standards of future U.S. generations. This concern remains at the writing of this book in 2018.

Globalization has also increased in international banking. The average daily volume of trading (turnover) in today's foreign exchange market (where currencies are bought and sold) is estimated at about \$5 trillion, compared to \$205 billion in 1986. The global trading day begins in Tokyo and Sydney and, in a virtually unbroken 24-hour cycle, moves around the world through Singapore and Hong Kong to Europe and finally across the United States before being picked up again in Japan and Australia. London remains the largest center for foreign exchange trading, followed by the United States; significant volumes of currencies are also traded in Asia, Germany, France, Scandinavia, Canada, and elsewhere.

In commercial banking, U.S. banks have developed worldwide branch networks for loans, payments, and foreign exchange trading. Foreign banks have also increased their presence in the United States, reflecting the multinational population base of the United States, the size and importance of U.S. markets, and the role of the U.S. dollar as an international medium of exchange and reserve currency. Today, more than 250 foreign banks operate in the United States; in particular, Japanese banks have been the dominant group of foreign banks operating in the United States.

Like commercial banks, securities firms have also globalized their operations. By the 1980s, U.S. government securities were traded on virtually a 24-hour basis. Foreign investors purchased U.S. treasury bills, notes, and bonds, and many desired to trade during their own working hours rather than those of the United States. Primary dealers of U.S. government securities opened offices in such locations as Tokyo and London. Stock markets became increasingly internationalized with companies listing their stocks on different exchanges throughout the world. Financial futures markets also spread throughout the world.

Why Is Globalization Important?

Since ancient times, international trade has allowed consumers to buy goods that are not produced domestically. Production can be separated from consumption, often by great distances. This notion was discussed by the famous English economist, David Ricardo, in 1817. He observed how Portuguese wine was traded for English cloth. Countries did not have to grow grapes to enjoy wine, Ricardo noted. Thanks to trade, they could transform the cloth they produce into wine.

Ricardo saw that because of trade, individuals, firms, regions, and nations can specialize in the production of things they do well and use the earnings from these activities to purchase from others those items for which they are high-cost producers. Therefore, trading partners can produce a larger joint output and achieve a higher standard of living than would otherwise be possible. Economists refer to this as the law of comparative advantage, which will be further discussed in Chapter 2.

According to the **law of comparative advantage**, the citizens of each nation can gain by spending more of their time and resources doing those things where they have a relative advantage. If a good or service can be obtained more economically through trade, it makes sense to trade for it instead of producing it domestically. It is a mistake to focus on whether a good is going to be produced domestically or abroad. The central issue is how the available resources can be used to obtain each good at the lowest possible cost. When trading partners use more of their time and resources producing things they can produce best, they are able to produce a larger joint output that provides the source for mutual gain.

International trade also results in gains from the competitive process. Competition is essential to both innovation and efficient production. International competition helps keep domestic producers on their toes and provides them with a strong incentive to improve the quality of their products. Also, international trade usually weakens monopolies. As countries open their markets, their monopoly producers face competition from foreign firms.

With globalization and import competition, U.S. prices have decreased for many products like TV sets, toys, dishes, clothing, and so on. However, prices increased for many products untouched by globalization, such as cable TV, hospital services, sports tickets, rent, car repair, and others. The gains from global markets are not restricted to goods traded internationally. They extend to such nontraded goods as houses that contain carpeting, wiring, and other inputs now facing greater international competition.

During the 1950s, General Motors (GM) was responsible for about 60 percent of all passenger cars produced in the United States. Although GM officials praised the firm's immense size for providing economies of scale in individual plant operations, skeptics were concerned about the monopoly power resulting from GM's dominance of the auto market. Some argued that GM should be divided into several independent companies to inject more competition into the market. Today, stiff foreign competition has resulted in GM's current share of the market to stand at about 17 percent.

Not only do open economies have more competition, but they also have more firm turnover. Being exposed to competition around the globe can result in high-cost domestic producers exiting the market. If these firms are less productive than the remaining firms, then their exit represents productivity improvements for the industry. The increase in exits is only part of the adjustment. The other part is new firms entering the market unless there are significant barriers. With these new firms comes more labor market churning as workers formerly employed by obsolete firms must now find jobs in emerging ones. Inadequate education and training can make some workers unemployable for emerging firms creating new jobs that we often cannot yet imagine. This is probably the key reason why workers find

globalization to be controversial. The higher turnover of firms is an important source of the dynamic benefits of globalization. In general, dying firms have falling productivity, and new firms tend to increase their productivity over time.

Economists have generally found that economic growth rates have a close relation to openness to trade, education, and communications infrastructure. Countries that open their economies to international trade tend to benefit from new technologies and other sources of economic growth.

International trade can also provide stability for producers, as seen in the case of Invacare Corporation, an Ohio-based manufacturer of wheelchairs and other health care equipment. For the wheelchairs it sells in Germany, the electronic controllers come from the firm's New Zealand factories; the design is largely American; and the final assembly is done in Germany with parts shipped from the United States, France, and the United Kingdom. By purchasing parts and components worldwide, Invacare can resist suppliers' efforts to increase prices for aluminum, steel, rubber, and other materials. By selling its products in 80 nations, Invacare can maintain a more stable workforce in Ohio than if it was completely dependent on the U.S. market. If sales decline anytime in the United States, Invacare has an ace up its sleeve—exports.

On the other hand, rapid growth in countries like China and India has helped to increase the demand for commodities like crude oil, copper, and steel. Thus, American consumers and companies pay higher prices for items like gasoline. Rising gasoline prices, in turn, have spurred governmental and private sector initiatives to increase the supply of gasoline substitutes like biodiesel or ethanol. Increased demand for these alternative forms of energy has helped to increase the price of soybeans and corn that are key inputs in the production of chicken, pork, beef, and other foodstuffs.

Moreover, globalization can make the domestic economy vulnerable to disturbances initiated overseas, as seen in the case of India. In response to India's agricultural crisis, some 1,200 Indian cotton farmers committed suicide during 2005–2007 to escape debts to money lenders. The farmers borrowed money at exorbitant rates, so they could sink wells and purchase expensive biotech cotton seeds. But the seeds proved inadequate for small plots, resulting in crop failures. Farmers suffered from the low world price of their cotton crop, which fell by more than a third from 1994 to 2007. Prices were low partly because cotton was heavily subsidized by wealthy countries, mainly the United States. According to the World Bank, cotton prices would have risen about 13 percent if the subsidies had been eliminated.

Although India's government could impose a tariff on imported cotton to offset the foreign subsidy, its textile manufacturers, who desired to keep production costs low, welcomed cheap fibers. India's cotton tariff was only 10 percent, much lower than its tariffs on most other commodities.

The simple solution to the problem of India's farmers would be to move them from growing cotton to weaving it in factories. India's restrictive labor laws discouraged industrial employment, and the lack of a safety net resulted in farmers clinging to their marginal plots of land.

There is great irony in the plight of India's cotton farmers. The British developed India's long-fiber cotton in the 1800s to supply British cotton mills. As their inexpensive cloth drove India's weavers out of business, the weavers were forced to work the soil. By the early 2000s, India's textile makers were enjoying a revival, but its farmers could not leave the soil to work in factories.³

³"Cotton Suicides: The Great Unraveling," *The Economist*, January 20, 2007, p. 34.

Globalization and Competition

Although economists recognize that globalization and free trade can provide benefits to many firms, workers, and consumers, they can inflict burdens on others. Consider the cases of Eastman Kodak Company, the Schwinn Bicycle Company, and Element Electronics, Inc.

Globalization Forces Kodak to Reinvent Itself

Vladimir Lenin, a Russian politician, once said, “A capitalist will sell you the rope to hang him.” That quote may contain an element of truth. Capitalists often invest in the technology that ruins their business, as seen in the case of Eastman Kodak Company.

Kodak is a multinational imaging and photographic equipment company headquartered in Rochester, New York. Its history goes back to 1889 when it was founded by George Eastman. During much of the 1900s, Kodak held a dominant position in the photographic equipment market. In 1976 it had a 90 percent market share of film sales and an 85 percent share of camera sales in the United States. Kodak’s slogan was “You press the button and we do the rest.” However, Kodak’s near monopoly position resulted in a culture of complacency for its management who resisted changing their strategy as global competition and new technologies emerged.

In the 1980s, Japanese competitor Fuji Photo Film Co. entered the U.S. market with lower priced film and supplies. However, Kodak refused to believe that American consumers would ever desert its popular brand. Kodak passed on the opportunity to become the official film of the 1984 Los Angeles Olympics. Fuji won these sponsorship rights, which provided it a permanent foothold in the American market. Fuji opened up a film manufacturing plant in the United States, and its aggressive marketing and price cutting began capturing market share from Kodak. By the mid-1990s, Fuji held a 17 percent share of the U.S. market for photo film while Kodak’s market share plunged to 75 percent. Meanwhile, Kodak made little headway in Japan, the second largest market for its photo film and paper after the United States. Clearly, Kodak underestimated the competitiveness of its Japanese rival.

Another factor that contributed to Kodak’s decline was the development of digital cameras and smart phones that operate as cameras. Strange as it may seem, Kodak built one of the first digital cameras in 1975, but Kodak was slow in launching the production of digital cameras. Because Kodak’s competitors did not have this technology at that time, Kodak faced no pressure to change its strategy of selling cheap cameras to customers who would buy lots of its expensive film. All of this changed in the 1990s with the development of digital cameras by companies like Sony. With its lucrative film sales dropping, Kodak launched the production of digital cameras.

By 2005, Kodak ranked at the top of the digital camera market in the United States. Despite high growth, Kodak failed to anticipate how fast these digital cameras became commodities with low profit margins, as more companies entered the market. Kodak’s digital camera sales were quickly undercut by Asian competitors who could produce their cameras more cheaply. Also, smart phones were developed to replace cameras. Kodak also failed to understand emerging markets. Kodak hoped that the new Chinese middle class would purchase lots of film. They did for a short while, but then decided that digital cameras were preferable.

Kodak provides a striking example of an industrial giant that faltered in the face of global competition and advancing technology. By 2012 Kodak was running short of cash. As a result, Kodak filed for Chapter 11 bankruptcy under which it would undergo reorganization under the supervision of a bankruptcy court judge. Following its filing, Kodak

announced that it would stop making digital cameras, pocket video cameras, and digital picture frames and focus on the corporate digital imaging market. Therefore, Kodak sold off many of its businesses and patents while shutting down the camera unit that first made it famous. Many of Kodak's former employees lost retirement and health care benefits as a result of the bankruptcy. In 2013, Kodak received court approval for its plan to emerge from bankruptcy as a much smaller digital imaging company. It remains to be seen how Kodak will perform in the years ahead.

Bicycle Imports Force Schwinn to Downshift

The Schwinn Bicycle Company illustrates the notion of globalization and how producers react to foreign competitive pressure. Founded in Chicago in 1895, Schwinn grew to produce bicycles that became the standard of the industry. Although the Great Depression drove most bicycle companies out of business, Schwinn survived by producing durable and stylish bikes sold by dealerships that were run by people who understood bicycles and were anxious to promote the brand. Schwinn emphasized continuous innovation that resulted in features such as built-in kickstands, balloon tires, chrome fenders, head and tail lights, and more. By the 1960s, the Schwinn Sting Ray became the bicycle that virtually every child wanted. Celebrities such as Captain Kangaroo and Ronald Reagan pitched ads claiming that "Schwinn bikes are the best."

Although Schwinn dominated the U.S. bicycle industry; the nature of the bicycle market was changing. Cyclists wanted features other than heavy, durable bicycles that had been the mainstay of Schwinn for decades. Competitors emerged, such as Trek, which built mountain bikes, and Mongoose, which produced bikes for BMX racing.

Falling tariffs on imported bicycles encouraged Americans to import from companies in Japan, South Korea, Taiwan, and eventually China. These companies supplied Americans with everything ranging from parts to entire bicycles under U.S. brand names, or their own brands. Using production techniques initially developed by Schwinn, foreign companies hired low-wage workers to manufacture competitive bicycles at a fraction of Schwinn's cost.

As foreign competition intensified, Schwinn moved production to a plant in Greenville, Mississippi in 1981. The location was strategic. Like other U.S. manufacturers, Schwinn relocated production to the South in order to hire nonunion workers at lower wages. Schwinn also obtained parts produced by low-wage workers in foreign countries. The Greenville plant suffered from uneven quality and low efficiency, and it produced bicycles no better than the ones imported from Asia. As losses mounted for Schwinn, the firm declared bankruptcy in 1993.

Eventually Schwinn was purchased by the Pacific Cycle Company that farmed the production of Schwinn bicycles out to low-wage workers in China. Most Schwinn bicycles today are built in Chinese factories and are sold by Walmart and other discount merchants. Cyclists do pay less for a new Schwinn under Pacific's ownership. It may not be the industry standard that was the old Schwinn, but it sells at Walmart for approximately \$180, about a third of the original price in today's dollars. Although cyclists may lament that a Schwinn is no longer the bike it used to be, Pacific Cycle officials note that it is not as expensive as in the past either.⁴

⁴Judith Crown and Glenn Coleman, *No Hands: The Rise and Fall of the Schwinn Bicycle Company, an American Institution* (New York: Henry Holt and Co., 1996); and Jay Pridmore, *Schwinn Bicycles* (Osceola, WI: Motorbooks International, 2002). See also Griff Wittee, "A Rough Ride for Schwinn Bicycle," *The Washington Post*, December 3, 2004.

Element Electronics Survives by Moving TV Production to America

Few American industries have faltered as much as television manufacturing. During the 1950s–1960s, there were about 150 domestic producers and employment stood at about 100,000 workers. Imports began arriving, first from Japan and later from China, South Korea, and other Asian countries. The introduction of flat panel televisions tipped the scales further in favor of Asia, because their lighter weight and sleek styling made shipping costs cheaper than the heavier and more bulky tube televisions that formerly dominated sales. By the early 2000s, American television manufacturing was virtually nonexistent.

Costs in China have recently been going up as workers' wages and other expenses, such as transportation, have increased. Meanwhile, sluggish wage increases in the United States and rapid productivity gains have reshaped many U.S. factories into more robust competitors.

One such competitor is Element Electronics, Inc. headquartered in Eden Prairie, Minnesota. In 2012, Element Electronics became the only company assembling televisions in the United States. All of the parts of its televisions are imported. On an assembly line located in Detroit, Michigan, the firm produces a variety of flat screen models that are sold by Walmart, Target, and other retailers. Element Electronics made the decision to manufacture products in America to shorten its supply chain and related lead times, thus becoming more responsive to American consumers. This would allow the firm to get the right products, at the right price, to the right place at the right time as well as reduce waste and increase the quality of the consumer's out-of-box experience.

Element Electronics' locating a factory in Detroit provided advantages in terms of a qualified labor pool and distribution efficiencies based on population across the United States. Also, the firm said that by producing in Detroit rather than in Asia, it could avoid a 5 percent tariff on imported televisions and the higher cost of shipping televisions to American retailers. In 2013, the firm estimated that the average savings on tariffs was \$27 for a 46-inch television, enough to account for the higher-cost workers of Detroit. Moreover, the firm automated the assembly of its televisions to reduce the amount of labor required to build a television.

Officials of Element Electronics said that locating production in the United States was an emotional decision. Rather than being a contributor to jobs leaving America for other countries, they wanted to pioneer a resurgence of creating quality manufacturing jobs in the United States. Element Electronics televisions are shipped in boxes printed with a red, white, and blue flag on the side to portray a "Made in America" image. The boxes also display American workers assembling televisions at the Detroit factory.⁵

Common Fallacies of International Trade

Although gains from international trade are apparent, misconceptions prevail.⁶ One misconception is that trade results in a zero-sum game—if one trading partner benefits, the other must suffer. It turns out that both partners can benefit from trade.

Consider the example of trade between Colombia and Canada. These countries can produce more combined output when Canadians supply natural gas and Colombians supply

⁵Ashok Bindra, "Element Electronics Brings TV Manufacturing Back to the United States," *TMCNet*, January 11, 2012; "Element Electronics: USA Made TV Is Bringing Jobs Back Home," *American Made Insider*, February 17, 2013; Timothy Aepfel, "Detroit's Wages Take on China's," *The Wall Street Journal*, May 23, 2012; Matt Roush, "Element Electronics: America Matters," *CBS Detroit*, January 11, 2012.

⁶This section is drawn from James Gwartney and James Carter, *Twelve Myths of International Trade*, U.S. Senate, Joint Economic Committee, June 2000, pp. 4–11.

bananas. The larger output allows Colombians to benefit by using revenues from their banana exports to buy Canadian natural gas. Canadians benefit by using revenues from their natural gas exports to buy Colombian bananas. Therefore, the larger combined production yields mutual benefits for both countries. According to the principle of comparative advantage, if countries specialize in what they are relatively best at producing, they will import products that their trading partners are most efficient at producing, yielding benefits for both countries.

Another misconception is that imports result in unemployment and burden the economy, while exports enhance economic growth and jobs for workers. The source of this misconception is a failure to consider the connections between imports and exports. American imports of German machinery will result in losses of sales, output, and jobs in the U.S. machinery industry. However, as Germany's machinery sales to the United States increase, Germans will have more purchasing power to buy American computer software. Output and employment will thus increase in the U.S. computer software industry. The drag on the U.S. economy caused by rising imports of machinery tends to be offset by the stimulus on the economy caused by rising exports of computer software.

People sometimes feel tariffs, quotas, and other import restrictions result in more jobs for domestic workers. However, they fail to understand that a decrease in imports does not take place in isolation. When we impose import barriers that reduce the ability of foreigners to export to us, we are also reducing their ability to obtain the dollars required to import from us. Trade restrictions that decrease the volume of imports will also decrease exports. As a result, jobs promoted by import barriers tend to be offset by jobs lost due to falling exports.

If tariffs and quotas were that beneficial, why don't we use them to impede trade throughout the United States? Consider the jobs that are lost when, for example, Wisconsin purchases grapefruit from Florida, cotton from Alabama, tomatoes from Texas, and grapes from California. All of these goods could be produced in Wisconsin, although at a higher cost. Thus, Wisconsin residents find it less expensive to "import" these products. Wisconsin benefits by using its resources to produce and "export" milk, beer, electronics, and other products it can produce efficiently. Indeed, most people feel that free trade throughout America is an important contributor of prosperity for each of the states. The conclusions are the same for trade among nations. Free trade throughout America fosters prosperity; so, too, does free trade among nations.

INTERNATIONAL TRADE APPLICATION

Is the United States Losing Its Innovation Edge?

The next time that you are at an electronics store, pick up an iPhone. Open the box and you will find that the device was designed by Apple Inc. in California. Next look at the back of the iPhone and you will see that it was assembled in China.

In the past, the United States has seen numerous industries disappear from its shores and locate in other countries. Industries ranging from smart phones to wind turbines, from solar panel technology to highly advanced computer circuitry born in the United States, now exist elsewhere. Moreover, when abandoning an industry, the United



States may also lose technologies that would foster the development of future industries.

Consider the case of the Amazon Kindle. In 2007, in a Silicon Valley research facility, Amazon engineers and designers developed the Kindle electronic reader, a device that enables users to download and read newspapers, magazines, textbooks, and other digital media on a portable computer screen. Amazon first released the Kindle in November 2007 for \$399, and it sold out in 5.5 hours; the device remained out of stock for five months, until late April 2008. By 2011, the Kindle

(continued)

sold for less than \$140 as competition from other manufacturers intensified.

To produce the electronic ink for the Kindle, Amazon initially partnered with E-Ink Co., a U.S.-based firm. Because E-Ink did not have the technology to produce the computer screen for the Kindle, Amazon had to look for another partner. The search initially began in the United States, but it was not successful since American firms lacked the expertise and capability to produce the Kindle screen. Eventually, Amazon turned to Prime View, a Taiwanese manufacturer, to produce the screen. Soon thereafter, Prime View purchased E-Ink and moved its production operations from the United States to Taiwan. Even though the Kindle's key innovation, its electronic ink, was invented in the United States, most of the value added in producing the Kindle wound up being captured by the Taiwanese.

Some economists maintain that the United States has been losing its innovation edge as American manufacturers locate abroad. They note that manufacturing is a key driver of research and development that generates inventions that fuel economic growth. The United States cannot sustain the level of economic growth it needs without a strong manufacturing sector. According to these economists, to promote a stronger manufacturing sector, the United States needs investment-friendly public policies.

Other economists disagree. They contend that from the perspective of America's competitiveness, all of the key technologies and high-value-added activities are still captured on American soil and that the United States leads the world in scientific and technological development. They also note that trade and comparative advantage foster an evolution in a country's industries over time. In the television market, the manufacturing of televisions initially began in the United States. As technologies became standardized, television production moved offshore to countries with much lower wages and manufacturing costs, and prices continued to fall, to the benefit of consumers.

The global economy is dynamic, and the firms that have survived have been the ones able to transform their business models to match their competitors. U.S. firms will continue to face strong competition as other countries master next-generation production techniques and accrue expertise in innovation. In Chapter 2, we will learn more about the outsourcing of production and jobs to other countries.

What do you think? Is the United States losing its innovation edge?

Sources: Robert Gordon, *The Rise and Fall of American Growth*, Princeton University Press, Princeton, New Jersey, 2016; Andrew Liveris, *Make It in America: The Case for Re-Inventing the Economy*, John Wiley & Sons, Inc., Hoboken, New Jersey, 2011; and James Hagerly, "U.S. Manufacturers Gain Ground," *The Wall Street Journal*, August 18, 2013.

Is International Trade an Opportunity or a Threat to Workers?

International trade provides both an opportunity and a threat for firms and workers, as seen in the case of North Carolina. As of 2018, companies from North Carolina exported goods to countries such as Canada, Mexico, China, and Japan. The state's largest merchandise exports included chemicals, machinery, transportation equipment, computer and electronic products, and textiles and fabrics. Export activities created jobs for about 158,000 residents of North Carolina. However, international trade has also resulted in casualties to the firms and workers of North Carolina.

Consider the historic Revolution Cotton Mill in Greensboro, North Carolina. This textile mill was built in the early 1900s, an exciting era for North Carolina's businesses. America's cotton industry was moving south from New England to benefit from lower wages. The number of textile mills in the South more than doubled between 1890 and 1900, to 542. By 1938, Revolution Cotton Mill was the world's largest factory that exclusively produced flannel, making 50 million yards of cloth a year. However, today, you no longer hear the clacking of textile looms at Revolution Cotton Mill. It terminated production in 1982, an early indication of another revolution on a worldwide scale. The American textile industry was starting a fresh migration in search of cheaper labor, this time in Asia and Latin

America. Revolution Cotton Mill is now a monument to an industry that lost out to globalization. The mill is used to house apartments, restaurants, small businesses, and meeting places for local residents.

For the entire United States, international trade benefits many workers. Trade enables them to shop for the cheapest consumption goods and permits employers to purchase the technologies and equipment that best complement their workers' skills. Trade also allows workers to become more productive as the goods they produce increase in value. Producing goods for export generates jobs and income for domestic workers.

As seen in Table 1.4, the jobs of millions of Americans are connected to exports. For example, in 2015 about 11.5 million American jobs were supported by exports, or about 8 percent of total employment. Some 15 states accounted for over 70 percent of the total number of American jobs that were supported by exports in 2015; the top five states included Texas, California, Washington, New York, and Illinois, in descending order.

TABLE 1.4**Millions of American Jobs Supported by Exports: Total, Goods, and Services**

Year	Total	Goods	Services
2009	9.6	5.8	3.8
2010	10.2	6.2	4.0
2011	10.9	6.6	4.3
2012	11.2	6.7	4.5
2013	11.4	6.7	4.7
2014	11.6	6.8	4.8
2015	11.5	6.7	4.8

Source: Chris Rasmussen, Office of Trade and Economic Analysis, International Trade Administration, U.S. Department of Commerce, *Jobs Supported by Exports 2015: An Update*, April 8, 2016.

For Americans working for exporting firms, average wages are about 18 percent higher than average wages in nonexporting firms.⁷ Why? Increasing trade allows production resources such as labor and capital to be used more efficiently, which increases total productivity. Firms that are more productive tend to rely more on capital and skilled workers than similar nonexporting firms. Partly due to this, the wages paid by exporting firms tend to be higher than the wages paid by nonexporting firms in the same industry. Also, export-intensive industries tend to employ a more highly educated workforce, and the higher earnings reflect the industry composition of the workforce.

However, not all workers gain from international trade. The world trading system, for example, has come under attack by some in industrial countries where rising unemployment and wage inequality have made people feel apprehensive about the future. Cheap exports produced by lower-cost foreign workers threaten to eliminate jobs for some workers in industrial countries. Others worry that firms are relocating abroad in search of low wages and lax environmental standards or fear that masses of poor immigrants will be at their company's door, offering to work for lower wages. Trade with low-wage developing countries is particularly threatening to unskilled workers in the import-competing sectors of industrial countries.

⁷David Riker, *Do Jobs in Export Industries Still Pay More? And Why?* Office of Competition and Economic Analysis, International Trade Administration, U.S. Department of Commerce, July 2010.

As an economy opens up to international trade, domestic prices become more aligned with international prices; wages tend to increase for workers whose skills are more scarce internationally than at home and to decrease for workers who face increased competition from foreign workers. As the economies of foreign nations open up to trade, the relative scarcity of various skills in the world marketplace changes still further, harming those countries with an abundance of workers who have the skills that are becoming less scarce. Increased competition also suggests that unless countries match the productivity gains of their competitors, the wages of their workers will deteriorate. It is no wonder that workers in import-competing industries often lobby for restrictions on the importation of goods so as to neutralize the threat of foreign competition. Slogans such as “Buy American” and “American goods create American jobs” have become rallying cries among many U.S. workers.

Keep in mind that what is true for the part is not necessarily true for the whole. It is certainly true that imports of steel or automobiles can eliminate American jobs. It is not true that imports decrease the total number of jobs in a nation. A large increase in U.S. imports will inevitably lead to a rise in U.S. exports or foreign investment in the United States. In other words, if Americans suddenly wanted more European autos, eventually American exports would have to increase to pay for these products. The jobs lost in one industry are replaced by jobs gained in another industry. The long run effect of trade barriers is not to increase total domestic employment, but to reallocate workers away from export industries and toward less efficient, import-competing industries. This reallocation leads to a less efficient utilization of resources.

International trade is just another kind of technology. Think of it as a machine that adds value to its inputs. In the United States, trade is the machine that turns computer software that the United States makes very well into CD players, baseballs, and other things that it also wants but does not make quite so well. International trade does this at a net gain to the economy as a whole. If somebody invented a device that could do this, it would be considered a miracle. Fortunately, international trade has been developed.

If international trade is squeezing the wages of the less skilled, so are other kinds of advancing technology, only more so. “Yes,” you might say, “but to tax technological progress or put restrictions on labor saving investment would be idiotic: That would only make everybody worse off.” Indeed it would, and exactly the same goes for international trade—whether this superior technology is taxed (through tariffs) or overregulated (in the form of international efforts to harmonize labor standards).

This is not an easy thing to explain to American textile workers who compete with low-wage workers in China, Malaysia, and other countries. Free trade agreements will be more easily reached if those who might lose by new trade are helped by all of the rest of us who gain.

Has Globalization Gone Too Far?

Throughout much of the post–World War II era, the United States increasingly became an open economy. By the late 1990s, free trade, free flows of capital, deregulation, and the like were widely celebrated. The U.S. economy was booming, jobs were plentiful, and wages were increasing for many Americans. Also, hundreds of millions of workers throughout Europe and Asia, that were no longer dominated by the former Soviet Union, were on the road to integration in the global economy.

Most mainstream economists maintain that open economies provide more and more-varied opportunities than do closed ones. And, in general, greater opportunity makes people better off. Without trade, coffee drinkers in the United States would pay much higher prices because the nation’s supply would depend solely on Hawaiian or Puerto Rican sources.

The optimism of most mainstream economists is based on evidence that the developed world has seen its wealth grow substantially over the last five decades as its commitment to an open trading system has strengthened. Indeed, the distribution of this wealth has been uneven, with the incomes of the least skilled workers in the developed world decreasing or, at best, holding steady. But most mainstream economists interpret the decreasing returns to these workers as attributable mainly to changes in the methods of production (technological innovation), not to competition from foreign workers.

In spite of this optimism, critics maintain that U.S. trade policies primarily benefit large corporations rather than average citizens—of the United States or any other country. Environmentalists argue that elitist trade organizations, such as the World Trade Organization, make undemocratic decisions that undermine national sovereignty on environmental regulation. Unions maintain that unfettered trade permits unfair competition from countries that lack labor standards. Human rights activists contend that the World Bank and International Monetary Fund support governments that allow sweatshops and pursue policies that bail out governmental officials at the expense of local economies. A gnawing sense of unfairness and frustration has emerged about trade policies that ignore the concerns of the environment, American workers, and international labor standards.

The noneconomic aspects of globalization are at least as important in shaping the international debate as are the economic aspects. Many of those who object to globalization resent the political and military dominance of the United States. They also resent the influence of foreign (mainly American) culture, as they see it, at the expense of national and local cultures. Table 1.5 summarizes some of the pros and cons of globalization.

Some economists have detected a structural problem of globalization. They maintain that by the 2000s, globalization was increasingly exposing a deep fault line between groups who have the skills and mobility to flourish in global markets and those who don't have these advantages. For example, America's massive increases in imports from China have adversely affected employment and wages in parts of the country (Tennessee, Kentucky, Ohio, and Pennsylvania) that produce goods (footwear, apparel, furniture, and low-end electronics) that compete with China. The workers in those regions are often the losers of globalization. When they lose a factory job, they often stay put; those who manage to find new jobs are paid less than before. What should be done to help displaced workers has become a political hot potato for government officials.

Yet some regions of the United States have rebounded from the adversities of globalization, as seen in the case of South Carolina. In the 1990s, South Carolina was a "three T" state—that's tobacco, textiles, and tourism. Like other states, South Carolina saw its traditional industries harmed by globalization and automation, as low-skilled factory jobs disappeared or migrated to low-labor-cost countries. However, by the 2000s, South Carolina was regaining manufacturing jobs thanks to a combination of economic incentives, robust supply chains, and trading infrastructure. Also, there is an abundance of cheap labor in the state, partly due to the lowest union membership in the country. South Carolina's economic revival strategy has attracted global manufacturers like Mercedes, Honda, BMW, Michelin, and Boeing which hire highly skilled workers—many trained at one of South Carolina's 16 technical colleges through the state-sponsored program Ready South Carolina. But labor union officials maintain that South Carolina is building industries on the backs of non-union workers who are getting a raw deal compared to unionized workers in other parts of the United States.

TABLE 1.5**Advantages and Disadvantages of Globalization****Advantages**

Productivity increases faster when countries produce goods and services in which they have a comparative advantage. Living standards can increase more rapidly.

Global competition and cheap imports keep a constraint on prices, so inflation is less likely to disrupt economic growth.

An open economy promotes technological development and innovation, with fresh ideas from abroad.

Jobs in export industries typically pay up to 18 percent more than jobs in import-competing industries.

Unfettered capital movements provide the United States access to foreign investment and maintain low interest rates.

Disadvantages

Millions of Americans have lost jobs because of imports or shifts in production abroad. Most find new jobs that pay less.

Millions of other Americans fear getting laid off, especially at those firms operating in import-competing industries.

Workers face demands of wage concessions from their employers, which often threaten to export jobs abroad if wage concessions are not accepted.

Besides blue collar jobs, service jobs and white collar jobs are increasingly vulnerable to operations being sent overseas.

American employees can lose their competitiveness when companies build state-of-the-art factories in low-wage countries, making them as productive as those in the United States.

Source: "Backlash Behind the Anxiety over Globalization," *Business Week*, April 24, 2000, p. 41.

At the writing of this textbook, there was growing recognition that labor-market adjustment to the adversities of globalization or technological change is often too slow in the United States, as in many other countries. How to help people who are disadvantaged by globalization and technological change, while preserving a free trade environment, is at the center of the debate surrounding globalization. It remains to be seen how these issues will be resolved.

The Plan of This Text

This text is an examination of the functioning of the international economy. Although the emphasis is on the theoretical principles that govern international trade, there also is considerable coverage of the empirical evidence of world trade patterns and trade policies of the industrial and developing nations. The book is divided into two parts. Part 1 deals with international trade and commercial policy; Part 2 stresses the balance of payments and the adjustment in the balance of payments.

Chapters 2 and 3 deal with the theory of comparative advantage, as well as theoretical extensions and empirical tests of this theory. This topic is followed by Chapters 4 through 6, a treatment of tariffs, nontariff trade barriers, and contemporary trade policies of the United States. Discussions of trade policies for the developing nations, regional trading arrangements, and international factor movements in Chapters 7 through 9 complete the first part of the text.

The treatment of international financial relations begins with an overview of the balance of payments, the foreign exchange market, and the exchange rate determination in Chapters 10 through 12. The balance-of-payment adjustment under alternative exchange rate regimes is discussed in Chapters 13 and 14. Chapter 15 considers macroeconomic policy in an open economy.

SUMMARY

1. Throughout the post–World War II era, the world’s economies have become increasingly interdependent in terms of the movement of goods and services, business enterprise, capital, and technology.
2. The United States has seen growing interdependence with the rest of the world in its trade sector, financial markets, ownership of production facilities, and labor force.
3. Largely owing to the vastness and wide diversity of its economy, the United States remains among the countries whose exports constitute a small fraction of national output.
4. Proponents of an open trading system contend that international trade results in higher levels of consumption and investment, lower prices of commodities, and a wider range of product choices for consumers. Arguments against free trade tend to be voiced during periods of excess production capacity and high unemployment.
5. International competitiveness can be analyzed in terms of a firm, an industry, and a nation. Key to the concept of competitiveness is productivity, or output per worker hour.
6. Researchers have shown that exposure to competition with the world leader in an industry improves a firm’s performance in that industry. Global competitiveness is a bit like sports: You get better by playing against folks who are better than you.
7. Although international trade helps workers in export industries, workers in import-competing industries feel the threat of foreign competition. They often see their jobs and wage levels undermined by cheap foreign labor.
8. Among the challenges that the international trading system faces are dealing with fair labor standards and concerns about the environment.

KEY CONCEPTS AND TERMS

Agglomeration economies (p. 6)
Economic interdependence (p. 1)

Globalization (p. 3)
Law of comparative advantage (p. 13)

Openness (p. 10)

STUDY QUESTIONS

1. What factors explain why the world’s trading nations have become increasingly interdependent, from an economic and political viewpoint, during the post–World War II era?
2. What are some of the major arguments for and against an open trading system?
3. What significance does growing economic interdependence have for a country like the United States?
4. What factors influence the rate of growth in the volume of world trade?
5. Identify the major fallacies of international trade.
6. What is meant by international competitiveness? How does this concept apply to a firm, an industry, and a nation?
7. What do researchers have to say about the relation between a firm’s productivity and exposure to global competition?
8. When is international trade an opportunity for workers? When is it a threat to workers?
9. Identify some of the major challenges confronting the international trading system.

PART

1

International Trade Relations



Foundations of Modern Trade Theory: Comparative Advantage



The previous chapter discussed the importance of international trade. This chapter answers the following questions: (1) What constitutes the **basis for trade**—that is, why do nations export and import certain products? (2) At what **terms of trade** are products exchanged in the world market? (3) What are the **gains from international trade** in terms of production and consumption? This chapter addresses these questions, first by summarizing the historical development of modern trade theory and next by presenting the contemporary theoretical principles used in analyzing the effects of international trade.

Historical Development of Modern Trade Theory

Modern trade theory is the product of an evolution of ideas in economic thought. In particular, the writings of the mercantilists, and later those of the classical economists—Adam Smith, David Ricardo, and John Stuart Mill—have been instrumental in providing the framework of modern trade theory.

The Mercantilists

During the period 1500–1800, a group of writers appeared in Europe who were concerned with the process of nation building. According to the **mercantilists**, the central question was how a nation could regulate its domestic and international affairs to promote its own interests. The solution lay in a strong foreign trade sector. If a country could achieve a *favorable trade balance* (a surplus of exports over imports), it would realize net payments received from the rest of the world in the form of gold and silver. Such revenues would contribute to increased spending and a rise in domestic output and employment. To promote a favorable trade balance, the mercantilists advocated government regulation of trade. Tariffs, quotas, and other commercial policies were proposed by the mercantilists to minimize imports in order to protect a nation's trade position.¹

¹See E. A. J. Johnson, *Predecessors of Adam Smith* (New York: Prentice-Hall, 1937).

By the eighteenth century, the economic policies of the mercantilists were under strong attack. According to David Hume's **price-specie-flow doctrine**, a favorable trade balance is possible only in the short run for over time it would automatically be eliminated. To illustrate, suppose England achieves a trade surplus that results in an inflow of gold and silver. Because these precious metals constitute part of England's money supply, their inflow increases the amount of money in circulation. This leads to a rise in England's price level relative to that of its trading partners. English residents would therefore be encouraged to purchase foreign-produced goods, while England's exports would decline. As a result, the country's trade surplus would eventually be eliminated. The price-specie-flow mechanism thus shows that mercantilist policies could provide at best only short-term economic advantages.²

The mercantilists were also attacked for their *static view* of the world economy. To the mercantilists, the world's wealth was fixed. This view meant that one nation's gains from trade came at the expense of its trading partners; not all nations could simultaneously enjoy the benefits of international trade. This view was challenged with the publication in 1776 of Adam Smith's *The Wealth of Nations*. According to Smith (1723–1790), the world's wealth is not a fixed quantity. International trade permits nations to take advantage of specialization and the division of labor that increase the general level of productivity within a country and thus increase world output (wealth). Smith's dynamic view of trade suggested that *both* trading partners could simultaneously enjoy higher levels of production and consumption with trade. Smith's trade theory is further explained in the next section.

Although the foundations of mercantilism have been refuted, mercantilism is alive today. However, it now emphasizes employment rather than holdings of gold and silver. Neo-mercantilists contend exports are beneficial because they result in jobs for domestic workers, while imports are bad because they take jobs away from domestic workers and transfer them to foreign workers. Trade is considered a zero-sum activity in which one country must lose for the other to win. There is no acknowledgment that trade can provide benefits to all countries, including mutual benefits in employment as prosperity increases throughout the world.

Why Nations Trade: Absolute Advantage

Adam Smith, a classical economist, was a leading advocate of **free trade** (open markets) on the grounds that it promoted the international division of labor. With free trade, nations could concentrate their production on the goods that they could make the most cheaply, with all the consequent benefits from the division of labor.

Accepting the idea that *cost differences* govern the international movement of goods, Smith sought to explain why costs differ among nations. Smith maintained that *productivities* of factor inputs represent the major determinant of production cost. Such productivities are based on natural and acquired advantages. The former include factors relating to climate, soil, and mineral wealth, whereas the latter include special skills and techniques. Given a natural or acquired advantage in the production of a good, Smith reasoned that a nation would produce that good at a lower cost and become more competitive than its trading partner. Smith viewed the determination of competitiveness from the *supply side* of the market.³

²David Hume, "Of Money," *Essays*, Vol. 1 (London: Green and Co., 1912), p. 319. Hume's writings are also available in Eugene Rotwein, *The Economic Writings of David Hume* (Edinburgh: Nelson, 1955).

³Adam Smith, *The Wealth of Nations* (New York: Modern Library, 1937), pp. 424–426.

Smith founded his concept of cost on the **labor theory of value** that assumes that, within each nation, labor is the only factor of production and is homogeneous (of one quality) and the cost or price of a good depends exclusively on the amount of labor required to produce it. For example, if the United States uses less labor to manufacture a yard of cloth than the United Kingdom, the U.S. production cost will be lower.

Smith's trading principle was the **principle of absolute advantage**: In a two-nation, two-product world, international specialization and trade will be beneficial when one nation has an absolute cost advantage (uses less labor to produce a unit of output) in one good and the other nation has an absolute cost advantage in the other good. For the world to benefit from specialization, each nation must have a good that is absolutely more efficient in producing than its trading partner. A nation will *import* goods in which it has an absolute cost *disadvantage* and *export* those goods in which it has an absolute cost *advantage*.

An arithmetic example helps illustrate the principle of absolute advantage. Referring to Table 2.1, suppose workers in the United States can produce 5 bottles of wine or 20 yards of cloth in an hour's time, while workers in the United Kingdom can produce 15 bottles of wine or 10 yards of cloth in an hour. Clearly, the United States has an absolute advantage in cloth production; its cloth workers' productivity (output per worker hour) is higher than that of the United Kingdom, and leads to lower costs (less labor required to produce a yard of cloth). In like manner, the United Kingdom has an absolute advantage in wine production.

TABLE 2.1

A Case of Absolute Advantage When Each Nation Is More Efficient in the Production of One Good

World output possibilities in the absence of specialization

Nation	OUTPUT PER LABOR HOUR	
	Wine	Cloth
United States	5 bottles	20 yards
United Kingdom	15 bottles	10 yards

According to Smith, each nation benefits by specializing in the production of the good that it produces at a lower cost than the other nation, while importing the good that it produces at a higher cost. Because the world uses its resources more efficiently as the result of specializing, an increase in world output occurs that is distributed to the two nations through trade. All nations can benefit from trade, according to Smith.

The writings of Smith established the case for free trade that is still influential today. According to Smith, free trade would increase competition in the home market and reduce the market power of domestic companies by lessening their ability to take advantage of consumers by charging high prices and providing poor service. Also, the country would benefit by exporting goods that are desired on the world market for imports that are cheap on the world market. Smith maintained that the wealth of a nation depends on this division of labor that is limited by the extent of the market. Smaller and more isolated economies cannot support the degree of specialization needed to significantly increase productivity and reduce cost, and thus tend to be relatively poor. Free trade allows countries, especially smaller countries, to more fully take advantage of the division of labor, thus attaining higher levels of productivity and real income.

INTERNATIONAL TRADE APPLICATION

Adam Smith and David Ricardo

For more than two centuries, many economists have advocated free trade among nations as the best trade policy. Adam Smith and David Ricardo were pioneers of the argument for free trade. They maintained that, with specialization and trade, the world economy can attain a more efficient allocation of resources and a higher level of material well-being than it can without free trade. Let us briefly consider the lives and ideas of these two influential economists.



Adam Smith

Adam Smith (1723–1790) was born in Kirkcaldy, Scotland, where his widowed mother raised him. At age 14, he entered the University of Glasgow on scholarship and later enrolled at Oxford University, studying social philosophy. In 1751, he obtained a professorship at University of Glasgow, teaching moral philosophy. In his later life, Smith took a tutoring position that permitted him to travel throughout Europe, where he met and communicated with other intellectual leaders of his time.

Smith is best known for two classic works: *The Theory of Moral Sentiments* (1759) and *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776). He is widely regarded as the founder of modern economics and is among the most influential thinkers in the field of economics today.

Smith believed that free trade and a self-regulating economy foster social progress. He criticized the British government's tariffs and other restrictions on individual freedom in trade. Smith maintained that government need only maintain law and order, enforce justice, defend the nation, and provide for a few social needs that could not be provided by the market.

One aspect of the English scene struck Smith. This was the substantial increase in productivity that resulted from the division and specialization of labor. Going into a pin factory, Smith saw a group of ten workers producing upward of 48,000 pins in a day as a result of specialization and the division of labor. He noted that if these workers had all worked separately and independently, they could not each of them produce 20 pins, perhaps not even one pin, in a day.

Smith felt that the operation of a market system results in unity between private interests and social

interests. Firms and suppliers of resources, desiring to fulfill their own self-interest and operating within the framework of a competitive market system, will simultaneously, as though led by an “invisible hand,” foster the public or social interest. Nevertheless, he was skeptical of businessmen and warned of their conspiracy against the public to increase prices. He also warned that a business-dominated political system would permit a conspiracy of businesses against consumers.

The Wealth of Nations went through five editions during Smith's lifetime, but it had minimal impact on economic policy until the early 1800s.

David Ricardo

David Ricardo (1772–1823) was the leading British economist of the early 1800s. He helped develop the theories of *classical economics* that emphasize economic freedom through free trade and competition. Ricardo was a successful businessman, financier, and speculator, and he accumulated a sizable fortune.

Being the third of 17 children, Ricardo was born into a wealthy Jewish family. His father was a merchant banker. They initially lived in the Netherlands and then moved to London. Having little formal education and never attending college, Ricardo went to work for his father at the age of 14. When he was 21, Ricardo married a Quaker despite his parents' preferences. After his family disinherited him for marrying outside the Jewish faith, Ricardo became a stockbroker and a loan broker. He was highly successful in business and was able to retire at 42, accumulating an estate that was worth more than \$100 million in today's dollars. Upon retirement, Ricardo bought a country estate and established himself as a country gentleman. In 1819, Ricardo purchased a seat in the British Parliament and held the post until the year of his death in 1823. As a member of Parliament, Ricardo advocated the repeal of the Corn Laws that established trade barriers to protect British landowners from foreign competition. However, he was unable to get Parliament to abolish the law at that time; it was not repealed until 1846.

Ricardo's interest in economics was inspired by a chance reading of Adam Smith's *The Wealth of Nations* when he was in his late twenties. Upon the urging of his friends, Ricardo began writing newspaper articles on

(continued)

economic questions. In 1817, Ricardo published his groundbreaking *The Principles of Political Economy and Taxation* that laid out the theory of comparative advantage as discussed in this chapter.

Like Adam Smith, Ricardo was an advocate of free trade and an opponent of protectionism. He believed that protectionism led countries toward economic stagnation. However, Ricardo was less confident than Smith about the ability of a market economy's potential to benefit society. Instead, Ricardo felt that the economy tends to move toward a standstill. Yet Ricardo contended that if government meddled with the economy, the result would be only further economic stagnation.

Ricardo's ideas have greatly affected other economists. His theory of comparative advantage has been a cornerstone of international trade theory for about 200 years and has influenced generations of economists in the belief that protectionism is bad for an economy.

What do you think? Compare the ideas of Adam Smith and David Ricardo regarding free trade and protectionism.

Sources: Roy Campbell and A. S. Skinner, *Adam Smith* (New York: St. Martin's, 1982); Mark Blaug, *Ricardian Economics* (New Haven, CT: Yale University Press, 1958); Samuel Hollander, *The Economics of David Ricardo* (Cambridge: Cambridge University Press, 1993); and Robert Heilbroner, *The Worldly Philosophers* (New York: Simon and Schuster, 1961).

Why Nations Trade: Comparative Advantage

In 1800, a wealthy London businessman named David Ricardo (1772–1823) came across *The Wealth of Nations* while on vacation and was intrigued. Although Ricardo appreciated the persuasive flair of Smith's argument for free trade, he thought that some of Smith's analysis needed improvement. According to Smith, mutually beneficial trade requires each nation to be the *least-cost producer* of at least one good it can export to its trading partner. But what if a nation is more efficient than its trading partner in the production of *all* goods? Dissatisfied with this looseness in Smith's theory, Ricardo developed a principle to show that mutually beneficial trade can occur whether or not countries have an absolute advantage. Ricardo's theory became known as the **principle of comparative advantage**.⁴

Like Smith, Ricardo emphasized the supply side of the market. The immediate basis for trade stemmed from the cost differences between nations that their natural and acquired advantages supported. Unlike Smith, who emphasized the importance of absolute cost differences among nations, Ricardo emphasized *comparative* (relative) cost differences. Indeed, countries often develop comparative advantages, as shown in Table 2.2.

According to the principle of comparative advantage, even if a nation has an absolute cost disadvantage in the production of *both* goods, a basis for mutually beneficial trade may still exist. The *less efficient* nation should specialize in and export the good in which it is relatively less inefficient (where its absolute disadvantage is least). The *more efficient* nation should specialize in and export that good in which it is relatively more efficient (where its absolute advantage is greatest).

To demonstrate the principle of comparative advantage, Ricardo formulated a simplified model based on the following *assumptions*:

1. The world consists of two nations, each using a single input to produce two commodities.
2. In each nation, labor is the only input (the labor theory of value). Each nation has a fixed endowment of labor and labor is fully employed and homogeneous.
3. Labor can move freely among industries within a nation but is incapable of moving between nations.

⁴David Ricardo, *The Principles of Political Economy and Taxation* (London: Cambridge University Press, 1966), Chapter 7. Originally published in 1817.

TABLE 2.2**Examples of Comparative Advantages in International Trade**

Country	Product
Canada	Lumber
Israel	Citrus fruit
Italy	Wine
Jamaica	Aluminum ore
Mexico	Tomatoes
Saudi Arabia	Oil
China	Textiles
Japan	Automobiles
South Korea	Steel, ships
Switzerland	Watches
United Kingdom	Financial services

4. The level of technology is fixed for both nations. Different nations may use different technologies, but all firms within each nation utilize a common production method for each commodity.
5. Costs do not vary with the level of production and are proportional to the amount of labor used.
6. Perfect competition prevails in all markets. Because no single producer or consumer is large enough to influence the market, all are price takers. Product quality does not vary among nations, implying that all units of each product are identical. There is free entry to and exit from an industry, and the price of each product equals the product's marginal cost of production.
7. Free trade occurs between nations; that is, no government barriers to trade exist.
8. Transportation costs are zero. Consumers will thus be indifferent between domestically produced and imported versions of a product if the domestic prices of the two products are identical.
9. Firms make production decisions in an attempt to maximize profits, whereas consumers maximize satisfaction through their consumption decisions.
10. There is no money illusion; when consumers make their consumption choices and firms make their production decisions, they take into account the behavior of all prices.
11. Trade is balanced (exports must pay for imports), thus ruling out flows of money between nations.

Table 2.3 illustrates Ricardo's principle of comparative advantage when one nation has an absolute advantage in the production of both goods. Assume that in one hour's time, U.S. workers can produce 40 bottles of wine or 40 yards of cloth, while U.K. workers can produce 20 bottles of wine or 10 yards of cloth. According to Smith's principle of absolute advantage, there is no basis for mutually beneficial specialization and trade because the U.S. workers are more efficient in the production of both goods.

However, the principle of comparative advantage recognizes that U.S. workers are four times as efficient in cloth production ($40/10 = 4$) but only twice as efficient in wine production ($40/20 = 2$). The United States thus has a *greater absolute advantage* in cloth than in wine, while the United Kingdom has a *smaller absolute disadvantage* in wine than in cloth. Each nation specializes in and exports that good in which it has a *comparative advantage*—the

TABLE 2.3

A Case of Comparative Advantage When the United States Has an Absolute Advantage in the Production of Both Goods

World output possibilities in the absence of specialization

Nation	OUTPUT PER LABOR HOUR	
	Wine	Cloth
United States	40 bottles	40 yards
United Kingdom	20 bottles	10 yards

United States in cloth, and the United Kingdom in wine. Therefore, through the process of trade, the two nations receive the output gains from specialization. Like Smith, Ricardo asserted that both nations can gain from trade.

Simply put, Ricardo's principle of comparative advantage maintains that international trade is solely due to international differences in the productivity of labor. The basic prediction of Ricardo's principle is that countries tend to export those goods in which their labor productivity is relatively high.

In recent years, the United States has realized large trade deficits (imports exceed exports) with countries such as China and Japan. Some of those who have witnessed the flood of imports coming into the United States seem to suggest that the United States does not have a comparative advantage in anything. It is possible for a nation not to have an absolute advantage in anything, but it is not possible for one nation to have a comparative advantage in everything and the other nation to have a comparative advantage in nothing. That's because comparative advantage depends on *relative* costs. As we have seen, a nation having an absolute disadvantage in all goods would find it advantageous to specialize in the production of the good in which its absolute disadvantage is *least*. There is no reason for the United States to surrender and let China produce all of everything. The United States would lose and so would China, because world output would be reduced if U.S. resources were left idle. The idea that a nation has nothing to offer confuses absolute advantage and comparative advantage.

Although the principle of comparative advantage is used to explain international trade patterns, people are not generally concerned with which nation has a comparative advantage when they purchase something. A person in a candy store does not look at Swiss chocolate and U.S. chocolate and ask, "I wonder which nation has the comparative advantage in chocolate production?" The buyer relies on price, after allowing for quality differences, to tell which nation has the comparative advantage. It is helpful, then, to illustrate how the principle of comparative advantage works in terms of money prices, as seen in *Exploring Further 2.1* that can be found in MindTap.

Production Possibilities Frontiers

Ricardo's law of comparative advantage suggested that specialization and trade can lead to gains for both nations. His theory, however, depended on the restrictive assumption of the labor theory of value, in which labor was assumed to be the only factor input. In practice, labor is only one of several factor inputs.

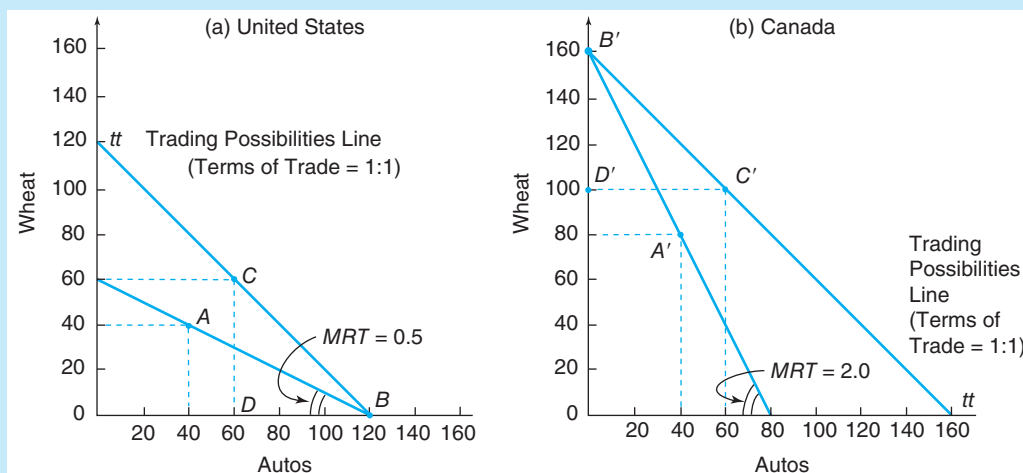
Recognizing the shortcomings of the labor theory of value, modern trade theory provides a more generalized theory of comparative advantage. It explains the theory using a **production possibilities frontier**. This frontier shows various alternative combinations of

two goods that a nation can produce when *all* of its factor inputs (land, labor, capital, and entrepreneurship) are used in their most efficient manner. The production possibilities frontier thus illustrates the maximum output possibilities of a nation. Note that we are no longer assuming labor to be the only factor input, as Ricardo did.

Figure 2.1 illustrates hypothetical production possibilities frontiers for the United States and Canada. By fully using all available inputs with the best available technology during a given time period, the United States can produce either 60 bushels of wheat or 120 autos or certain combinations of the two products. Similarly, Canada can produce either 160 bushels of wheat or 80 autos or certain combinations of the two products.

FIGURE 2.1

Trading under Constant Opportunity Costs



With constant opportunity costs, a nation will specialize in the product of its comparative advantage. The principle of comparative advantage implies that with specialization and free trade, a nation enjoys production gains and consumption gains. A nation's trade triangle denotes its exports, imports, and terms of trade. In a two-nation, two-product world, the trade triangle of one nation equals that of the other nation; one nation's exports equal the other nation's imports, and there is one equilibrium terms of trade.

Just how does a production possibilities frontier illustrate the concept of comparative cost? The answer lies in the slope of the production possibilities frontier, which is referred to as the **marginal rate of transformation (MRT)**. The MRT shows the amount of one product a nation must sacrifice to get one additional unit of the other product:

$$MRT = \frac{\Delta \text{Wheat}}{\Delta \text{Autos}}$$

This rate of sacrifice is sometimes called the *opportunity cost* of a product. Because this formula also refers to the slope of the production possibilities frontier, the MRT equals the absolute value of the production possibilities frontier's slope.

In Figure 2.1, the MRT of wheat into autos gives the amount of wheat that must be sacrificed for each additional auto produced. Concerning the United States, movement from the top endpoint on its production possibilities frontier to the bottom endpoint shows that the relative cost of producing 120 additional autos is the sacrifice of 60 bushels of wheat. This sacrifice means that the relative cost of each auto produced is 0.5 bushel of wheat sacrificed ($60/120 = 0.5$); the MRT = 0.5. Similarly, Canada's relative cost of each auto produced is 2 bushels of wheat; that is, Canada's MRT = 2.0.

Trading under Constant-Cost Conditions

This section illustrates the principle of comparative advantage under **constant opportunity costs**. Although the constant-cost case may be of limited relevance to the real world, it serves as a useful pedagogical tool for analyzing international trade. The discussion focuses on two questions. First, what are the *basis for trade* and the *direction of trade*? Second, what are the potential *gains from trade*, for a single nation and for the world as a whole?

Referring to Figure 2.1, notice that the production possibilities frontiers for the United States and Canada are drawn as straight lines. The fact that these frontiers are linear indicates that the relative costs of the two products do not change as the economy shifts its production from all wheat to all autos or anywhere in between. For the United States, the relative cost of an auto is 0.5 bushel of wheat as output expands or contracts; for Canada, the relative cost of an auto is 2 bushels of wheat as output expands or contracts.

There are *two reasons* for constant costs. First, the factors of production are perfect substitutes for each other. Second, all units of a given factor are of the same quality. As a country transfers resources from the production of wheat into the production of autos, or vice versa, the country will not have to resort to resources that are inadequate for the production of the good. Therefore, the country must sacrifice exactly the same amount of wheat for each additional auto produced, regardless of how many autos it is already producing.

Basis for Trade and Direction of Trade

Let us examine trade under constant-cost conditions. Referring to Figure 2.1, assume that in **autarky** (the absence of trade) the United States prefers to produce and consume at point *A* on its production possibilities frontier, with 40 autos and 40 bushels of wheat. Assume also that Canada produces and consumes at point *A'* on its production possibilities frontier, with 40 autos and 80 bushels of wheat.

The *slopes* of the two countries' production possibilities frontiers give the *relative cost* of one product in terms of the other. The relative cost of producing an additional auto is only 0.5 bushel of wheat for the United States, but it is 2 bushels of wheat for Canada. According to the principle of comparative advantage, this situation provides a basis for mutually favorable specialization and trade owing to the differences in the countries' relative costs. As for the direction of trade, we find the United States specializing in and exporting autos and Canada specializing in and exporting wheat.

Production Gains from Specialization

The law of comparative advantage asserts that with trade, each country will find it favorable to specialize in the production of the good of its comparative advantage and will trade part of this for the good of its comparative disadvantage. In Figure 2.1, the United States moves from production point *A* to production point *B*, totally specializing in auto production. Canada specializes in wheat production by moving from production point *A'* to production point *B'* in the figure. Taking advantage of specialization can result in **production gains** for both countries.

We find that prior to specialization, the United States produces 40 autos and 40 bushels of wheat. But with complete specialization, the United States produces 120 autos and no wheat. As for Canada, its production point in the absence of specialization is at 40 autos and 80 bushels of wheat, whereas its production point under complete specialization is at 160 bushels of wheat and no autos. Combining these results, we find that both nations together have experienced a net production gain of 40 autos and 40 bushels of wheat under conditions of complete specialization. Table 2.4(a) summarizes these production gains. Because these production gains arise from the reallocation of *existing* resources, they are also called the *static gains* from specialization: Through specialization, a country can use its current supply of resources more efficiently and thus achieve a higher level of output than it could without specialization.

TABLE 2.4**Gains from Specialization and Trade: Constant Opportunity Costs****(a) Production Gains from Specialization**

	BEFORE SPECIALIZATION		AFTER SPECIALIZATION		NET GAIN (LOSS)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	40	40	120	0	80	−40
Canada	40	80	0	160	−40	80
World	80	120	120	160	40	40

(b) Consumption Gains from Trade

	BEFORE TRADE		AFTER TRADE		NET GAIN (LOSS)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	40	40	60	60	20	20
Canada	40	80	60	100	20	20
World	80	120	120	160	40	40

Japan's opening to the global economy is an example of the static gains from comparative advantage. Responding to pressure from the United States, in 1859 Japan opened its ports to international trade after more than two hundred years of self-imposed economic isolation. In autarky, Japan found that it had a comparative advantage in some products and a comparative disadvantage in others. For example, the price of tea and silk was much higher on world markets than in Japan prior to the opening of trade, while the price of woolen goods and cotton was much lower on world markets. Japan responded according to the principle of comparative advantage: It exported tea and silk in exchange for imports of clothing. By using its resources more efficiently and trading with the rest of the world, Japan was able to realize static gains from specialization that equaled 8–9 percent of its gross domestic product at that time. Of course, the long-run gains to Japan of improving its productivity and acquiring better technology were several times this figure.⁵

However, when a country initially opens to trade and then trade is eliminated, it suffers static losses, as seen in the case of the United States. In the early 1800s, Britain and France were at war. As part of the conflict, the countries attempted to prevent the shipping of goods to each other by neutral countries, notably the United States. This policy resulted in the

⁵D. Bernhofen and J. Brown, "An Empirical Assessment of the Comparative Advantage Gains from Trade: Evidence from Japan," *The American Economic Review*, March 2005, pp. 208–225.

British and French navies confiscating American ships and cargo. To discourage this harassment, in 1807 President Thomas Jefferson ordered the closure of America's ports to international trade: American ships were prevented from taking goods to foreign ports and foreign ships were prevented from taking on any cargo in the United States. The intent of the embargo was to inflict hardship on the British and French, and discourage them from meddling in America's affairs. Although the embargo did not completely eliminate trade, the United States was as close to autarky as it had ever been in its history. Therefore, Americans shifted production away from previously exported agricultural goods (the goods of comparative advantage) and increased production of import-replacement manufactured goods (the goods of comparative disadvantage). The result was a less efficient utilization of America's resources. Overall, the embargo cost about 8 percent of America's gross national product in 1807. It is no surprise that the embargo was highly unpopular among Americans and, therefore, terminated in 1809.⁶

INTERNATIONAL TRADE APPLICATION

Babe Ruth and the Principle of Comparative Advantage

Babe Ruth was the first great home run hitter in baseball history. His batting talent and vivacious personality attracted huge crowds wherever he played. He made baseball more exciting by establishing home runs as a common part of the game. Ruth set many major league records, including 2,056 career walks and 72 games in which he hit two or more home runs. He had a .342 lifetime batting average and 714 career home runs.



George Herman Ruth (1895–1948) was born in Baltimore. After playing baseball in the minor leagues, Ruth started his major league career as a left-handed pitcher with the Boston Red Sox in 1914. In 158 games for Boston, he compiled a pitching record of 89 wins and 46 losses, including two 20-win seasons—23 victories in 1916 and 24 victories in 1917.

On January 2, 1920, a little more than a year after Babe Ruth had pitched two victories in the Red Sox World Series victory over Chicago, he became violently ill. Most suspected that Ruth, known for his partying excesses, simply had a major league hangover from his New Year's celebrations. The truth was, Ruth had ingested several bad frankfurters while entertaining youngsters the day before, and his symptoms were misdiagnosed as being life-threatening. The Red Sox management, already strapped

for cash, thus sold its ailing player to the Yankees the next day for \$125,000 and a \$300,000 loan to the owner of the Red Sox.

Ruth eventually added five more wins as a hurler for the New York Yankees and ended his pitching career with a 2.28 earned run average. Ruth also had three wins against no losses in World Series competition, including one stretch of $29\frac{2}{3}$ consecutive scoreless innings. At the time, Ruth was one of the best left-handed pitchers in the American league.

Although Ruth had an absolute advantage in pitching, he had even greater talent at the plate. Simply put, Ruth's comparative advantage was in hitting. As a pitcher, Ruth had to rest his arm between appearances and thus could not bat in every game. To ensure his daily presence in the lineup, Ruth gave up pitching to play exclusively in the outfield.

In his 15 years with the Yankees, Ruth dominated professional baseball. He teamed with Lou Gehrig to form what became the greatest one-two hitting punch in baseball. Ruth was the heart of the 1927 Yankees, a team regarded by some baseball experts as the best in baseball history. That year, Ruth set a record of 60 home runs. At that time, a season had 154 games compared to 162 games today. He attracted so many fans that Yankee

(continued)

⁶D. Irwin, *The Welfare Cost of Autarky: Evidence from the Jeffersonian Trade Embargo, 1807–1809* (Cambridge, MA) Working Paper No. W8692, December 2001.

Stadium, which opened in 1923, was nicknamed “The House That Ruth Built.” The Yankees released Ruth after the 1934 season, and he ended his playing career in 1935 with the Boston Braves. In Ruth’s final game, he hit three home runs.

The advantages to having Ruth switch from pitching to batting were enormous. Not only did the Yankees win four World Series during Ruth’s tenure, but they also became baseball’s most renowned franchise. Ruth was elected

to the Baseball Hall of Fame in Cooperstown, New York, in 1936.

What do you think? How did Babe Ruth’s baseball career relate to the principle of comparative advantage?

Sources: Edward Scahill, “Did Babe Ruth Have a Comparative Advantage as a Pitcher?” *Journal of Economic Education*, Vol. 21, 1990. See also, Paul Rosenthal, “America at Bat: Baseball Stuff and Stories,” *National Geographic*, 2002; Geoffrey Ward and Ken Burns, *Baseball: An Illustrated History* (New York: Knopf, 1994); and Keith Brandt, *Babe Ruth: Home Run Hero* (Mahwah, NJ: Troll, 1986).

Consumption Gains from Trade

In the absence of trade, the consumption alternatives of the United States and Canada are limited to points *along* their domestic production possibilities frontiers. The exact consumption point for each nation will be determined by the tastes and preferences in each country. But with specialization and trade, the two nations can achieve post-trade consumption points *outside* their domestic production possibilities frontiers; that is, they can consume more wheat and more autos than they could consume in the absence of trade. Thus, trade can result in **consumption gains** for both countries.

The set of post-trade consumption points that a nation can achieve is determined by the rate at which its export product is traded for the other country’s export product. This rate is known as the **terms of trade**. The terms of trade defines the relative prices at which two products are traded in the marketplace.

Under constant-cost conditions, the slope of the production possibilities frontier defines the domestic rate of transformation (domestic terms of trade) that represents the relative prices for which two commodities can be exchanged at home. For a country to consume at some point *outside* its production possibilities frontier, it must be able to exchange its export good internationally at terms of trade more favorable than the domestic terms of trade.

Assume that the United States and Canada achieve a terms of trade ratio that permits both trading partners to consume at some point outside their respective production possibilities frontiers (Figure 2.1). Suppose that the terms of trade agreed on is a 1:1 ratio, whereby 1 auto is exchanged for 1 bushel of wheat. Based on these conditions, let line *tt* represent the international terms of trade for both countries. This line is referred to as the **trading possibilities line** (note that it is drawn with a slope having an absolute value of one).

Suppose now that the United States decides to export 60 autos to Canada. Starting at post-specialization production point *B* in the figure, the United States will slide along its trading possibilities frontier until point *C* is reached. At point *C*, 60 autos will have been exchanged for 60 bushels of wheat, at the terms of trade ratio of 1:1. Point *C* then represents the U.S. *post-trade consumption point*. Compared with consumption point *A*, point *C* results in a consumption gain for the United States of 20 autos and 20 bushels of wheat. The triangle *BCD* that shows the U.S. exports (along the horizontal axis), imports (along the vertical axis), and terms of trade (the slope) is referred to as the **trade triangle**.

Does this trading situation provide favorable results for Canada? Starting at post-specialization production point *B'* in the figure, Canada can import 60 autos from the United States by giving up 60 bushels of wheat. Canada would slide along its trading possibilities frontier until it reaches point *C'*. Clearly, this is a more favorable consumption point than

point A' . With trade, Canada experiences a consumption gain of 20 autos and 20 bushels of wheat. Canada's trade triangle is denoted by $B'C'D'$. In our two-country model, the trade triangles of the United States and Canada are identical; one country's exports equal the other country's imports that exchange at the equilibrium terms of trade. Table 2.4(b) on page 36 summarizes the consumption gains from trade for each country and the world as a whole.

One implication of the foregoing trading example is that the United States produced only autos, whereas Canada produced only wheat—that is, **complete specialization** occurs. As the United States increases and Canada decreases the production of autos, both countries' unit production costs remain constant. Because the relative costs never become equal, the United States does not lose its comparative advantage, nor does Canada lose its comparative disadvantage. The United States, therefore, produces only autos. Similarly, as Canada produces more wheat and the United States reduces its wheat production, both nations' production costs remain the same. Canada produces only wheat without losing its advantage to the United States.

The only exception to complete specialization would occur if one of the countries, say Canada, is too small to supply the United States with all of its need for wheat. Canada would be completely specialized in its export product, wheat, while the United States (large country) would produce both goods; however, the United States would still export autos and import wheat.

Distributing the Gains from Trade

Our trading example assumes that the terms of trade agreed to by the United States and Canada will result in both benefiting from trade. But where will the terms of trade actually lie?

A shortcoming of Ricardo's principle of comparative advantage is its inability to determine the actual terms of trade. The best description that Ricardo could provide was only the *outer limits* within which the terms of trade would fall. This is because the Ricardian theory relied solely on domestic cost ratios (supply conditions) in explaining trade patterns; it ignored the role of demand.

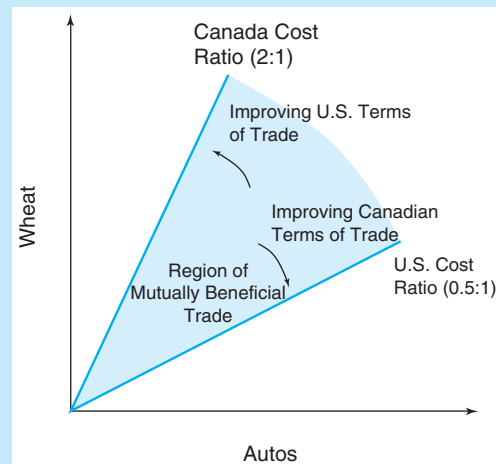
To visualize Ricardo's analysis of the terms of trade, recall our trading example of Figure 2.1. We assumed that, for the United States, the relative cost of producing an additional auto was 0.5 bushel of wheat, whereas, for Canada, the relative cost of producing an additional auto was 2 bushels of wheat. Thus, the United States has a comparative advantage in autos, whereas Canada has a comparative advantage in wheat. Figure 2.2 illustrates these domestic cost conditions for the two countries. However, for each country, we have translated the domestic cost ratio, given by the negatively sloped production possibilities frontier, into a *positively sloped* cost-ratio line.

According to Ricardo, the domestic cost ratios set the **outer limits for the equilibrium terms of trade**. If the United States is to export autos, it should not accept any terms of trade less than a ratio of 0.5:1, indicated by its domestic cost-ratio line. Otherwise, the U.S. post-trade consumption point would lie inside its production possibilities frontier. The United States would clearly be better off without trade than with trade. The U.S. domestic cost-ratio line therefore becomes its **no-trade boundary**. Similarly, Canada would require a minimum of 1 auto for every 2 bushels of wheat exported, as indicated by its domestic cost-ratio line; any terms of trade less than this rate would be unacceptable to Canada. Thus, its domestic cost-ratio line defines the no-trade boundary line for Canada.

For gainful international trade to exist, a nation must achieve a post-trade consumption location at least equivalent to its point along its domestic production possibilities frontier. Any acceptable international terms of trade has to be more favorable than or equal to the rate defined by the domestic price line. Thus, the **region of mutually beneficial trade** is bounded by the cost ratios of the two countries.

FIGURE 2.2

Equilibrium Terms of Trade Limits



The supply-side analysis of Ricardo describes the outer limits within which the equilibrium terms of trade must fall. The domestic cost ratios set the outer limits for the equilibrium terms of trade. Mutually beneficial trade for both nations occurs if the equilibrium terms of trade lies between the two nations' domestic cost ratios. According to the theory of reciprocal demand, the actual exchange ratio at which trade occurs depends on the trading partners' interacting demands.

Equilibrium Terms of Trade

As noted, Ricardo did not explain how the actual terms of trade would be determined in international trade. This gap was filled by another classical economist, John Stuart Mill (1806–1873). By bringing into the picture the intensity of the trading partners' demands, Mill could determine the actual terms of trade for Figure 2.2. Mill's theory is known as the **theory of reciprocal demand**.⁷ This theory asserts that within the outer limits of the terms of trade, the actual terms of trade is determined by the relative strength of each country's demand for the other country's product. Simply put, production costs determine the outer limits of the terms of trade, while reciprocal demand determines what the actual terms of trade will be within those limits.

Referring to Figure 2.2, if Canadians are more eager for U.S. autos than Americans are for Canadian wheat, the terms of trade would end up close to the Canadian cost ratio of 2:1. Thus, the terms of trade would improve for the United States. However, if Americans are more eager for Canadian wheat than Canadians are for U.S. autos, the terms of trade would fall close to the U.S. cost ratio of 0.5:1 and the terms of trade would improve for Canadians.

The reciprocal-demand theory best applies when both nations are of equal economic size, so that the demand of each nation has a noticeable effect on market price. However, if two nations are of unequal economic size, it is possible that the relative demand strength of the smaller nation will be dwarfed by that of the larger nation. In this case, the domestic exchange ratio of the larger nation will prevail. Assuming the absence of monopoly

⁷John Stuart Mill, *Principles of Political Economy* (New York: Longmans, Green, 1921), pp. 584–585.

elements working in the markets, the small nation can export as much of the commodity as it desires, enjoying large gains from trade.

Consider trade in crude oil and autos between Venezuela and the United States before the rise of the Organization of Petroleum Exporting Countries (OPEC). Venezuela, as a small nation, accounted for only a very small share of the U.S.–Venezuelan market, whereas the U.S. market share was overwhelmingly large. Because Venezuelan consumers and producers had no influence on market price levels, they were in effect price takers. In trading with the United States, no matter what the Venezuelan demand was for crude oil and autos, it was not strong enough to affect U.S. price levels. As a result, Venezuela traded according to the U.S. domestic price ratio, buying and selling autos and crude oil at the price levels that existed in the United States.

The example just given implies the following generalization: If two nations of approximately the *same size* and with similar taste patterns participate in international trade, the gains from trade will be shared about *equally* between them. However, if one nation is significantly *larger* than the other, the larger nation attains *fewer* gains from trade while the *smaller* nation attains *most* of the gains from trade. This situation is characterized as the **importance of being unimportant**. What's more, when nations are very dissimilar in size, there is a strong possibility that the larger nation will continue to produce its comparative-disadvantage good because the smaller nation is unable to supply all of the world's demand for this product.

Terms of Trade Estimates

As we have seen, the terms of trade affect a country's gains from trade. How are the terms of trade actually measured?

The **commodity terms of trade** (also referred to as the *barter terms of trade*) is a frequently used measure of the international exchange ratio. It measures the relation between the prices a nation gets for its exports and the prices it pays for its imports. This is calculated by dividing a nation's export price index by its import price index, multiplied by 100 to express the terms of trade in percentages:

$$\text{Terms of Trade} = \frac{\text{Export Price Index}}{\text{Import Price Index}} \times 100$$

An *improvement* in a nation's terms of trade requires that the prices of its exports rise relative to the prices of its imports over the given time period. A smaller quantity of export goods sold abroad is required to obtain a given quantity of imports. Conversely, *deterioration* in a nation's terms of trade is due to a rise in its import prices relative to its export prices over a time period. The purchase of a given quantity of imports would require the sacrifice of a greater quantity of exports.

Table 2.5 gives the commodity terms of trade for selected countries. With 2000 as the base year (equal to 100), the table shows that by 2015 the U.S. index of export prices rose to 193, an increase of 93 percent. During the same period, the index of U.S. import prices rose by 83 percent, to a level of 183. Using the terms of trade formula, we find that the U.S. terms of trade *improved* by 5 percent $[(193/183) \times 100 = 105]$ over the period 2000–2015. This means that to purchase a given quantity of imports, the United States had to sacrifice 5 percent *fewer* exports; conversely, for a given number of exports, the United States could obtain 5 percent *more* imports.

Although changes in the commodity terms of trade indicate the direction of movement of the gains from trade, their implications must be interpreted with caution. Suppose there is an increase in the foreign demand for U.S. exports, leading to higher prices and revenues for U.S. exporters. In this case, an improving terms of trade implies that the U.S. gains from

TABLE 2.5

Commodity Terms of Trade, 2015 (2000 = 100)

Country	Export Price Index	Import Price Index	Terms of Trade
Germany	242	212	114
Brazil	347	305	114
United States	193	183	105
Australia	295	291	101
Argentina	216	238	91
United Kingdom	162	180	90
Canada	148	178	83
Japan	130	171	76

Sources: From International Monetary Fund, *IMF Financial Statistics*, Washington, DC, January 2017. See also World Bank, *Export Value Index (2000 = 100)* at <http://data.worldbank.org/indicator> and *Import Value Index (2000 = 100)* at <http://data.worldbank.org/indicator>.

trade have increased. However, suppose that the cause of the rise in export prices and terms of trade is the falling *productivity* of U.S. workers. If these result in reduced export sales and less revenue earned from exports, we could hardly say that U.S. welfare has improved. Despite its limitations, however, the commodity terms of trade is a useful concept. Over a long period, it illustrates how a country's share of the world gains from trade changes and gives a rough measure of the fortunes of a nation in the world market.

Dynamic Gains from Trade: Economic Growth

The previous analysis of the gains from international trade stressed specialization and reallocation of *existing* resources—the so called static gains from specialization. However, these gains can be dwarfed by the effect of trade on the country's growth rate and the volume of additional resources made available to, or utilized by, the trading country. These are known as the **dynamic gains from international trade** as opposed to the static effects of reallocating a fixed quantity of resources. Dynamic gains from trade can arise from increased investment in equipment and manufacturing plants, economies of large-scale production, and increased competition that occurs over a period of time. Also, the Internet is a source of the dynamic gains from trade, as explained below.

The Internet has become an important part of many countries' economic infrastructures. It affects how people shop, how products and services are designed, developed, marketed, and delivered, and how businesses operate and interact with one another. Commerce in products and services delivered via the Internet, known as **digital trade**, has dramatically grown as a result of the widespread use of the Internet and Internet-based technologies. For example, Amazon, Apple, Facebook, Google, and Microsoft have all expanded both the range of online products and services they offer and the types of online economic activities in which they engage.

Digital trade has assumed many forms, ranging from ordering merchandise through online platforms to video streaming. The delivery of digital products such as movies, music, e-books, video games, and software is part of digital trade. Also, the Internet can facilitate the delivery of services such as the sending of legal briefs, consulting reports, or architectural and engineering designs to a foreign customer. Moreover, digital trade arises when customers throughout the world order products through dealers such as eBay or Amazon. Finally, the Internet has resulted in companies decreasing trade costs of exports and imports

by allowing them to track inventory and coordinate delivery times, thus decreasing losses in shipment. Simply put, digital trade has not altered the “why” of international trade, which is founded on the principle of comparative advantage, but it is transforming how trade is conducted.

The efficiency gains that digital trade provide for economies are not a one-time occurrence but an ongoing process that fosters long-run economic growth. By decreasing costs, promoting competition, and increasing markets, digital trade results in continuing increases in productivity. Also, by enabling the spread of collaboration and ideas, digital trade promotes product innovation.

For the United States, digital trade plays to its comparative advantage. The United States remains the global leader in developing digital products and online platforms and exporting digital services. By reflecting America’s competitive strengths, digital trade permits the nation to use its resources in ways that permanently increase its national output and standard of living.

Much of the gains from digital trade have accrued to small and medium-sized American companies. Unlike America’s Fortune 500 companies, smaller companies are not able to easily establish a physical presence abroad or invest in the systems needed to operate a global enterprise. Instead, the Internet has permitted smaller companies to reach foreign customers through their websites and online platforms such as Amazon. The Internet has also helped smaller companies advertise their prices to foreign buyers and to source components in foreign markets, thus allowing them to control costs and boost their competitiveness. Therefore, America’s smaller and medium-sized companies are participating in international trade as never before.

However, digital trade has challenges as concerns over data privacy and cyber theft have become widespread. Also, nations throughout the world have imposed trade barriers that limit digital trade: for example, policies that require the in-country location of data servers, policies that require local content or technologies and government procurement preferences, and standards that favor local companies.⁸

Changing Comparative Advantage

Although international trade can promote dynamic gains in terms of increased productivity, patterns of comparative advantage can and do change over time. In the early 1800s, the United Kingdom had a comparative advantage in textile manufacturing. Then that advantage shifted to the New England states of the United States. Then the comparative advantage shifted once again to North Carolina and South Carolina. Now the comparative advantage resides in China and other low-wage countries. Let us see how changing comparative advantage relates to our trade model.

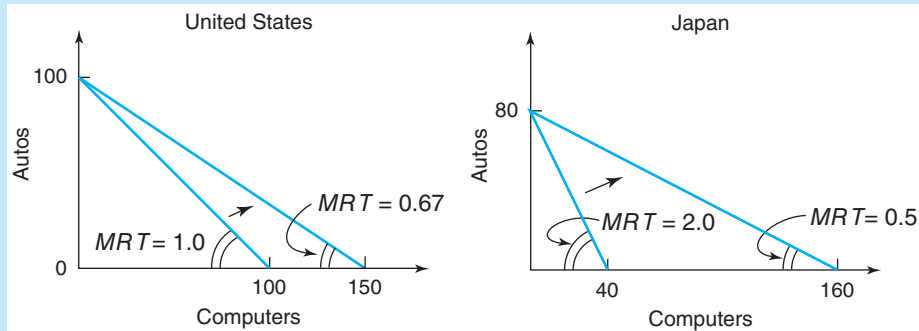
Figure 2.3 illustrates the production possibilities frontiers, for computers and automobiles, of the United States and Japan under conditions of constant opportunity cost. Note that the MRT of automobiles into computers initially equals 1.0 for the United States and 2.0 for Japan. The United States thus has a comparative advantage in the production of computers and a comparative disadvantage in auto production.

Suppose both nations experience productivity increases in manufacturing computers but no productivity change in manufacturing automobiles. Assume that the United States increases its computer manufacturing productivity by 50 percent (from 100 to

⁸Daniel Griswold, *The Dynamic Gains from Free Digital Trade for the U.S. Economy*, U.S. Congress Joint Economic Committee, Public Hearing, September 12, 2017; Rachel Fefer, Shayerah Akhtar, and Wayne Morrison, *Digital Trade and U.S. Trade Policy*, Congressional Research Service, Washington, DC, June 6, 2017; James Stamps and Martha Lawless, *Digital Trade in the U.S. and Global Economies, Part 1*, U.S. I

FIGURE 2.3

Changing Comparative Advantage



If productivity in the Japanese computer industry grows faster than it does in the U.S. computer industry, the opportunity cost of each computer produced in the United States increases relative to the opportunity cost of the Japanese. For the United States, comparative advantage shifts from computers to autos.

150 computers) but that Japan increases its computer manufacturing productivity by 300 percent (from 40 to 160 computers).

Because of these productivity gains, the production possibilities frontier of each country rotates outward and becomes flatter. More output can now be produced in each country with the same amount of resources. Referring to the new production possibilities frontiers, the MRT of automobiles into computers equals 0.67 for the United States and 0.5 for Japan. The comparative cost of a computer in Japan has thus fallen below that in the United States. For the United States, the consequence of lagging productivity growth is that it loses its comparative advantage in computer production. But even after Japan achieves comparative advantage in computers, the United States still has a comparative advantage in autos; the change in manufacturing productivity thus results in a change in the direction of trade. The lesson of this example is that producers who fall behind in research and development, technology, and equipment tend to find their competitiveness dwindling.

It should be noted, however, that all countries realize a comparative advantage in some product or service. For the United States, the growth of international competition in industries such as steel may make it easy to forget that the United States continues to be a major exporter of aircraft, paper, instruments, plastics, and chemicals.

To cope with changing comparative advantages, producers are under constant pressure to reinvent themselves. Consider how the U.S. semiconductor industry responded to competition from Japan in the late 1980s. Japanese companies quickly became dominant in sectors such as memory chips. This dominance forced the big U.S. chip makers to reinvent themselves. Firms such as Intel, Motorola, and Texas Instruments abandoned the dynamic-random-access-memory (DRAM) business and invested more heavily in manufacturing microprocessors and logic products, the next wave of growth in semiconductors. Intel became an even more dominant player in microprocessors, while Texas Instruments developed a strong position in digital signal processors, the “brain” in mobile telephones. Motorola gained strength in microcontrollers and automotive semiconductors. A fact of economic life is that no producer can remain the world’s low-cost producer forever. As comparative advantages change, producers need to hone their skills to compete in more profitable areas.

INTERNATIONAL TRADE APPLICATION

Natural Gas Boom Fuels Debate

Natural gas provides an example of comparative advantage, as discussed below.

Natural gas is nothing new. Its origins date back to about 1000 B.C. when a goat herdsman in Greece came across a flame rising from a fissure in rock on Mount Parnassus. The Greeks, believing it was divine origin or supernatural, built a temple on the flame. It wasn't until about 500 B.C. that the Chinese discovered that the source of the flame was natural gas seeping to the earth's surface. The Chinese made crude pipelines out of bamboo shoots to transport the gas, where it was used to boil sea water, separating the salt and making the water drinkable. Around 1785 Britain became the first country to commercialize the use of natural gas that was produced from coal and could be used to light houses and streetlights.



In the United States, the natural gas industry has existed for over 100 years. The United States has exported some natural gas during this period of time, but has generally imported more than it has exported, mostly from Canada. However, this trend began to change around 2010 when new sources of natural gas were found in the United States, particularly from shale gas. Technologies were developed (hydraulic fracturing and horizontal drilling) that allowed water, sand, and chemicals to create fissures in shale, allowing trapped natural gas to be cost-effectively extracted. Suddenly the United States increased its ability to produce natural gas.

The natural gas bonanza helped lower U.S. energy prices and resulted in U.S. producers being poised to ship vast quantities of gas overseas. However, federal law requires the U.S. Department of Energy to determine that natural gas projects are in the public interest before granting export permits to countries that do not have free-trade agreements with the United States. As producers such as Exxon Mobil sought federal permits for export projects, a debate ensued over whether they should be allowed to expand their exports.

Industry proponents argue that natural gas exports provide a much needed source of energy to American trading partners and foster economic growth and jobs in

the United States. They are eager to take advantage of higher prices in foreign markets. Industry experts acknowledge that although many countries are endowed with large shale reserves, most countries are several years behind the United States in extraction and exploration. Moreover, proponents maintain that expanded exports of natural gas are a boost to key U.S. allies, especially Japan, as it transitions away from nuclear power.

However, environmentalists contend that natural gas still leaves a significant carbon footprint: A global interest in U.S. natural gas means an extended reliance on fossil fuels and the delay of the shift to clean-tech energy such as solar power or wind power. They also are concerned about the environmental damage from drilling techniques used in the extraction of natural gas from shale that can harm drinking water.

What effect exporting natural gas will have on U.S. prices is another vital question in the debate over whether to export. A significant increase in U.S. natural gas exports would likely impose upward pressure on domestic prices, but the extent of any rise is unclear. There are a variety of factors that affect prices, such as economic growth rates, differences in local markets, and government regulations. Producers contend that increased exports will not increase prices significantly because there is ample supply to meet domestic demand, and there will be the extra benefits of increased revenues, trade, and jobs. Consumers of natural gas who are helped by low prices, fear prices will rise if natural gas is exported.

At the writing of this text, it remains to be seen how the effects of increased natural gas exports will play out.

What do you think? Do you feel that natural gas should be exported by the United States?

Sources: Michael Ratner, and others, *U.S. Natural Gas Exports: New Opportunities, Uncertain Outcomes*, Congressional Research Service, Washington, DC, January 28, 2015; Gary Hufbauer, Allie Bagnall, and Julia Muir, *Liquefied Natural Gas Exports: An Opportunity for America*, Peterson Institute for International Economics, February 2013; and Robert Pirog and Michael Ratner, *Natural Gas in the U.S. Economy: Opportunities for Growth*, Congressional Research Service, Washington, DC, November 6, 2012.

Trading under Increasing-Cost Conditions

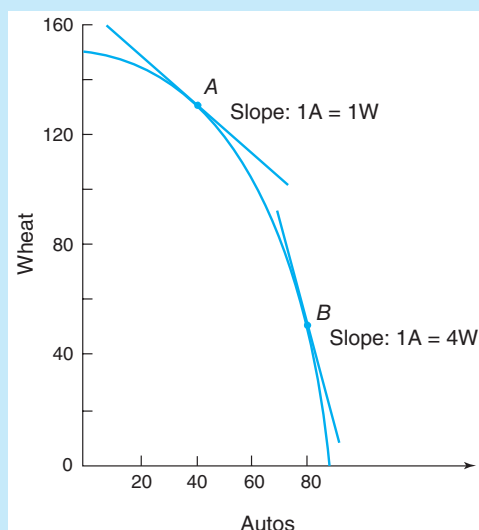
The preceding section illustrated the comparative advantage principle under constant-cost conditions. In the real world, a good's opportunity cost may *increase* as more of it is produced. Based on studies of many industries, economists think the opportunity costs of production increase with output rather than remain constant for most goods. The principle of comparative advantage must be illustrated in a modified form.

Increasing opportunity costs give rise to a production possibilities frontier that appears bowed outward from the diagram's origin. In Figure 2.4, with movement along the production possibilities frontier from *A* to *B*, the opportunity cost of producing autos becomes larger in terms of wheat sacrificed. Increasing costs mean that the MRT of wheat into autos *rises* as more autos are produced. Remember that the MRT is measured by the absolute slope of the production possibilities frontier at a given point. With movement from production point *A* to production point *B*, the respective tangent lines become *steeper*—their slopes increase in absolute value. The MRT of wheat into autos rises, indicating that each additional auto produced requires the sacrifice of increasing amounts of wheat.

Increasing costs represent the typical case in the real world. In the overall economy, increasing costs result when inputs are imperfect substitutes for each other. As auto production rises and wheat production falls in Figure 2.4, inputs that are less adaptable to autos are introduced into that line of production. To produce more autos requires more of such resources and thus an increasingly greater sacrifice of wheat. For a *particular product*, such as autos, increasing cost is explained by the principle of diminishing marginal productivity. The addition of successive units of labor (variable input) to capital (fixed input) beyond

FIGURE 2.4

Production Possibilities Frontier under Increasing-Cost Conditions



Increasing opportunity costs lead to a production possibilities frontier that is bowed outward, viewed from the diagram's origin. The marginal rate of transformation equals the (absolute) slope of the production possibilities frontier at a particular point along the frontier.

some point results in decreases in the marginal production of autos that is attributable to each additional unit of labor. Unit production costs thus rise as more autos are produced.

Under increasing costs, the slope of the production possibilities frontier varies as a nation locates at different points on the frontier. Because the MRT equals the production possibilities frontier's slope, it will also be different for each point on the frontier. In addition to considering the *supply factors* underlying the production possibilities frontier's slope, we must also take into account the demand factors (tastes and preferences) for they will determine the point along the production possibilities frontier at which a country chooses to consume.

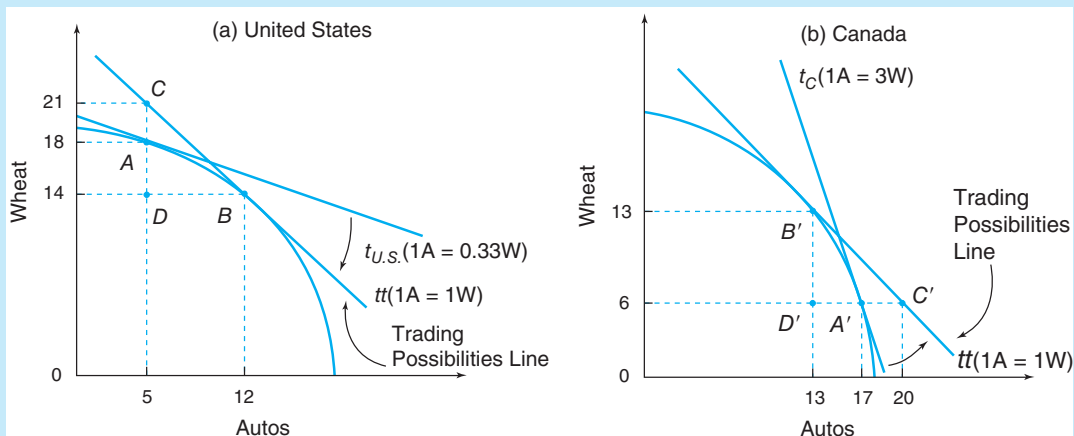
Increasing-Cost Trading Case

Figure 2.5 shows the production possibilities frontiers of the United States and Canada under conditions of increasing costs. In Figure 2.5(a), assume that in the absence of trade the United States is located at point A along its production possibilities frontier; it produces and consumes 5 autos and 18 bushels of wheat. In Figure 2.5(b), assume that, in the absence of trade, Canada is located at point A' along its production possibilities frontier, producing and consuming 17 autos and 6 bushels of wheat. For the United States, the relative cost of wheat into autos is indicated by the slope of line $t_{U.S.}$, tangent to the production possibilities frontier at point A (1 auto = 0.33 bushel of wheat). In like manner, Canada's relative cost of wheat into autos is indicated by the slope of line t_C (1 auto = 3 bushels of wheat). Because line $t_{U.S.}$ is flatter than line t_C , autos are relatively cheaper in the United States and wheat is relatively cheaper in Canada. According to the law of comparative advantage, the United States will export autos and Canada will export wheat.

As the United States specializes in auto production it slides downward along its production possibilities frontier from point A toward point B. The relative cost of autos (in terms of wheat) rises, as implied by the increase in the (absolute) slope of the production

FIGURE 2.5

Trading under Increasing Opportunity Costs



With increasing opportunity costs, comparative product prices in each country are determined by both supply and demand factors. A country tends to partially specialize in the product of its comparative advantage under increasing-cost conditions.

possibilities frontier. At the same time, Canada specializes in wheat. As Canada moves upward along its production possibilities frontier from point A' toward point B' , the relative cost of autos (in terms of wheat) decreases, as evidenced by the decrease in the (absolute) slope of its production possibilities frontier.

The process of specialization continues in both nations until the relative cost of autos is identical in both nations and U.S. exports of autos are precisely equal to Canada's imports of autos, and conversely for wheat. Assume that this situation occurs when the domestic rates of transformation (domestic terms of trade) of both nations converge at the rate given by line tt . At this point of convergence, the United States produces at point B , while Canada produces at point B' . Line tt becomes the international terms of trade line for the United States and Canada; this point coincides with each nation's domestic terms of trade. The international terms of trade are favorable to both nations because tt is steeper than $t_{U.S.}$ and flatter than t_C .

What are the *production gains* from specialization for the United States and Canada? Comparing the amount of autos and wheat produced by the two nations at their points prior to specialization with the amount produced at their post-specialization production points we see that there are gains of 3 autos and 3 bushels of wheat. The production gains from specialization are shown in Table 2.6(a).

TABLE 2.6**Gains from Specialization and Trade: Increasing Opportunity Costs****(a) Production Gains from Specialization**

	BEFORE SPECIALIZATION		AFTER SPECIALIZATION		NET GAIN (LOSS)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	5	18	12	14	7	-4
Canada	17	6	13	13	-4	7
World	22	24	25	27	3	3

(b) Consumption Gains from Trade

	BEFORE TRADE		AFTER TRADE		NET GAIN (LOSS)	
	Autos	Wheat	Autos	Wheat	Autos	Wheat
United States	5	18	5	21	0	3
Canada	17	6	20	6	3	0
World	22	24	25	27	3	3

What are the *consumption gains* from trade for the two nations? With trade, the United States can choose a consumption point along international terms of trade line tt . Assume that the United States prefers to consume the same number of autos as it did in the absence of trade. It will export 7 autos for 7 bushels of wheat, achieving a post-trade consumption point at C . The U.S. consumption gains from trade are 3 bushels of wheat, as shown in Figure 2.5(a) and also in Table 2.6(b). The U.S. *trade triangle*, showing its exports, imports, and terms of trade, is denoted by triangle BCD .

In like manner, Canada can choose to consume at some point along international terms of trade line tt . Assuming Canada holds constant its consumption of wheat, it will export 7 bushels of wheat for 7 autos and wind up at post-trade consumption point C' . Its consumption gain of 3 autos is also shown in Table 2.6(b). Canada's *trade triangle* is depicted in Figure 2.5(b) by triangle $B'C'D'$. Note that Canada's trade triangle is identical to that of the United States.

In this chapter, we discussed the autarky points and post-trade consumption points for the United States and Canada by assuming “given” tastes and preferences (demand conditions) of the consumers in both countries. In *Exploring Further 2.2*, located in MindTap, we introduce indifference curves to show the role of each country’s tastes and preferences in determining the autarky points and how gains from trade are distributed. Also, for a presentation of offer curves and the equilibrium terms of trade, go to *Exploring Further 2.3*, located in MindTap.

Partial Specialization

One feature of the increasing cost model analyzed here is that trade generally leads each country to specialize only partially in the production of the good in which it has a comparative advantage. The reason for **partial specialization** is that increasing costs constitute a mechanism that forces costs in two trading nations to converge. When cost differentials are eliminated, the basis for further specialization ceases to exist.

Figure 2.5 assumes that prior to specialization the United States has a comparative cost advantage in producing autos, whereas Canada is relatively more efficient at producing wheat. With specialization, each country produces more of the commodity of its comparative advantage and less of the commodity of its comparative disadvantage. Given increasing-cost conditions, unit costs rise as both nations produce more of their export commodities. Eventually, the cost differentials are eliminated, at which point the basis for further specialization ceases to exist.

When the basis for specialization is eliminated, there exists a strong probability that both nations will produce some of each good. This is because costs often rise so rapidly that a country loses its comparative advantage vis-à-vis the other country before it reaches the endpoint of its production possibilities frontier. In the real world of increasing-cost conditions, partial specialization is a likely result of trade.

Another reason for partial specialization is that not all goods and services are traded internationally. For example, even if Germany has a comparative advantage in medical services, it would be hard for Germany to completely specialize in medical services and export them. It would be very difficult for American patients who require back surgeries to receive them from surgeons in Germany.

Differing tastes for products also result in partial specialization. Most products are differentiated. Compact disc players, digital music players, automobiles, and other products provide a variety of features. When purchasing automobiles, some people desire capacity to transport seven passengers while others desire good gas mileage and attractive styling. Thus, some buyers prefer Ford Expeditions and others prefer Honda CRVs. Simply put, the United States and Japan have comparative advantages in manufacturing different types of automobiles.

The Impact of Trade on Jobs

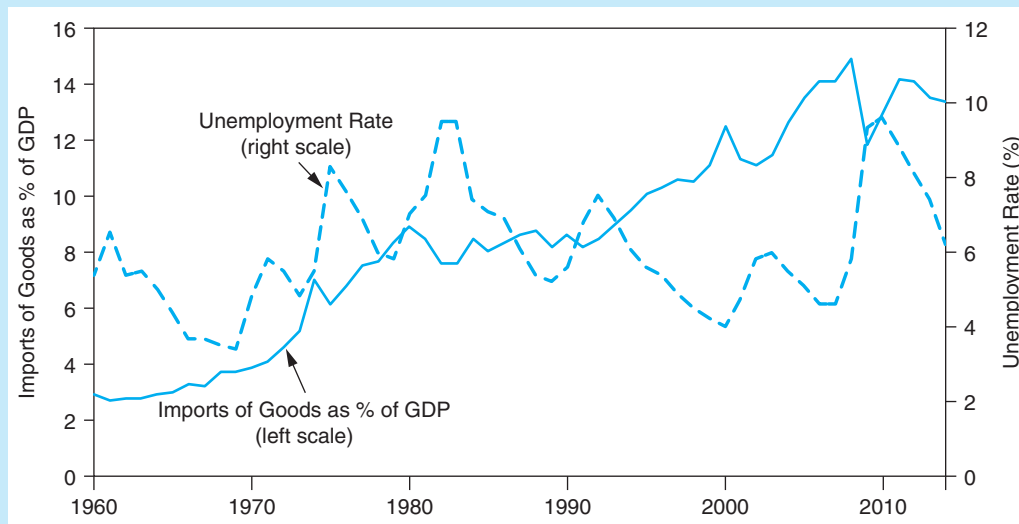
As Americans watch the evening news on television and see Chinese workers producing goods that they used to produce, the viewers might conclude that international trade results in an overall loss of jobs for Americans. Is this true?

Standard trade theory suggests that the extent to which an economy is open influences the *mix* of jobs within an economy and can cause dislocation in certain areas or industries, but has little effect on the *overall* level of employment. The main determinants of total employment are factors such as the available workforce, total spending in the economy, and the regulations that govern the labor market.

According to the principle of comparative advantage, trade tends to lead a country to specialize in producing goods and services at which it excels. Trade influences the mix of

jobs because workers and capital are expected to shift away from industries in which they are less productive relative to foreign producers and toward industries having a comparative advantage.

The conclusion that international trade has little impact on the overall number of jobs is supported by data on the U.S. economy. If trade is a major determinant on the nation's ability to maintain full employment, measures of the amount of trade and unemployment would move in unison, but in fact, they generally do not. As seen in Figure 2.6, the increase in U.S. imports as a percentage of GDP over the past several decades has not led to any significant trend in the overall unemployment rate for Americans.

FIGURE 2.6**The Impact of Trade on Jobs**

Increased international trade tends to neither inhibit overall job creation nor contribute to an increase in the overall rate of unemployment. As seen in the figure, the increase in U.S. imports of goods as a percentage of GDP over the past several decades has not led to any significant trend in the overall unemployment for Americans.

Indeed, the United States has been able to achieve relatively low unemployment while imports have grown considerably.

Simply put, increased trade has neither inhibited overall job creation nor contributed to an increase in the overall rate of unemployment. This topic will be further examined in Chapter 10 in the essay entitled “Do Current Account Deficits Cost Americans Jobs?”

Wooster, Ohio Bears the Brunt of Globalization

According to the principle of comparative advantage, although free trade tends to move resources from low productivity to high productivity, some people can be left behind. Consider the case of Rubbermaid's exit from Wooster, Ohio.

Rubbermaid is an American producer of household items such as food storage containers, trash cans, laundry baskets, and the like. The company was founded in 1933 in

Wooster when James Caldwell received a patent for his red rubber dustpan. Soon the company was producing a variety of rubber and plastic kitchen products under the name Rubbermaid.

A solid corporate citizen, Rubbermaid donated to the arts, initiated a downtown revitalization by opening a retail store and led a drive to convert an old movie theater into a cultural center. Also, it was designated as one of America's most admired companies. Although workers on Rubbermaid's factory floors were not getting wealthy, work was plentiful and it was common to find three generations of a family on the payroll.

However, trouble began for Rubbermaid in 1995 when the firm was dealing with skyrocketing prices for resin, a key ingredient in plastic products. In that year, the firm lost \$250 million, mainly because of resin price hikes. When Rubbermaid tried to pass a higher price for its plastic products on to Walmart, which accounted for about 20 percent of its business, Walmart warned that if prices rose it would pull Rubbermaid's products from its shelves. When negotiations failed, Walmart terminated the relationship and turned to other suppliers; generally foreign companies with lower labor costs. This resulted in Rubbermaid's profits plunging by 30 percent in 1995, the closing of nine of its manufacturing plants, and laying off 10 percent of its workers, the first major downsizing in its history.

In 1999, Rubbermaid was purchased for \$6 billion by Newell Corporation, a multinational consumer product corporation known for cost cutting; the newly merged firm was called Newell Rubbermaid Inc. Newell Rubbermaid transferred manufacturing work from Wooster's rubber division to Mexico to take advantage of lower labor costs. Rubbermaid had established manufacturing plants in Poland, South Korea, and Mexico, but most of its production remained in America. Also, the corporate staff was transferred to Atlanta, Georgia, the headquarters of Newell Rubbermaid. As a result, the work force in Wooster was cut by 1,000, while remaining workers toiled at a distribution center for Newell-Rubbermaid products. As former Rubbermaid workers depleted their modest severance packages, they tried to find new employment. Some succeeded in landing jobs, often temporary and without benefits that paid 30–40 percent less than they were earning.

The middle-class workers of Wooster believed in the American dream that if you work hard and adhere to the rules you will prosper in America and your children would enjoy a better life than yours. However, they were shaken by the loss of their major employer in a globalized economy.⁹

Comparative Advantage Extended to Many Products and Countries

In our discussion so far, we have used trading models in which only two goods are produced and consumed and trade is confined to two countries. This simplified approach has permitted us to analyze many essential points about comparative advantage and trade. The real world of international trade involves more than two products and two countries; each country produces thousands of products and trades with many countries. To move in the direction of reality, it is necessary to understand how comparative advantage functions in a world of many products and many countries. As we will see, the conclusions of comparative advantage hold when more realistic situations are encountered.

⁹Donald Barlett and James Steel, *The Betrayal of the American Dream* (New York: Public Affairs-Perseus Books Group, 2012); Huang Qingy et al., "Wal-Mart's Impact on Supplier Profits," *Journal of Marketing Research*, Vol. 49, No. 2, 2012; Richard Freeman and Arthur Ticknor, "Wal-Mart Is Not a Business: It's an Economic Disease," *Executive Intelligence Review*, November 14, 2003.

More Than Two Products

When two countries produce a large number of goods, the operation of comparative advantage requires that the goods be ranked by the degree of comparative cost. Each country exports the product(s) in which it has the greatest comparative advantage. Conversely, each country imports the product(s) in which it has the greatest comparative disadvantage.

Figure 2.7 illustrates the hypothetical arrangement of six products—chemicals, jet planes, computers, autos, steel, and semiconductors—in rank order of the comparative advantage of the United States and Japan. The arrangement implies that chemical costs are lowest in the United States relative to Japan, whereas the U.S. cost advantage in jet planes is somewhat less. Conversely, Japan enjoys its greatest comparative advantage in semiconductors.

FIGURE 2.7

Hypothetical Spectrum of Comparative Advantages for the United States and Japan



When a large number of goods are produced by two countries, operation of the comparative advantage principle requires the goods to be ranked by the degree of comparative cost. Each country exports the product(s) in which its comparative advantage is strongest. Each country imports the product(s) in which its comparative advantage is weakest.

This product arrangement clearly indicates that with trade, the United States will produce and export chemicals and that Japan will produce and export semiconductors. Where will the cutoff point lie between what is exported and what is imported? Between computers and autos? Or will Japan produce computers and the United States produce only chemicals and jet planes? Will the cutoff point fall along one of the products rather than between them—so that computers, for example, might be produced in both Japan and the United States?

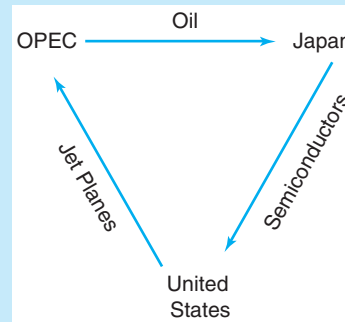
The cutoff point between what is exported and what is imported depends on the relative strength of international demand for the various products. One can visualize the products as beads arranged along a string according to comparative advantage. The strength of demand and supply will determine the cutoff point between U.S. and Japanese production. A rise in the demand for steel and semiconductors, for example, leads to price increases that move in favor of Japan. These increases lead to rising production in the Japanese steel and semiconductor industries.

More Than Two Countries

When a trading example includes many countries, the United States will find it advantageous to enter into *multilateral trading relations*. Figure 2.8 illustrates the process of multilateral trade for the United States, Japan, and OPEC. The arrows in the figure denote the directions of exports. The United States exports jet planes to OPEC, Japan imports oil from OPEC, and Japan exports semiconductors to the United States. The real world of international trade involves trading relations even more complex than this triangular example.

FIGURE 2.8

Multilateral Trade among the United States, Japan, and OPEC



When many countries are involved in international trade, the home country will likely find it advantageous to enter into multilateral trading relationships with a number of countries. This figure illustrates the process of multilateral trade for the United States, Japan, and OPEC.

This example casts doubt upon the idea that *bilateral balance* should pertain to any two trading partners. The predictable result is that a nation will realize a trade surplus (exports of goods exceed imports of goods) with trading partners that buy a lot of the things that it supplies at low cost. Also, a nation will realize a trade deficit (imports of goods exceed exports of goods) with trading partners that are low-cost suppliers of goods that it imports intensely.

Consider the trade “deficits” and “surpluses” of a dentist who likes to snow ski. The dentist can be expected to run a trade deficit with ski resorts, sporting goods stores, and favorite suppliers of services like garbage collection and medical care. Why? The dentist is highly likely to buy these items from others. On the other hand, the dentist can be expected to run trade surpluses with his patients and medical insurers. These trading partners are major purchasers of the services provided by the dentist. Moreover, if the dentist has a high rate of saving, the surpluses will substantially exceed the deficits.

The same principles are at work across nations. A country can expect to run sizable surpluses with trading partners that buy a lot of the things the country exports, while trade deficits will be present with trading partners that are low-cost suppliers of the items imported.

What would be the effect if all countries entered into bilateral trade agreements that balanced exports and imports between each pair of countries? The volume of trade and specialization would be greatly reduced and resources would be hindered from moving to their highest productivity. Although exports would be brought into balance with imports, the gains from trade would be lessened.

Factor Mobility, Exit Barriers, and Trade

Referring to Figure 2.1, recall that when the United States has a comparative advantage in autos, it will increase auto production by moving factors of production (land, labor, capital, and entrepreneurship) out of wheat production, the comparative disadvantage product, and transferring them into auto production. This process assumes that factors of production are mobile between different uses within the United States. This assumption allows

production adjustments to move smoothly along the production possibilities frontier in response to changes in relative product prices.

Factor mobility refers to the ability to move factors of production out of one production process into another. It may involve the movement of factors between firms within an industry, as when a computer company shuts down and sells its production equipment to another computer company. Also, mobility may involve the movement of factors of production across industries within a country, as when a worker leaves employment at the Aluminum Company of America (Alcoa) and takes a job at a Boeing jetliner factory. Finally, mobility may involve the movement of factors between countries either within industries or across industries, as when an American oil worker migrates to Canada to take a job at a Canadian lumber company or when Ford Motor Company establishes an auto assembly plant in Mexico.

A traditional assumption of international trade theory is that factors of production can move freely and without cost between firms within an industry and between industries within a country, but are immobile across national borders. How realistic is this assumption? Let us briefly consider its realism.

- **That factors of production can move freely within an industry within a country.** The skills acquired by workers and the productivity of capital tend to be similar across firms producing identical or closely substitutable products. This enhances the mobility of factors of production. Therefore, an auto assembly worker can switch employment from General Motors to Chrysler. Nevertheless, there tends to be transition costs involved, such as job search and moving expenses that can limit factor mobility.
- **That factors of production can easily move across industries within a country.** This assumption is questionable, especially in the short run. For example, during the early 2000s, labor-intensive manufactured goods surged into the United States from China. Thus, many American manufacturing workers lost their jobs in places such as Ohio, Michigan, and Pennsylvania. Often, these workers were older and without college educations, which limited their ability to move into jobs in other industries. It took a long time for many of them to get back on their feet, if they did at all. Some did not and they dropped out of the labor force—they were too old to retrain and move.
- **That factors of production are immobile across national borders.** Traditionally, most workers remain in their country of origin because of immigration restrictions while capital controls have sometimes impeded international movements of capital. However, international mobility of factors can and does take place to varying degrees. Workers legally migrate across borders, as occurs in the European Union which allows the free movement of labor among its member countries. And sometimes, workers migrate in violation of immigration laws, as seen with Mexican workers illegally moving to the United States. Moreover, capital flows readily across national borders in today's markets.

Simply put, there are different degrees of factor mobility because there are different costs associated with moving factors across firms and industries. Some factors such as accountants are relatively mobile because their skills are used by all businesses. Yet other factors like looms used to weave cloth tend to be immobile because they are not generally useful or productive in another industry.

U.S. steel companies provide an example of **exit barriers** that limit their ability to leave an unprofitable market. Thus, exit barriers reduce the mobility of factors of production. Typical barriers to exit include highly specialized equipment, which may be difficult to sell or relocate, as well as the high costs involving asset write-offs and plant closure.

For example, if a steel company would leave an unprofitable market, it would face high costs involving continuing employee benefits such as health and life insurance, pensions, and severance pay, and unemployment benefits when a plant is shut down. Costs would also include penalties for terminating contracts to raw-material suppliers and expenses associated with the writing off of undepreciated plant assets. Other costs would include environmental cleanup at abandoned steel facilities that can easily amount to hundreds of millions of dollars. Furthermore, steel companies generally do not realize much income by selling many of their plants' assets. The equipment is unique to the steel industry and is of little value for any purpose other than producing steel. What's more, the equipment in a closed plant is often in need of major renovation because the former owner allowed the plant to become antiquated prior to closing.

Therefore, exit barriers imply a high cost of leaving an unprofitable market or discontinuing a low-profit product. They may sometimes be high enough to force continued operation in a market because the price of leaving is higher than staying. We will learn more about the immobility of factors of production in Chapter 3 of this text, when we consider the Specific Factors theory of trade.

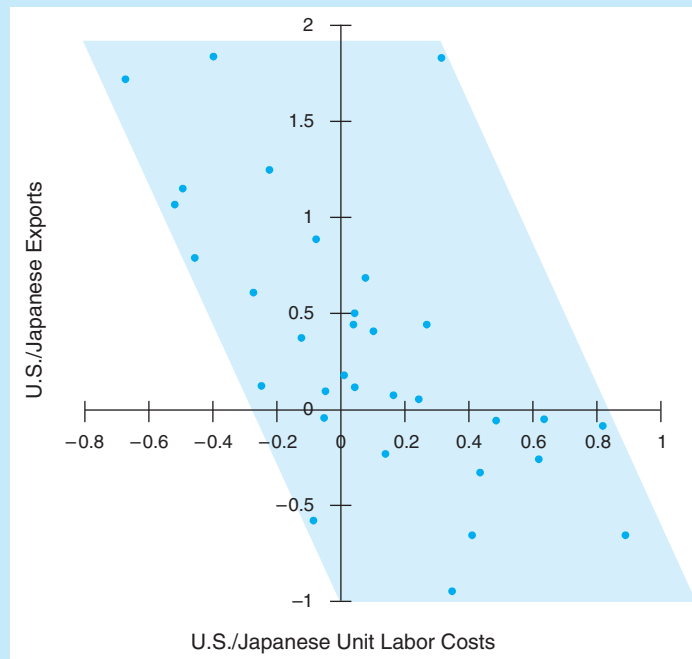
Empirical Evidence on Comparative Advantage

We have learned that Ricardo's theory of comparative advantage implies that each country will export goods for which its labor is relatively productive compared with that of its trading partners. Does his theory accurately predict trade patterns? A number of economists have put Ricardo's theory to empirical tests.

The first test of the Ricardian model was made by the British economist G.D.A. MacDougall in 1951. Comparing the export patterns of 25 separate industries for the United States and the United Kingdom for the year 1937, MacDougall tested the Ricardian prediction that nations tend to export goods in which their labor productivity is relatively high. Of the 25 industries studied, 20 fit the predicted pattern. The MacDougall investigation thus supported the Ricardian theory of comparative advantage. Using different sets of data, subsequent studies by Balassa and Stern also supported Ricardo's conclusions.¹⁰

A more recent test of the Ricardian model comes from Stephen Golub who examined the relation between relative unit labor costs (the ratio of wages to productivity) and trade for the United States vis-à-vis the United Kingdom, Japan, Germany, Canada, and Australia. He found that relative unit labor cost helps to explain trade patterns for these nations. The U.S. and Japanese results lend particularly strong support for the Ricardian model, as shown in Figure 2.9. The figure displays a scatter plot U.S./Japan trade data showing a clear negative correlation between relative exports and relative unit labor costs for the 33 industries investigated. Although there is empirical support for the Ricardian model, it is not without limitations. Labor is not the only input factor. Allowance should be made where appropriate for production and distribution costs other than direct labor. Differences in product quality also explain trade patterns in industries such as automobiles and footwear. We should therefore proceed with caution in explaining a nation's competitiveness solely on the basis of labor productivity and wage levels. Chapter 3 will discuss this topic in more detail.

¹⁰G.D.A. MacDougall, "British and American Exports: A Study Suggested by the Theory of Comparative Costs," *Economic Journal* 61 (1951). See also B. Balassa, "An Empirical Demonstration of Classical Comparative Cost Theory," *Review of Economics and Statistics*, August 1963, pp. 231–238 and R. Stern, "British and American Productivity and Comparative Costs in International Trade," *Oxford Economic Papers*, October 1962.

FIGURE 2.9**Relative Exports and Relative Unit Labor Costs: U.S./Japan, 1990**

The figure displays a scatter plot of U.S./Japan export data for 33 industries. It shows a clear negative correlation between relative exports and relative unit labor costs. A rightward movement along the figure's horizontal axis indicates a rise in U.S. unit labor costs relative to Japanese unit labor costs; this correlates with a decline in U.S. exports relative to Japanese exports, a downward movement along the figure's vertical axis.

Source: Stephen Golub, *Comparative and Absolute Advantage in the Asia-Pacific Region*, Center for Pacific Basin Monetary and Economic Studies, Economic Research Department, Federal Reserve Bank of San Francisco, October 1995, p. 46.

Can American Workers Compete with Low-Wage Workers Abroad?

As a member of the U.S. Senate, Bernie Sanders has voted against every trade agreement that has been placed before Congress since he was elected to it in the 1990s. Sanders and his constituents believe that highly paid American workers cannot compete with workers in poor countries who earn much lower wages. Sanders notes that Malaysia and Vietnam have minimum wages that are the equivalent of about 60 cents an hour. He maintains that American workers should not have to compete against people forced to work under these conditions: This is not free trade but rather a race to the bottom, argues Sanders. Therefore, he has been unwilling to support free trade between the United States and developing countries.

However, critics of Sanders maintain that his position on trade is inappropriate. Taken to the extreme, should the United States only trade with countries whose wage rates are equal to, or higher than ours? Obviously not say the critics, because this would rule out many poor countries from following the path of Japan, China, and South Korea, who have used trade as a means of lifting many of their people out of poverty.

Also, Sanders' critics feel that his view of trade reflects a misunderstanding of basic economics. The reason American wages are much higher than those in poor countries is not that American workers are inherently superior. Instead, it is because they are more productive as the result of advantages bestowed by U.S. economic institutions and endowments. American workers tend to have higher skills, have access to superior technologies, are better educated, work with more plants and equipment, and operate in a system with better institutions and social capital. Therefore, firms that are located in the United States can, on average, afford to pay their workers higher wages and still remain cost competitive. However, average wages are low in poor countries because of poor skills, inferior technologies, inadequate plants and equipment, and often weak institutions. Given these disadvantages, only by paying low wages are firms in poor countries able to compete.

Robert Lawrence, an economist at Harvard University, has found a strong relationship between average productivity (GDP per capita) and average wages. While the match between these two variables is not perfect, the correlation between them is high, according to Lawrence. Table 2.7 provides examples of this relationship for the year 2013. For example, Mexican manufacturing wages were about a fifth of those in the United States, while the relationship between American and Mexican labor productivity was about the same.

TABLE 2.7

Examples of International Comparisons of Average Hourly Compensation in Manufacturing and Average Productivity of Labor, 2013*

	HOURLY COMPENSATION OF LABOR		AVERAGE PRODUCTIVITY OF LABOR	
	In U.S. Dollars	As a % of Labor Costs in the U.S.	GDP per Capita in U.S. Dollars	As a % of U.S. GDP per capita
United States	\$36.34	100%	\$52,980	100%
Japan	29.13	80	38,634	73
New Zealand	25.85	71	42,308	80
South Korea	21.96	60	25,998	49
Argentina	19.97	55	14,443	27
Portugal	12.90	35	21,619	41
Czech Republic	12.17	33	19,814	37
Brazil	10.69	29	12,072	23
Poland	9.25	25	13,777	26
Mexico	6.82	19	10,173	19
Philippines	2.12	6	2,787	5

*Data for China was not available for this table.

Sources: Data taken from Conference Board, *International Comparisons of Hourly Compensation Costs in Manufacturing, Summary Tables* at <https://www.conference-board.org/> and World Bank, *GDP Per Capita (Current US\$)*, at <http://data.worldbank.org/>.

Lawrence's findings are consistent with David Ricardo's principle of comparative advantage. Indeed, there will be some industries in which the U.S. advantages in technology and productivity are more than necessary to offset America's higher wages; in these industries, the comparative advantages rest with the United States and American firms will be able to compete. Yet in some industries, U.S. advantages in technology and productivity are not able to offset high American wages, and in these industries the United States has a comparative disadvantage and will find it difficult to compete. Therefore, Lawrence's findings suggest that those who oppose free trade are shortchanging the competitiveness of U.S. workers

when they claim Americans cannot compete internationally with firms based in countries that pay lower wages. There are many American industries in which they can, and they do.¹¹

The Case for Free Trade

For more than two centuries, most economists have steadfastly promoted free trade among nations as the best trade policy. Free trade is a market situation in which trade in goods and services between or within countries flows uninhibited by government-imposed restrictions such as tariffs and quotas. The case for free trade was pioneered by Adam Smith in the late 1700s and further developed by David Ricardo in the early 1800s.

According to Ricardo, the case for free trade is based on a powerful argument: Through free trade based on the principle of comparative advantage, the world economy can achieve a more efficient allocation of resources and a higher standard of living than it can without free trade. In other words, for the world as a whole, free trade results in a higher level of output and income than no trade; it also allows each nation to obtain a higher level of production and consumption than can be achieved in isolation.

Also, there are other benefits from free trade than those emphasized in the standard analysis of Ricardo. Here are some of the benefits:

- *Increased competition deters monopoly.* A company shielded from foreign competitors is more likely to have monopoly power, which in turn provides it the ability to increase prices above competitive levels. Opening up trade promotes competition that decreases the ability of a firm to attain high prices.
- *More innovation.* The transfer of technological advances around the world is often thought to be linked to the trading of the goods that embody those advances. An example is Toyota's manufacturing system of automobiles that reduces inefficiencies and speeds up the production process. This system has been adopted by many other auto companies throughout the world.
- *Wider range of product choices.* Goods produced in different countries are not exactly the same. French wine, for example, is not identical to American wine. Free trade provides consumers in all countries increased variety from which to choose.
- *Harmony of national interests.* Free trade tends to link the interests of countries by reducing national animosities. Facing political disagreements, trading partners tend to negotiate rather than engage in war.

While a nation as a whole can benefit from free trade, trade may harm particular domestic industries and their workers. Those industries might attempt to maintain their economic positions by convincing their governments to protect them from imports, perhaps through tariffs or other trade barriers. This topic will be discussed in Chapters 4 and 5 of this book.

Comparative Advantage and Global Supply Chains

For decades, most economists have insisted that countries generally gain from free trade. Their optimism is founded on the theory of comparative advantage developed by David Ricardo. The theory states that if each country produces what it does best and allows trade,

¹¹Robert Lawrence, *Misconceptions on the Campaign Trail: American Workers Can't Compete with Low-Wage Workers Abroad*, Peterson Institute for International Economics, Washington DC, April 21, 2016; Robert Lawrence, *The Growing Gap Between Real Wages and Labor Productivity*, Peterson Institute for International Economics, Washington DC, July 21, 2015; Paul Krugman and Robert Lawrence, "Trade, Jobs and Wages," *Scientific American*, October 13, 2008.

all will realize lower prices and higher levels of output, income, and consumption than could be achieved in isolation. When Ricardo formulated his theory, major factors of production could not move to other nations. Yet in today's world, important resources—labor, technology, capital, and ideas—often shift around the globe.

From electronics and automobiles to clothing or software development, many goods today are provided by global supply chains. Rather than carrying out everything from research and development to delivery and retail sales within a particular country, many industries have separated this process into stages or tasks that are undertaken in many countries. The international production networks that allow firms to move goods and services efficiently across national borders are known as **global supply chains**.

Global supply chains employ the practice of **outsourcing** (off shoring), which refers to the subcontracting of work to another firm or the purchase of components for a product rather than manufacturing them in order to save on production costs. The location of production near customers is another motivation of outsourcing.

Over time, several factors have contributed to the development of global supply chains—technological changes that allow production processes to be fragmented, falling trade barriers, lower transportation costs, improved telecommunications, more secure intellectual property rights, and improved contract enforcement. As countries have become more integrated into these chains, they become more specialized in specific tasks based on comparative advantage.

Concerning comparative advantage, global supply chains foster new patterns of trade, as firms in a country specialize in a particular stage or task. In electronics, for example, intermediate goods are often produced in South Korea, Japan, Taiwan, and Hong Kong, while final assembly activities are contracted to Chinese companies. Apple's iPhone, iPod, and iPad are familiar examples of goods produced via a global supply chain.¹²

The ability to separate the production process into tasks that can be done in different locations has implications for the pattern of world trade. First, it means a change in the nature of specialization. Traditionally, a country's exports were concentrated in final goods or services in which it had a comparative advantage. However, with global supply chains, specialization is more narrowly defined, with countries specializing in tasks or stages within products, based on comparative advantage. Also, the nature of trade flows are affected by global supply chains. As supply chains expand, trade between industrial and developing countries tends to increase, because the location of tasks depends on differences in comparative advantage. Moreover, the pattern of trade becomes more dominated by trade in intermediate goods and services—such as parts, components, and computer services—as supply chains expand.

The semiconductor industry provides an example of these effects. In the past, the United States would have exported finished semiconductors to China. Now, the United States performs research and development and also the design and front-end fabrication of a semiconductor. It then exports the semi-finished semiconductor to a Southeast Asian country, such as Malaysia, that performs the back-end testing, assembly, and packaging of that semiconductor. Malaysia then exports the packaged semiconductor to China where it is incorporated into various electronic products, such as television sets, and then exported to

¹²U.S. International Trade Commission, "Global Supply Chains." In *The Economic Effects of Significant U.S. Import Restraints*, August 2011; Judith Dean and Mary Lovely, "Trade Growth, Production Fragmentation and China's Environment." In *China's Growing Role in World Trade*, edited by R. Feenstra and S. Wei, National Bureau of Economic Research and University of Chicago Press, 2010; Premachandra Athukorala and Nobuaki Yamashita, "Production Fragmentation and Trade Integration: East Asia in a Global Context," *North American Journal of Economics and Finance*, Vol. 17, 2006.

consumers throughout the world. Therefore, global supply chains enhance a country's gains from trade because they allow a good to be produced more efficiently than if the entire process had to take place in a single location.

Global supply chains may also provide gains for developing countries because of opportunities to participate in one or more stages in the production of technology, or skill-intensive goods, rather than having to attain mastery over the total production process. Firms initially performing the least-skilled tasks may learn through interaction with more advanced firms in the chain and thus can move to higher-value production activities.

India provides an example of this process. During the 1990s, India's software firms tended to be in the lower to middle end of the software development chain, specializing in contract programming, coding, and testing. By the early 2000s, its firms engaged in business and technology consulting, systems integration, product engineering, and other more skill-intensive activities as the firms learned through interaction with more skilled firms.

Although global supply chains yield economic efficiencies, they can be subject to global shocks. For example, if a country undergoes an economic downturn, or experiences internal conflict or natural disasters, other countries in the supply chain can be adversely affected. During the Great Recession of 2007–2009, the U.S. demand for Chinese electronics declined, thus causing a decrease in the Chinese demand for electronics parts and components from other Asian suppliers. Another example is the 2011 earthquake and tsunami that hit Japan and disrupted supply chains of Toyota and Honda who manufactured autos at factories in the United States.

Advantages and Disadvantages of Outsourcing

Proponents of outsourcing maintain that it can create a win-win situation for the global economy. Obviously, outsourcing benefits a recipient country such as India. For example, some of India's people work for a subsidiary of Southwest Airlines of the United States and make telephone reservations for Southwest's travelers. Moreover, incomes increase for Indian vendors supplying goods and services to the subsidiary, and the Indian government receives additional tax revenue. The United States also benefits from outsourcing in several ways:

- *Reduced costs and increased competitiveness for Southwest, which hires low-wage workers in India to make airline reservations.* In the United States, many offshore jobs are viewed as relatively undesirable or of low prestige; whereas in India, they are often considered attractive. Thus, Indian workers may have higher motivation and out-produce their U.S. counterparts. The higher productivity of Indian workers leads to falling unit costs for Southwest.
- *New exports.* As business expands, Southwest's Indian subsidiary may purchase additional goods from the United States, such as computers and telecommunications equipment. These purchases result in increased earnings for U.S. companies such as AT&T and additional jobs for American workers.
- *Repatriated earnings.* Southwest's Indian subsidiary returns its earnings to the parent company; these earnings are plowed back into the U.S. economy. Many offshore providers are, in fact, U.S. companies that repatriate earnings.

Simply put, proponents of outsourcing contend that if U.S. companies cannot locate work abroad they will become less competitive in the global economy as their competitors reduce costs by outsourcing. This process will weaken the U.S. economy and threaten more American jobs. Proponents also note that job losses tend to be temporary and that the creation of new industries and new products in the United States will result in more lucrative jobs for Americans. As long as the U.S. workforce retains its high level of skills and remains

flexible as companies position themselves to improve their productivity, high-value jobs will not disappear in the United States.

Of course, what is good for the economy as a whole may not be good for a particular individual. The benefits of outsourcing to the United States do not eliminate the burden on Americans who lose their jobs or find lower-wage jobs because of foreign outsourcing. American labor unions often lobby Congress to prevent outsourcing, and several U.S. states have considered legislation to severely restrict their governments from contracting with companies that move jobs to low-wage developing countries.¹³

Outsourcing and the U.S. Automobile Industry

Developments in the U.S. automobile industry over the past century illustrate the underlying forces behind outsourcing. In the early 1900s, it took only 700 parts for workers at Ford Motor Company to produce a Model T. With this relatively small number of parts, Ford blended the gains of large-scale mass production with the gains of a high degree of specialization within a single plant. Workers were highly specialized and usually performed one single task along an automated assembly line, while the plant was vertically integrated and manufactured the vehicle starting from raw materials.

As consumers became wealthier and insisted on more luxurious vehicles, competitors to Ford emerged. Ford was forced to develop a family of models, each fitted with comfortable seats, radios, and numerous devices to improve safety and performance. As cars became more sophisticated, Ford could no longer produce them efficiently within a single plant. As the number of tasks outgrew the number of operations that could be efficiently conducted within a plant, Ford began to outsource production. The firm has attempted to keep strategically important tasks and production in-house while noncore tasks are purchased from external suppliers. As time has passed, increasing numbers of parts and services have come to be considered noncore, and Ford has farmed out production to a growing number of external suppliers, many of which are outside the United States. Today, about 70 percent of a typical Ford vehicle comes from parts, components, and services purchased from external suppliers. Clearly, without the development toward increased specialization and outsourcing, today's cars would be either closer to Model T technology in quality or they would be beyond the budgets of ordinary people. By the 2000s, service industries, such as information technology and bill processing, were undergoing similar developments as the automobile industry had in the past.¹⁴

The iPhone Economy and Global Supply Chains

Apple Inc. is a multinational company that produces consumer electronics, computer software, and commercial servers. Headquartered in Cupertino, CA, the company was founded by Steve Jobs and Steve Wozniak in 1976. Although Apple used to produce its goods in America, today most are produced abroad. Virtually all iPhones, iPads, iMacs, and other Apple products are made in Asia, Europe, and elsewhere. Apple employs 40,000 workers in the United States but has 700,000 workers in China; Apple licenses the production of its devices to Foxconn Technology Group, which is headquartered in Taiwan and is the world's largest maker of consumer electronics products. What would it take to make iPhones in the United States?

¹³Jagdish Bhagwati et al., "The Muddles Over Outsourcing," *Journal of Economic Perspectives*, Fall 2004, pp. 93–114. See also McKinsey Global Institute, *Offshoring: Is It a Win-Win Game?* (Washington, DC: McKinsey Global Institute, 2003).

¹⁴World Trade Organization, *World Trade Report 2005* (Geneva, Switzerland), pp. 268–274.

In its early days, Apple usually did not look outside the United States for manufacturing sites. For example, for several years after Apple began producing the Macintosh in 1983, the company boasted that the Mac was a computer “Made in America.” However, this began to change at the turn of the century when Apple switched to foreign manufacturing. Asia’s attractiveness was partly due to its less expensive, semiskilled workers. That was not the main motivation for Apple because the cost of labor is negligible compared with the expense of purchasing parts and running supply chains that combine components and services from hundreds of companies. Apple maintains that the vast scale of overseas factories as well as the flexibility, perseverance, and skills of foreign workers have become so superior to their American counterparts that manufacturing in the United States is no longer a realistic option for most Apple products.

For example, Apple used a Chinese factory to revamp the production of the iPhone just weeks before it was introduced to the market. Apple had redesigned the iPhone’s screen at the last minute, necessitating an assembly line overhaul. New screens began arriving at the plant around midnight. To implement a speedy changeover, the plant foreman woke up the workers sleeping in the company’s crowded dormitories and the overhaul began. Within four days, the plant overhaul was complete and began producing 10,000 iPhones a day with a new, unscratchable glass screen. Workers at this plant toil up to 12 hours a day, six days a week. Apple’s executives noted that the plant’s speed and flexibility are superb and there is no American plant that can rival it. However, critics maintain that in China, human costs are built into the iPhone and other Apple products. They note that Apple’s desire to increase product quality and decrease production costs has resulted in the firm and its suppliers often ignoring safety conditions for workers, disposal of hazardous waste, employment of underage workers, excessive overtime, and the like. Bleak working conditions have also been documented at Chinese factories manufacturing products for Hewlett-Packard, Dell, IBM, Sony, and others.

Yet some aspects of the iPhone are American. The product’s software, for example, and its innovative marketing characteristics were mostly developed in the United States. Also, Apple has built a data center in North Carolina, and key semiconductors inside the iPhone are made in an Austin, Texas factory by Samsung, of South Korea. However, those facilities do not provide many jobs for Americans. Apple’s North Carolina data center employs only 100 full-time workers, and the Samsung plant employs about 2,400 workers. Simply put, if you expand production from 1 million phones to 25 million phones, you don’t need many additional programmers.

In defending its strategy of production outsourcing, Apple notes that there are not enough American workers with the skills the company needs or U.S. factories with sufficient speed and flexibility. According to Apple, a crucial challenge in setting up plants in the United States is finding a technical work force. In particular, Apple and other technology companies say they need engineers with more than high school training, but not necessarily a bachelor’s degree. Americans at that skill level are hard to find. Simply put, Apple’s outsourcing is not merely motivated by low wages in China.¹⁵

¹⁵Charles Duhigg and Keith Bradsher, “How the U.S. Lost Out on iPhone Work,” *The New York Times*, January 21, 2012; “In China, Human Costs Are Built into an iPad,” *The New York Times*, January 25, 2012 at <http://www.nytimes.com>; Rich Karlgaard, “In Defense of Apple’s China Plants,” *The Wall Street Journal*, February 2, 2012, p. A-13; Greg Linden, Kenneth Kraemer, and Jason Dedrick, “Innovation and Job Creation in a Global Economy: The Case of Apple’s iPod,” *Journal of International Commerce and Economics*, 2011.

Outsourcing Backfires for Boeing 787 Dreamliner

Although outsourcing may have contributed to greater efficiencies in auto production, it created problems for Boeing in the production of jetliners. In 2007, the first wings for Boeing's new \$150 million jetliner, the 787 Dreamliner, landed in Seattle, Washington, ready-made in Japan. Three Japanese firms were awarded 35 percent of the design and manufacturing work for the 787, with Boeing performing final assembly in only three days. Other nations, such as Italy, China, and Australia, were also involved in supplying sections of the 787. Boeing maintained that by having contractors across the world build large sections of its airplanes, the firm could decrease the time required to build its jets by more than 50 percent and reduce the plane's development cost from \$10 billion to \$6 billion. Simply put, Boeing has manufactured just 35 percent of the plane before assembling the final aircraft at its plant outside Seattle; 65 percent of the plane's manufacturing comes from abroad.

To decrease costs, Boeing required foreign suppliers to absorb some of the costs of developing the plane. In return for receiving contracts to make sections of the 787, foreign suppliers invested billions of dollars, drawing from whatever subsidies were available. For example, Japan's government provided loans of up to \$2 billion to the three Japanese suppliers of Boeing, and Italy provided regional infrastructure for its supplier company. This spreading of risk allowed Boeing to decrease its developmental costs and thus be a more effective competitor against Airbus.

The need to find engineering talent and technical capacity was another motive behind Boeing's globalization strategy. According to Boeing executives, the complexity of designing and producing the 787 requires that people's talents and capabilities are brought together from all over the world. Also, sharing work with foreigners helps Boeing maintain close relationships with its customers. For example, Japan has spent more money buying Boeing jetliners than any other country: Boeing shares its work with the Japanese, and the firm in turn secures a virtual monopoly in jetliner sales to Japan.

But the strategy backfired when Boeing's suppliers fell behind in getting their jobs done, which resulted in the 787's production being more than four years behind schedule. The suppliers' problems ranged from language barriers to snarls that erupted when some contractors themselves outsourced chunks of work. Boeing was forced to turn to its own union workforce to piece together the first few airplanes after their sections arrived at the firm's factory in Seattle, with thousands of missing parts. That action resulted in anger and anxiety among union workers who maintained that if Boeing had let them build the 787 in the first place, they would have achieved the production goal. Boeing workers also feared that the firm would eventually attempt to allow foreign contractors to go one step further and install their components directly in the 787. Although Boeing officials insisted that they had no intentions to do this, they refused to give union workers assurances in writing.

By giving up control of its supply chain, Boeing had lost the ability to oversee each step of production. Problems often were not discovered until parts came together at Boeing's Seattle plant. Fixes were not easy, and cultures among suppliers often clashed. Boeing officials lamented that it seemed like the Italians only worked three days a week (they were always on vacation) while the Japanese worked six days a week. Also, there were apprehensions among Boeing workers that they were giving up their trade secrets to the Japanese and Chinese and that they would soon be their competition.

Outsourcing was intended to save money, but in Boeing's case, it backfired. The 787 came in at several billion dollars over budget and over three years behind schedule before it made first flight in late 2011. The plane's lithium-ion batteries overheated, which caused additional downtime to correct. Boeing officials admitted that they outsourced work to people who were not up to the task, with the result being poorly made components, problems with electrical systems and environmental controls, and missed deadlines that

disrupted the production schedule for the entire plane. Simply put, Boeing spent a lot more money in trying to recover than it would have spent if it kept many of the key technologies closer to Boeing.¹⁶

Reshoring Production to the United States

For several decades, many American firms with high labor costs found that they could realize huge savings by sending work to countries where wages were much lower. However, by 2013, producers were increasingly rethinking their offshoring strategies. Prominent firms such as Caterpillar, Ford Motor Company, Google, Apple, and General Electric were bringing some of their production back to the United States. Why? The most important reason was that wages in China and India were increasing by 10–20 percent a year while manufacturing pay in the United States and Europe remained sluggish. Therefore, the wage gap was narrowing. True, other countries such as Vietnam and Bangladesh are competing to replace China as low-wage havens. However, they lack China's scale, efficiency, and supply chains.

INTERNATIONAL TRADE APPLICATION

Deindustrialization Redeploys Workers to Growing Service Sector

Economists at the Federal Reserve Bank of Dallas have examined the effects of changing competitiveness and deindustrialization on the labor market. They conclude that the decline of industrial employment in advanced economies is part of a long-run structural transition. A growing service sector, with an increasing share of jobs, has become key to competitiveness and long-run productivity growth. This essay summarizes their argument.

Employment in America's industrial sector—which includes manufacturing, mining, and construction—increased by approximately 240,000 jobs annually from 1900 to 1980. By 1980, industrial employment peaked, and it has declined ever since. This decrease has fostered debate about American companies outsourcing their operations abroad and protectionist barriers applied to trade.

The U.S. economy has undergone a structural transformation throughout its history. From the 1800s to the early 2000s, America has realized a decreasing share of agricultural employment, a rise and subsequent decrease of industrial employment, and most recently, an increase in employment in the service sector, such as banking, finance, and insurance. In fact, all advanced economies have experienced a similar evolution. The decline in



industrial employment reflects productivity gains arising from discovery and innovation and an expanding service sector. In particular, globalization and international trade have permitted the United States to produce and export high-value-added manufacturing and services while importing low-tech goods from emerging countries.

However, a declining manufacturing sector harms some workers who lack the skills to find work with firms producing sophisticated manufactured goods and services. As a result, there has been resistance in the United States to globalization and the outsourcing of manufacturing. American manufacturing has difficulty competing with the low labor costs of unskilled workers in emerging economies. Rather, the comparative advantage of the United States is in producing high-technology, high-value-added goods and services.

Policies that are intended to protect the American manufacturing sector, such as export subsidies, import tariffs, and limits on offshoring, ultimately impede the process of structural transformation and can hinder long-run economic growth. Instead policymakers should recognize the significance of an expanding service sector and consider focusing resources on assisting displaced manufacturing workers and providing incentives for them to acquire skills to engage in higher value-added activities.

(continued)

¹⁶Steve Denning, "What Went Wrong at Boeing?," *Forbes*, January 21, 2013.

What do you think? Regarding deindustrialization and employment, what do you think about the views of economists at the Federal Reserve Bank of Dallas?

Sources: Michael Sposi and Valerie Brossman, “Deindustrialization Redeploys Workers to Growing Service Sector,” *Economic Letter*, Federal Reserve Bank of Dallas, Vol. 9, No. 11, September 2014. See also Berthold Herrendorf, Richard Rogerson, and Akos Valentinyi, “Growth and Structural Transformation,” National Bureau of Economic Research, Working Paper No. 18996, April 2013.

America’s companies were also realizing the downside of distance. The cost of shipping goods around the world by ocean freight was increasing sharply, and goods often spent weeks in transit. Rising shipping, rail, and road costs are especially harmful for companies that produce goods with relatively low value, such as consumer goods and appliances. Also, locating production far away from customers in large, new markets makes it difficult to customize products and respond quickly to changing local demand. Companies are increasingly factoring in the risk that natural disasters or geopolitical shocks could disrupt supply chains. Other factors cited for a resurgence of American manufacturing in recent years are newly cheap energy and increased investment in research and development.

Therefore, Emerson, an electrical equipment maker, has moved factories from Asia to the United States to be closer to its customers. Lenovo, a Chinese technology company, is making personal computers in North Carolina in order to customize them for American customers. IKEA, a Swedish firm that makes furniture and other products for the home, has opened a factory in the United States in order to reduce delivery costs. Desa, a power tools firm, has returned production from China to the United States because savings on transport and raw materials offset higher labor costs.

Also, consider the following example of reshoring. In 2014, Whirlpool Corp. moved part of its washing machine production from its plant in Monterrey, Mexico, to a plant in Clyde, Ohio; the company’s largest washing machine factory. Although wages for production workers in Clyde averaged \$18 to \$19 an hour, about five times higher than in Monterrey, the firm maintained that the shift would decrease costs overall. Why? The Clyde plant is more automated, and electricity costs are much lower than in Monterrey. Also, Whirlpool could save on transportation because the washing machines would not have to be shipped across a border before going into the company’s American distribution network. Whirlpool also announced that it would increase production of washing machines for Mexico’s market at the Monterrey plant and would not need to reduce its Mexican workforce. Similar to other companies, Whirlpool is trying to produce goods closer to where it sells them, thus decreasing the time required to respond to changes in demand.

However, the magnitude of the reshoring movement should not be overstated. Most of the companies involved have been bringing back only some of their production destined for the American market. Much of the production that they offshored during the past few decades remains overseas. Simply put, the United States has continued to grow more reliant on imports from China and other Asian countries despite the recent trend toward reshoring of manufacturing.¹⁷

¹⁷A. T. Kearney Co. *The Truth about Reshoring: Not What It’s Cracked Up to Be* (Chicago: A. T. Kearney Co., 2014); “Here, There and Everywhere: Outsourcing and Offshoring,” *The Economist*, January 19, 2013.

SUMMARY

1. To the mercantilists, stocks of precious metals represented the wealth of a nation. The mercantilists contended that the government should adopt trade controls to limit imports and promote exports. One nation could gain from trade only at the expense of its trading partners because the stock of world wealth was fixed at a given moment in time and because not all nations could simultaneously have a favorable trade balance.
2. Smith challenged the mercantilist views on trade by arguing that, with free trade, international specialization of factor inputs could increase world output, which could be shared by trading nations. All nations could simultaneously enjoy gains from trade. Smith maintained that each nation would find it advantageous to specialize in the production of those goods in which it had an absolute advantage.
3. Ricardo argued that mutually gainful trade is possible even if one nation has an absolute disadvantage in the production of both commodities compared with the other nation. The less productive nation should specialize in the production and export of the commodity in which it has a comparative advantage.
4. Comparative costs can be illustrated with the production possibilities frontier. This frontier indicates the maximum amount of any two products an economy can produce, assuming that all resources are used in their most efficient manner. The slope of the production possibilities frontier measures the marginal rate of transformation that indicates the amount of one product that must be sacrificed per unit increase of another product.
5. Under constant-cost conditions, the production possibilities frontier is a straight line. Domestic relative prices are determined exclusively by a nation's supply conditions. Complete specialization of a country in the production of a single commodity may occur in the case of constant costs.
6. Because Ricardian trade theory relied solely on supply analysis, it was not able to determine actual terms of trade. This limitation was addressed by Mill in his theory of reciprocal demand. This theory asserts that within the limits to the terms of trade, the actual terms of trade are determined by the intensity of each country's demand for the other country's product.
7. The comparative advantage accruing to manufacturers of a particular product in a particular country can vanish over time when productivity growth falls behind that of foreign competitors. Lost comparative advantages in foreign markets reduce the sales and profits of domestic companies as well as the jobs and wages of domestic workers.
8. In the real world, nations tend to experience increasing-cost conditions. Thus, production possibilities frontiers are drawn bowed outward. Relative product prices in each country are determined by both supply and demand factors. Complete specialization in production is improbable in the case of increasing costs.
9. According to the comparative advantage principle, competition forces high-cost producers to exit from the industry. In practice, the restructuring of an industry can take a long time because high-cost producers often cling to capacity by nursing along antiquated plants. Exit barriers refer to various cost conditions that make lengthy exit a rational response for high-cost producers.
10. The first empirical test of Ricardo's theory of comparative advantage was made by MacDougall. Comparing the export patterns of the United States and the United Kingdom, MacDougall found that wage rates and labor productivity were important determinants of international trade patterns. A more recent test of the Ricardian model, conducted by Golub, also supports Ricardo.

KEY CONCEPTS AND TERMS

Autarky (p. 35)

Basis for trade (p. 27)

Commodity terms of trade (p. 41)

Complete specialization (p. 39)

Constant opportunity costs
(p. 35)

Consumption gains (p. 38)

Digital trade (p. 42)

Dynamic gains from international
trade (p. 42)

Exit barriers (p. 54)

Factor mobility (p. 54)

Free trade (p. 28)	Mercantilists (p. 27)	Production gains (p. 35)
Gains from international trade (p. 27)	No-trade boundary (p. 39)	Production possibilities frontier (p. 33)
Global supply chains (p. 59)	Outer limits for the equilibrium terms of trade (p. 39)	Region of mutually beneficial trade (p. 39)
Importance of being unimportant (p. 41)	Outsourcing (p. 59)	Terms of trade (p. 27)
Increasing opportunity costs (p. 46)	Partial specialization (p. 49)	Theory of reciprocal demand (p. 40)
Labor theory of value (p. 29)	Price-specie-flow doctrine (p. 28)	Trade triangle (p. 38)
Marginal rate of transformation (MRT) (p. 34)	Principle of absolute advantage (p. 29)	Trading possibilities line (p. 38)
	Principle of comparative advantage (p. 31)	

STUDY QUESTIONS

- Identify the basic questions with which modern trade theory is concerned.
- How did Smith's views on international trade differ from those of the mercantilists?
- Develop an arithmetic example that illustrates how a nation could have an absolute disadvantage in the production of two goods and still have a comparative advantage in the production of one of them.
- Both Smith and Ricardo contended that the pattern of world trade is determined solely by supply conditions. Explain.
- How does the comparative-cost concept relate to a nation's production possibilities frontier? Illustrate how differently shaped production possibilities frontiers give rise to different opportunity costs.
- What is meant by constant opportunity costs and increasing opportunity costs? Under what conditions will a country experience constant or increasing costs?
- Why is it that the pre-trade production points have a bearing on comparative costs under increasing-cost conditions but not under constant-cost conditions?
- What factors underlie whether specialization in production will be partial or complete on an international basis?
- The gains from specialization and trade are discussed in terms of *production gains* and *consumption gains*. What do these terms mean?
- What is meant by the term *trade triangle*?
- With a given level of world resources, international trade may bring about an increase in total world output. Explain.
- The maximum amount of steel or aluminum that Canada and France can produce if they use all the factors of production at their disposal with the best technology available to them is shown (hypothetically) in Table 2.8.

Table 2.8

Steel and Auto Production

	Canada	France
Steel (tons)	500	1,200
Aluminum (tons)	1,500	800

Assume that production occurs under constant-cost conditions. On graph paper, draw the production possibilities frontiers for Canada and France; locate aluminum on the horizontal axis and steel on the vertical axis of each country's graph. In the absence of trade, assume that Canada produces and consumes 600 tons of aluminum and 300 tons of steel and that France produces and consumes 400 tons of aluminum and 600 tons of steel. Denote these autarky points on each nation's production possibilities frontier.

- Determine the MRT of steel into aluminum for each nation. According to the principle of comparative advantage, should the two nations specialize? If so, which product should each country produce? Will the extent of specialization be complete or partial? Denote each nation's specialization point on its production possibilities frontier. Compared to the output of steel and aluminum that occurs in the

- absence of trade, does specialization yield increases in output? If so, by how much?
- Within what limits will the terms of trade lie if specialization and trade occur? Suppose Canada and France agree to a terms of trade ratio of 1:1 (1 ton of steel = 1 ton of aluminum). Draw the terms of trade line in the diagram of each nation. Assuming 500 tons of steel are traded for 500 tons of aluminum, are Canadian consumers better off as the result of trade? If so, by how much? How about French consumers?
 - Describe the trade triangles for Canada and France.
13. The hypothetical figures in Table 2.9 give five alternate combinations of steel and autos that Japan and South Korea can produce if they fully use all factors of production at their disposal with the best technology available to them. On graph paper, sketch the production possibilities frontiers of Japan and South Korea. Locate steel on the vertical axis and autos on the horizontal axis of each nation's graph.

Table 2.9**Steel and Aluminum Production**

JAPAN		SOUTH KOREA	
Steel (tons)	Autos	Steel (tons)	Autos
520	0	1,200	0
500	600	900	400
350	1,100	600	650
200	1,300	200	800
0	1,430	0	810

- The production possibilities frontiers of the two countries appear bowed out, from the origin. Why?
 - In autarky, Japan's production and consumption points along its production possibilities frontier are assumed to be 500 tons of steel and 600 autos. Draw a line tangent to Japan's autarky point, and from it, calculate Japan's MRT of steel into autos. In autarky, South Korea's production and consumption points along its production possibilities frontier are assumed to be 200 tons of steel and 800 autos. Draw a line tangent to South Korea's autarky point, and from it, calculate South Korea's MRT of steel into autos.
- Based on the MRT of each nation, should the two nations specialize according to the principle of comparative advantage? If so, in which product should each nation specialize?
 - The process of specialization in the production of steel and autos continues in Japan and South Korea until their relative product prices, or MRTs, become equal. With specialization, suppose the MRTs of the two nations converge at $MRT = 1$. Starting at Japan's autarky point, slide along its production possibilities frontier until the slope of the tangent line equals 1. This becomes Japan's production point under partial specialization. How many tons of steel and how many autos will Japan produce at this point? In like manner, determine South Korea's production point under partial specialization. How many tons of steel and how many autos will South Korea produce? For the two countries, do their combined production of steel and autos with partial specialization exceed their output in the absence of specialization? If so, by how much?
 - With the relative product prices in each nation now in equilibrium at 1 ton of steel equal to 1 auto ($MRT = 1$), suppose 500 autos are exchanged at these terms of trade.
 - Determine the point along the terms of trade line at which Japan will locate after trade occurs. What are Japan's consumption gains from trade?
 - Determine the point along the terms of trade line at which South Korea will locate after trade occurs. What are South Korea's consumption gains from trade?
14. Table 2.10 gives hypothetical export price indexes and import price indexes (2000 = 100) for Japan, Canada, and Ireland. Compute the commodity terms of trade for each country for the period 2000–2016. Which country's terms of trade improved, worsened, or showed no change?

Table 2.10**Export Price and Import Price Indexes**

Country	EXPORT PRICE INDEX		IMPORT PRICE INDEX	
	2000	2016	2000	2016
Japan	100	150	100	140
Canada	100	175	100	175
Ireland	100	167	100	190

15. Why is it that the gains from trade could not be determined precisely under the Ricardian trade model?
16. What is meant by the theory of reciprocal demand? How does it provide a meaningful explanation of the international terms of trade?
17. How does the commodity terms of trade concept attempt to measure the direction of trade gains?

EXPLORING FURTHER

For a presentation of *Comparative Advantage in Money Terms*, go to *Exploring Further 2.1*, which can be found in **MindTap**.

For a presentation of indifference curves that shows the role of each country's tastes and preferences in determining the autarky points and how gains from trade are distributed, go to *Exploring Further 2.2*, which can be found in **MindTap**.

For a presentation of offer curves and the equilibrium terms of trade, go to *Exploring Further 2.3*, which can be found in **MindTap**.

Sources of Comparative Advantage



In Chapter 2, we learned how the principle of comparative advantage applies to the trade patterns of countries. The United States, for example, has a comparative advantage in, and exports considerable amounts of, chemicals, semiconductors, computers, generating equipment, jet aircraft, agricultural products, and the like. It has comparative disadvantages in, and depends on other countries for, cocoa, coffee, tea, raw silk, spices, tin, and natural rubber. Imported products also compete with U.S. products in many domestic markets: Japanese automobiles and televisions, Swiss cheese, and Austrian snow skis are some examples. Even the American pastime of baseball relies greatly on imported baseballs and gloves.

What determines a country's comparative advantage? There is no single answer to this question. Sometimes comparative advantage is determined by natural resources or climate, abundance of cheap labor, accumulated skills and capital, and government assistance granted to a particular industry. Some sources of comparative advantage are long lasting, such as huge oil deposits in Saudi Arabia; others can evolve over time like worker skills, education, and technology.

In this chapter, we consider the major sources of comparative advantage: differences in technology, resource endowments, and consumer demand, and the existence of government policies, economies of scale in production, and external economies. We will also consider the impact of transportation costs on trade patterns.

Factor Endowments as a Source of Comparative Advantage

When Ricardo formulated the principle of comparative advantage, he did not explain what ultimately determines comparative advantage. He simply took it for granted that relative labor productivity, labor costs, and product prices differed in the two countries before trade. Moreover, Ricardo's assumption of labor as the only factor of production ruled out an

explanation of how trade affects the distribution of income among various factors of production within a nation and why certain groups favor free trade while other groups oppose it. As we will see, trade theory suggests that some people will suffer losses from free trade.

In the 1920s and 1930s, Swedish economists Eli Heckscher and Bertil Ohlin formulated a theory addressing two questions left largely unexplained by Ricardo: What determines comparative advantage, and what effect does international trade have on the earnings of various factors of production in trading nations? Because Heckscher and Ohlin maintained that factor (resource) endowments determine a nation's comparative advantage, their theory became known as the **factor-endowment theory**. It is also known as the **Heckscher–Ohlin theory**.¹ Ohlin was awarded the 1977 Nobel Prize in Economics for his contribution to the theory of international trade.

The Factor-Endowment Theory

The factor-endowment theory asserts that the immediate basis for trade is the difference between pre-trade relative product prices of trading nations. These prices depend on the production possibilities frontiers and tastes and preferences (demand conditions) in the trading countries. Because production possibilities frontiers depend on technology and resource endowments, the ultimate determinants of comparative advantage are technology, resource endowments, and demand. The factor-endowment theory assumes that technology and demand are approximately the same between countries; it emphasizes the role of relative differences in resource endowments as the ultimate determinant of comparative advantage.² Note that it is the resource-endowment ratio, rather than the absolute amount of each resource available, that determines comparative advantage.

According to the factor-endowment theory, a nation will export the product that uses a large amount of the relatively abundant resource, and it will import the product that in production uses the relatively scarce resource. Therefore, the factor-endowment theory predicts that India, with its relative abundance of labor, will export shoes and shirts, while the United States, with its relative abundance of capital, will export machines and chemicals.

What does it mean to be relatively abundant in a resource? Table 3.1 illustrates hypothetical resource endowments in the United States and China that are used in the production of aircraft and textiles. The U.S. **capital/labor ratio** equals 0.5 (100 machines/200 workers = 0.5), which means there is 0.5 machines per worker. In China, the capital/labor ratio is 0.02 (20 machines/1,000 workers = 0.02), which means there is 0.02 machines per worker.

Because the U.S. capital/labor ratio exceeds China's capital/labor ratio, we call the United States the relatively capital abundant country and China the relatively capital scarce country.

¹Eli Heckscher's explanation of the factor-endowment theory is outlined in his article "The Effects of Foreign Trade on the Distribution of Income," *Economisk Tidskrift* 21 (1919), pp. 497–512. Bertil Ohlin's account is summarized in his *Interregional and International Trade* (Cambridge, MA: Harvard University Press, 1933). See also Edward Leamer, *The Heckscher–Ohlin Model in Theory and Practice*, Princeton Studies in International Finance, No. 77, February 1995.

²The factor-endowment theory also assumes that the production of goods is conducted under perfect competition, suggesting that individual firms exert no significant control over product price; that each product is produced under identical production conditions in the two countries; that if a producer increases the use of both resources by a given proportion, output will increase by the same proportion; that resources are free to move within a country, so that the price of each resource is the same in the two industries within each country; that resources are not free to move between countries, so that pre-trade payments to each resource can differ internationally; and that there are no transportation costs or barriers to trade.

TABLE 3.1**Producing Aircraft and Textiles: Factor Endowments in the United States and China**

Resource	United States	China
Capital	100 machines	20 machines
Labor	200 workers	1,000 workers

Conversely, China is called the relatively labor abundant country and the United States the relatively labor scarce country.

How does the relative abundance of a resource determine comparative advantage according to the factor-endowment theory? When a resource is relatively abundant, its relative cost is less than in countries where it is relatively scarce. Therefore, before the two countries trade, their comparative advantages are that capital is relatively cheap in the United States and labor is relatively cheap in China. So, the United States has a lower relative price in aircraft, which use more capital and less labor. China's relative price is lower in textiles, which use more labor and less capital. The effect of resource endowments on comparative advantage can be summarized as follows:

Differences in relative resource endowments → Differences in relative resource prices → Differences in relative product prices → Pattern of comparative advantage

The predictions of the factor-endowment theory can be applied to the data in Table 3.2, which illustrates capital/labor ratios for selected countries in 2011. To permit useful international comparisons, total capital stocks per worker are shown in 2005 U.S. dollar prices to reflect the actual purchasing power of the dollar in each country. We see that the United States had less capital per worker than some other industrial countries, but more capital per worker than the developing countries. According to the factor-endowment theory, we can conclude that the United States has a comparative advantage in capital-intensive products in relation to developing countries, but not with all industrial countries.

TABLE 3.2**Total Capital Stock per Worker of Selected Countries in 2011***

Industrial Country		Developing Country	
Japan	\$297,565	South Korea	\$233,959
United States	292,658	Mexico	85,597
Germany	251,468	Colombia	67,292
Australia	250,949	Brazil	64,082
Canada	198,930	China	57,703
Sweden	190,793	Philippines	34,913
Russia	107,182	Vietnam	24,721

*In 2005 U.S. dollar prices

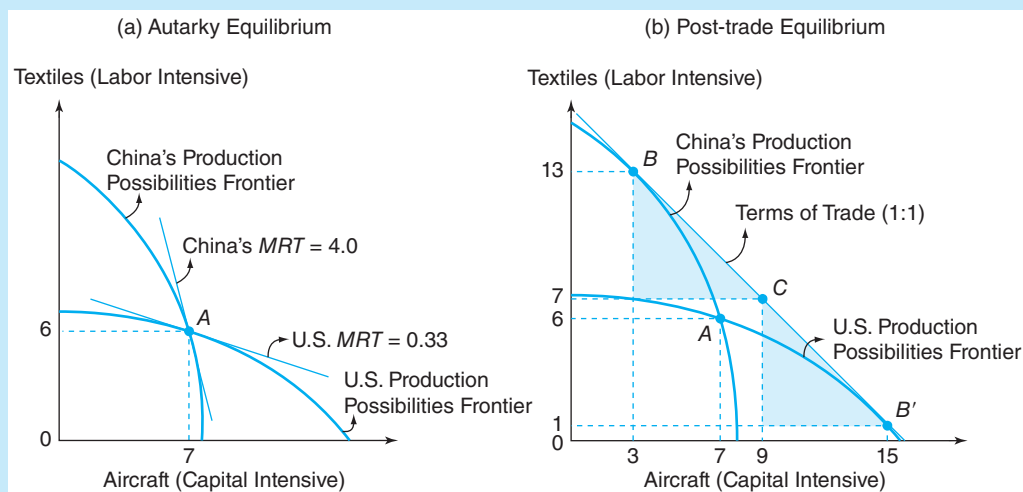
Source: From Robert Feenstra, Robert Inklaar, and Marcel Timmer, University of Groningen, Groningen Growth and Development Centre, *Penn World Table*, Version 8.0, 2013, available at www.rug.nl/research/ggdc/data/penn-world-table.

Visualizing the Factor-Endowment Theory

Figure 3.1 provides a graphical illustration of the factor-endowment theory. It shows the production possibilities frontiers of the United States, assumed to be the relatively capital abundant country, and China, assumed to be the relatively labor abundant country. The figure also assumes that aircraft are relatively capital intensive in their production process and textiles are relatively labor intensive in their production process.

FIGURE 3.1

The Factor-Endowment Theory



A country exports the good whose production is intensive in its relatively abundant factor. It imports the good whose production is intensive in its relatively scarce factor.

Because the United States is the relatively capital abundant country and aircraft are the relatively capital-intensive good, the United States has a greater capability in producing aircraft than China. Thus, the production possibilities frontier of the United States is skewed (biased) toward aircraft, as shown in Figure 3.1. Similarly, because China is the relatively labor abundant country and textiles are a relatively labor-intensive good, China has a greater capability in producing textiles than does the United States. China's production possibilities frontier is skewed toward textiles.

Suppose that in autarky, both countries have the same demand for textiles and aircraft, which results in both countries producing and consuming at point A in Figure 3.1(a).³ At this point, the absolute slope of the line tangent to the U.S. production possibilities frontier is smaller (U.S. MRT = 0.33) than that of the absolute slope of the line tangent to China's production possibilities frontier (China's MRT = 4.0). Thus, the United States has a lower relative price for aircraft than China. This finding means that the United States has a comparative advantage in aircraft while China has a comparative advantage in textiles.

³Note that the factor-endowment theory does not require that tastes and preferences be identical for the United States and China. It only requires that they be approximately the same. This approximation means that community indifference curves have about the same shape and position in all countries, as discussed in *Exploring Further 2.2* in Chapter 2. For simplicity, Figure 3.1 assumes exact equality of tastes and preferences.

Although Figure 3.1(a) helps us visualize the pattern of comparative advantage, it does not identify the ultimate cause of comparative advantage. In our trading example, capital is relatively cheap in the relatively capital abundant country (the United States), and labor is relatively cheap in the relatively labor abundant country (China). It is because of this difference in relative resource prices that the United States has a comparative advantage in the relatively capital-intensive good (aircraft) and China has a comparative advantage in the relatively labor-intensive good (textiles). The factor-endowment theory asserts that the difference in relative resource abundance is the cause of the pre-trade differences in the relative product prices between the two countries.

Most of the analysis of the gains from trade in Chapter 2 applies to the factor-endowment model seen in Figure 3.1(b). With trade, each country continues to specialize in the production of the product of its comparative advantage until its product price equalizes with that of the other country. Specialization continues until the United States reaches point B' and China reaches point B , the points where each country's production possibilities frontier is tangent to the common relative price line that is assumed to have an absolute slope of 1.0. This relative price line becomes the equilibrium terms of trade. Let's assume that with trade both nations prefer a post-trade consumption combination of aircraft and textiles given by point C . To achieve this point, the United States exports six aircraft for six units of textiles and China exports six units of textiles for six aircraft. Because point C is beyond the autarky consumption point A , each country realizes gains from trade.

The factor-endowment model explains well why labor abundant countries such as China would export labor-intensive products such as textiles and toys and capital abundant countries such as the United States would export aircraft and machinery. However, it does not adequately explain two-way trade that widely exists: Many countries export steel and automobiles, but they also import them. Also, the factor-endowment theory does not satisfactorily explain why wealthy countries, such as the United States and Europe, that have similar endowments of labor and capital trade more intensively with those with dissimilar endowments. You will learn about additional trade theories as you read this chapter.

Applying the Factor-Endowment Theory to U.S.–China Trade

The essence of the factor-endowment theory is seen in trade between the United States and China. In the United States, human capital (skills), scientific talent, and engineering talent are relatively abundant, but unskilled labor is relatively scarce. Conversely, China is relatively rich in unskilled labor while scientific and engineering talent are relatively scarce. Thus, the factor-endowment theory predicts that the United States will export to China goods embodying relatively large amounts of skilled labor and technology, such as aircraft, software, pharmaceuticals, and high-tech components of electrical machinery and equipment; China will export to the United States goods for which a relatively large amount of unskilled labor is used, such as apparel, footwear, toys, and the final assembly of electronic machinery and equipment.

Table 3.3 lists the top U.S. merchandise exports to China and the top Chinese merchandise exports to the United States in 2016. The pattern of U.S.–China trade appears to fit quite well to the predictions of the factor-endowment theory. Most of the U.S. exports to China were concentrated in higher-skilled industries such as computers, chemicals, and transportation equipment including aircraft. Conversely, Chinese exports to the United States tended to fall into the lower-skilled industries such as electronics, furniture, sporting equipment, and apparel. These trade data provide only a rough overview of U.S.–China trade patterns and do not prove the validity of the factor-endowment theory.

TABLE 3.3

U.S.–China Merchandise Trade: 2016 (billions of dollars)

U.S. EXPORTS TO CHINA			U.S. IMPORTS FROM CHINA		
Product	Value	Percent	Product	Value	Percent
Transportation equipment	25.5	22.0	Computers and electronics	161.3	34.9
Agricultural products	17.3	14.9	Electrical equipment	40.7	8.8
Computers and electronics	17.1	14.8	Manufactured commodities	39.4	8.5
Chemicals	13.5	11.7	Machinery	30.4	6.6
Machinery	8.3	7.2	Apparel	30.3	6.5
All others	<u>34.1</u>	<u>29.4</u>	All others	<u>160.7</u>	<u>34.7</u>
Total	115.8	100.0	Total	462.8	100.0

Sources: From U.S. Department of Commerce, International Trade Administration, available at <http://www.ita.doc.gov>. Scroll down to Trade Stats Express (<http://tse.export.gov/>) and to *National Trade Data*. See also Foreign Trade Division, U.S. Census Bureau.

Chinese Manufacturers Beset by Rising Wages and a Rising Yuan

For several decades, a vast pool of inexpensive labor fostered China's manufacturing boom. China's workers have toiled for a small fraction of the cost of their American or European competitors. However, as China's economy has expanded, its workers have become harder to find and keep, especially on the coasts where China's exporting factories are clustered. China's one-child policy has resulted in the number of young adults shrinking, resulting in labor scarcity. Moreover, although the country's inland villages contain millions of potential workers for its coastal factories, China's land policies and household registration system discourage migration to the cities. Villagers risk losing family plots if they do not tend them. They cannot enroll their children in city schools or benefit from other government services until they have been officially declared as permanent urban residents, which can take years. The supply of factory workers is not infinite, even in China.

With fewer workers heading to China's manufacturing zones, the result is upward pressure on wages. Unrest has increased in China as workers have demonstrated for higher wages: Strikes, stoppages, and suicides have afflicted companies such as Honda, which have factories on China's coast. Higher wages at home and low-wage competition from countries such as Vietnam are making it more difficult for China to maintain rapid export growth. Many economists maintain that the high growth phase will soon run out. Increasingly, China will have to rely on technology, infrastructure, and education as sources of growth.

Although higher wages will improve the lives of urban workers, they will make it more difficult for Chinese exporters of low-end merchandise like toys and apparel to continue to compete on price. Exporters will have to increase productivity to make up for higher wages and begin producing higher-end products that are less sensitive to price increases. If wages increase in China, its workers will have more money to spend, some of which will be spent on imported goods. This spending will result in increasing pressure on trade, a main drive of China's economic growth.

Consider Lever Style Inc., a Chinese manufacturer of blouses and shirts. In 2013, the firm began moving apparel production to Vietnam where wages were less than half those in China; the firm expected that Vietnam would be producing about 40 percent of its clothes within a few years. Lever Style's management considered the relocation a matter of survival. After a decade of almost 20 percent annual wage increases in China, Lever Style said that it was increasingly difficult to make money in China. As production shifts to Vietnam, Lever Style says it could offer its customers discounts up to 10 percent

per garment. That is attractive to American retailers, whose profit margins tend to average 1 percent to 2 percent. Although the move is intended to allow Levi Style's prices to be held in check, competition for labor in places like Vietnam and Cambodia is pushing up wages in those countries as well.

Another example is Levi Strauss and Company, the producer of jeans. Until the 1960s, the company manufactured solely in the United States, with its jeans becoming a symbol of the American West and demanded by teenagers throughout the world. As global competition intensified, Levi started to shift its production to China in the late 1980s to take advantage of cheap labor. Although this strategy initially worked well for Levi, by 2015, the abundance of Chinese workers willing to sew jeans for a few dimes an hour was drying up. China's working-age population has peaked, resulting in a labor shortage. Thus, wages and benefits have been increasing in double-digit percentages for the past decade as workers can command higher compensation, thus reducing China's competitiveness. This is forcing Levi, and other manufacturers located in China, to rethink their business models. In the future, Levi realizes that automation will be paramount because labor is getting more expensive and technology is getting cheaper. What's more, Levi has encountered other challenges by manufacturing in China. It takes about 30 days to ship jeans by sea and land from China to Hebron, Kentucky, where Levi has a large distribution center for the United States. This distance is long enough for the company to miss changes in fashion and realize undesired inventory. Thus, Levi is experimenting with more localized production. For example, when a line of so-called skinny jeans became popular in Europe, Levi transferred production from its Chinese factories to factories in Turkey and Poland to meet the increased demand and reduce shipping time.⁴

Another factor contributing to China's export woes is the strengthening (appreciating) yuan. As discussed in Chapter 14, the United States has long maintained that the yuan has been kept artificially low to boost China's exports and that the yuan is undervalued. However, from 2011 to 2016, the yuan's exchange value was appreciating against the dollar, which made China's goods more expensive overseas and decreased profits in local currency terms. Therefore, some low-end manufacturers were abandoning China for cheaper locations abroad.

Higher wages and a stronger yuan alone are not sufficient to cause firms to leave China. The country has the world's best supply chains of parts and components for industries, and its infrastructure works well. Moreover, China has become a huge market in its own right. Therefore, China will likely remain an attractive site for many manufacturers.

Does Trade with China Take Away Blue-Collar American Jobs?

Does trade with China take away blue-collar jobs of American workers? This has become a political hot potato in recent years. Economists David Autor, David Dorn, and Gordon Hanson have investigated this issue. What they found was that international trade, especially recent U.S. trade with China, has significantly disrupted some regional economies in the United States.

Based on the impact of globalization on America's labor market in the 1970s and 1980s, Autor and colleagues found that, although international trade affected America's labor market, the impact was minor in comparison with technological change. However, following China's surging economic growth and entry into the World Trade Organization (WTO) in

⁴Deborah Kan, *China Inc. Moves Offshore*, Reuters Video Gallery, July 20, 2011, at www.reuters.com/video/; Kathy Chu, "China Manufacturers Survive by Moving to Asian Neighbors," *The Wall Street Journal*, May 1, 2013; Kathy Chu and Bob Davis, "End of Cheap Labor: Levi Strauss and Other Global Brands Are Revamping as Wages Rise and Robots Multiply," *The Wall Street Journal*, November 23, 2015.

2001, the massive increase in American imports from China significantly affected wages and employment in the parts of the United States that produce goods that compete with China. At least 20 percent of the decrease in American factory jobs, between 1999 and 2011, was the direct result of competition from China. Moreover, the effects of trade with China have not been distributed broadly and uniformly across blue-collar workers in the United States, but are concentrated in industries and around workers and communities that produce goods that compete with the same products that China produces.

China's comparative advantage is concentrated in specific set of products such as footwear and apparel, textiles and furniture, and lower-end electronics. These goods are also produced in the northern southeast and the southern mid-west of the United States—that is, in parts of Tennessee, Kentucky, Ohio, and Pennsylvania. Therefore, the main impact of China's rise has not been spread evenly across the blue-collar labor throughout the United States, but rather in particular labor markets. This is in contrast to major exporting states, like Texas, California, and Washington, where many workers' jobs are in exporting industries.

Moreover Autor and colleagues and others show evidence that adjustment in America's regional labor markets has been quite slow, with wages and labor-force participation rates remaining depressed and unemployment rates remaining elevated for at least a decade after China's trade shock emerged. Many American workers in adversely affected industries and regions do not easily go on to better jobs, or even similar jobs in different industries. Instead, they shuffle from low-paid job to low-paid job, never recovering the prosperity they had before the advent of Chinese competition. This is in contrast to previous decades, when American workers who lost their jobs to import competition generally went into higher-productivity industries.

Does this mean that China's trade advantage is mainly the result of unfair trade practices and that international trade is, in the aggregate, harmful to nations? No, says Autor and colleagues. They note that, although China has bent the rules of trade in some instances (currency manipulation and stealing of foreign intellectual property) the main source of China's growth and its expansion in American markets is due to its enormous comparative advantage in labor-intensive goods where China has an abundant supply of labor relative to the rest of the world. However, the rise of China may be diminishing as it becomes a middle-income nation with rising wages that negate its era of cheap labor. China's comparative advantage in the future may be less about labor abundance and more about responses of business and government to an evolving economic environment.

Autor and colleagues conclude that we can't turn the dial back on globalization—it's an accomplished fact. However, the challenge for America is that it needs to think about how we can make sure that American labor markets are as flexible and as responsive as possible to help workers who are hurt by globalization find new areas of activity.⁵

Factor-Price Equalization

In Chapter 2, we learned that international trade tends to equalize product prices among trading partners. Can the same be said for resource prices?⁶

⁵David Autor, David Dorn, and Gordon Hanson, "The China Shock: Learning from Labor Market Adjustment to Large Changes in Trade," *Annual Review of Economics*, Vol. 8, September, 2016 and "Local Labor Market Effects of Import Competition in the United States," *American Economic Review* 2013, Vol 103, No. 6; Gordon Hanson, *Yes Trade with China Took Away Blue-Collar Jobs, and There's No Getting Them Back*, PBS News Hour, September 8, 2016; John O'Sullivan, "An Open and Shut Case: Special Report, the World Economy," *The Economist*, October 1, 2016.

⁶See Paul A. Samuelson, "International Trade and Equalization of Factor Prices," *Economic Journal*, June 1948, pp. 163–184, and "International Factor-Price Equalization Once Again," *Economic Journal*, June 1949, pp. 181–197.

INTERNATIONAL TRADE APPLICATION

Globalization Drives Changes for U.S. Automakers

The history of the U.S. automobile industry can be divided into distinct eras: the emergence of Ford Motor Company as a dominant producer in the early 1900s; the shift of dominance to General Motors in the 1920s; and the rise of foreign competition since the 1970s.

Foreign producers have become effective rivals of the Big Three (GM, Ford, and Chrysler), which used to be insulated from competitive pressures on their costs and product quality. The result has been a steady decrease in the Big Three's share of the U.S. automobile market from more than 70 percent in 1999 to about 45 percent in 2016. For decades, the competitive threat of foreign companies was greatest in the small-car segment of the U.S. market. Now, the Big Three also face stiff competition on the lucrative turf of pickup trucks, minivans, and sport utility vehicles.

Several factors have detracted from the cost competitiveness of the Big Three in recent years. First, the Big Three have been saddled with large pension obligations and health care costs for their workers, negotiated by the United Auto Workers (UAW) and the Big Three when times were better for these firms. These benefit costs are higher than for American workers of nonunionized Toyota and Honda, with their younger workforces and fewer retirees. Relatively high wages represented another cost disadvantage of the Big Three. Moreover, Toyota and Honda have been widely viewed as the most efficient producers of automobiles in the world.

As global competition intensified and the U.S. economy fell into the Great Recession of 2007–2009, the Big Three's sales, market share, and profitability deteriorated. In 2009, GM and Chrysler declared bankruptcy. Therefore, the UAW agreed to a series of concessions to preserve the jobs of their members. They accepted higher



premiums and copayments for health care and they set up a second tier wage for entry-level workers at about half the wage for current workers. UAW workers also agreed to suspend bonuses and cost of living increases. These adjustments brought the pay of Big Three production workers closer to that of their Japanese competitors. However, auto workers in the United States are paid much higher wages and benefits than auto workers in China, India, and South America.

Competition from foreign parts makers has also stressed the U.S. auto industry. U.S. auto manufacturers used to produce nearly all of the roughly 15,000 parts in the typical motor vehicle. Today, they purchase about 70 percent of the value added from independent parts suppliers, many of which are located in foreign countries. For example, as of 2017, the United States imported about \$140 billion in car parts, equivalent to some \$12,000 of foreign content in each American light vehicle manufactured. The inflow of low-cost foreign parts resulted in job losses for American parts workers and placed downward pressure on the wages of those Americans who continued to produce parts.

As competition in the U.S. auto market has become truly international, it is highly unlikely that the Big Three will ever regain the dominance that once allowed them to dictate which vehicles Americans bought and at what prices. Toyota and Honda will likely remain as major threats to their financial stability.

What do you think? Is it the responsibility of the U.S. government to provide tariff protection for American auto producers?

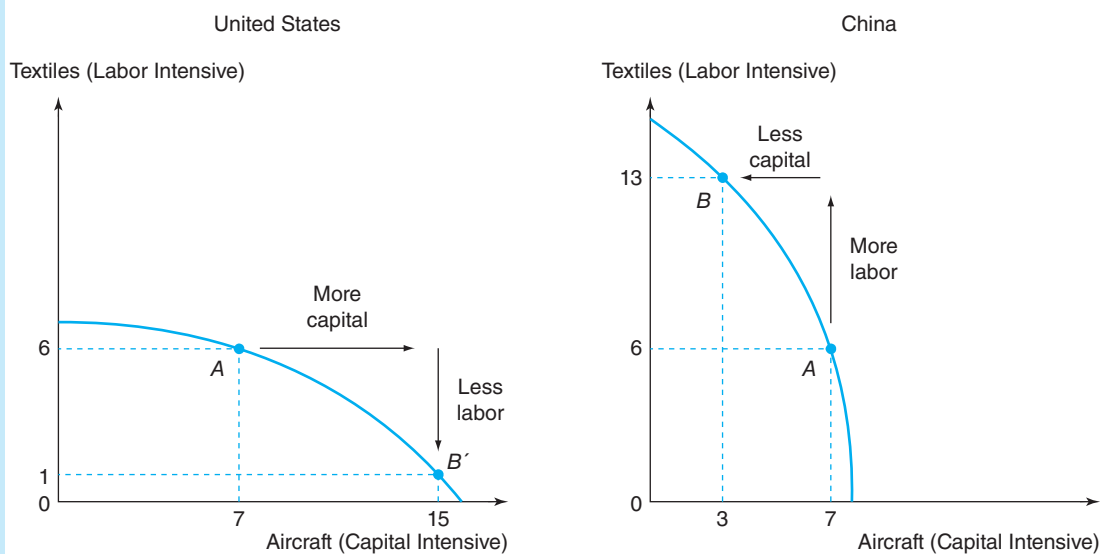
Source: U.S. Department of Labor, Bureau of Labor Statistics, "Automotive Industry: Employment, Earnings, and Hours, 2016," available at www.bls.gov.

To answer this question, consider Figure 3.2. The figure continues our example of comparative advantage in aircraft and textiles by illustrating the process of **factor-price equalization**. Recall that the Chinese demand for inexpensive American aircraft results in an increased American demand for its abundant resource, capital; the price of capital thus rises in the United States. As China produces fewer aircraft, its demand for capital decreases, and the price of capital falls. The effect of trade is to equalize the price of capital in the two nations. Similarly, the American demand for cheap Chinese textiles leads to an increased demand for labor in China, its abundant resource; the price of labor rises in China. With the

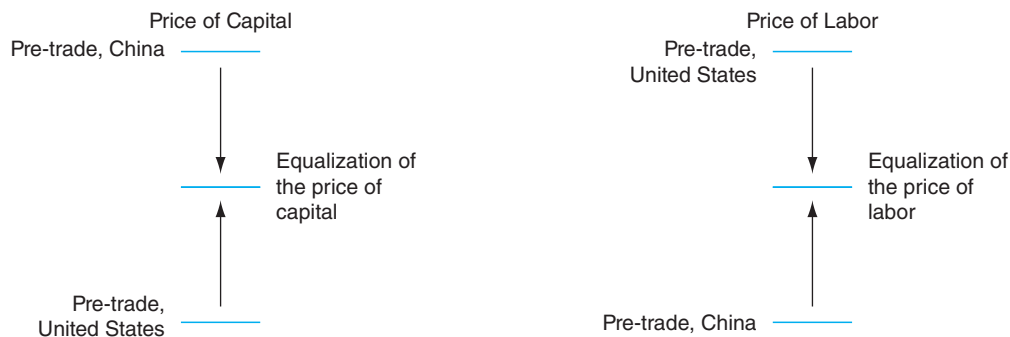
FIGURE 3.2

The Factor-Price Equalization Theory

(a) Trade Alters the Mix of Factors (Resources) Used in Production



(b) Trade Promotes Factor Prices Moving into Equality across Countries



By forcing product prices into equality, international trade also tends to force factor prices into equality across countries.

United States producing fewer textiles, its demand for labor decreases and the price of labor falls. With trade, the price of labor tends to equalize in the two trading partners. We conclude that by redirecting demand away from the scarce resource and toward the abundant resource in each nation, trade leads to factor-price equalization. In each nation, the cheap resource becomes relatively more expensive, and the expensive resource becomes relatively less expensive until price equalization occurs.

Indian computer engineers provide an example of factor-price equalization. Without immigration restrictions, the computer engineers could migrate to the United States where wage rates are much higher, thus increasing the relative supply of computer engineering

skills and lessening the upward pressure on computer engineering wages in the United States. Although such migration has occurred, it has been limited by immigration restrictions. What was the market's response to the restrictions? Computer engineering skills that could no longer be supplied through migration now arrive through trade in services. Computer engineering services occur in India and are transmitted via the Internet to business clients in the United States and other countries. In this manner, trade serves as a substitute for immigration.

The forces of globalization have begun to even things out between the United States and India. As more U.S. tech companies poured into India in the first decade of the 2000s, they soaked up the pool of high-end computer engineers who were making about 25 percent of what their counterparts earned in the United States. The result was increasing competition for the most skilled Indian computer engineers and a narrowing U.S.–India gap in their compensation. By 2007, India's Software and Service Association estimated wage inflation in its industry at 10 to 15 percent a year, while some tech executives said it was closer to 50 percent. In the United States, wage inflation in the software sector was less than 3 percent. For experienced, top-level Indian engineers, salaries increased to between \$60,000 and \$100,000 a year, pressing against salaries earned by computer engineers in the United States. Wage equalization was occurring between India and the United States. Taking into account the time difference with India, some Silicon Valley firms concluded that they were not saving any money by locating there anymore and began to bring jobs home to American workers.

Although the tendency toward the equalization of resource prices may sound plausible, in the real world, we do not see full factor-price equalization. Table 3.4 shows indexes of hourly compensation for nine countries. In 2015, wages differed by a factor of about 8 from workers in the highest wage country (Norway) to workers in the lowest wage country (Mexico). There are several reasons why differences in resource prices exist.

TABLE 3.4**Indexes of Hourly Compensation for Manufacturing Workers (U.S. = 100)**

	1997	2015
Norway	112	132
Germany	125	112
Austria	108	104
Netherlands	99	97
Canada	80	82
Japan	96	63
South Korea	40	60
Taiwan	31	25
Mexico	15	16

Source: From *International Comparisons of Hourly Compensation Costs in Manufacturing, 2013*, The Conference Board, available at <http://www.conference-board.org>.

Most income inequality across countries results from uneven ownership of human capital. The factor-endowment model assumes that all labor is identical. However, labor across countries differs in terms of human capital, which includes education, training, skill, and the like. We do not expect a computer engineer in the United States with a Ph.D. and 25 years of experience to be paid the same wage as a college graduate taking his or her first job as a computer engineer in Peru.

Also, the factor-endowment model assumes that all countries use the same technology for producing a particular good. When a new and better technology is developed, it tends to replace older technologies. This process can take a long time, especially between advanced and developing countries. Returns paid to resource owners across countries will not equalize when two countries produce the same good using different technologies. Machinery workers using superior production technologies in Germany tend to be paid more than workers using inferior production technologies in Algeria.

Transportation costs and trade barriers can prevent product prices from equalizing. Such market imperfections reduce the volume of trade, limiting the extent to which product prices and resource prices can become equal.

The fact that resource prices may not fully equalize across nations can be explained in part by assumptions underlying the factor-endowment theory that are not completely borne out in the real world.

Who Gains and Loses from Trade? The Stolper–Samuelson Theorem

Recall that in Ricardo's theory, a country as a whole benefits from comparative advantage. Also, Ricardo's assumption of labor as the only factor of production rules out an explanation of how trade affects the distribution of income among various factors of production within a nation, and why certain groups favor free trade whereas other groups oppose it. In contrast, the factor-endowment theory provides a more comprehensive way to analyze the gains and losses from trade. The theory does this by providing predictions of how trade affects the income of groups representing different factors of production such as workers and owners of capital.

The effects of trade on the distribution of income are summarized in the **Stolper–Samuelson theorem**, an extension of the theory of factor-price equalization.⁷ According to this theorem, the export of a product that embodies large amounts of a relatively cheap, abundant resource makes this resource more scarce in the domestic market. The increased demand for the abundant resource results in an increase in its price and an increase in its income. At the same time, the income of the resource used intensively in the import-competing product (the initially scarce resource) decreases as its demand falls. The increase in the income to each country's abundant resource comes at the expense of the scarce resource's income. The Stolper–Samuelson theorem states that an increase in the price of a product increases the income earned by resources that are used intensively in its production. Conversely, a decrease in the price of a product reduces the income of the resources that it uses intensively.

Note that the Stolper–Samuelson theorem does not state that all the resources used in the export industries are better off, or that all the resources used in the import-competing industries are harmed. Rather, the abundant resource that fosters comparative advantage realizes an increase in income and the scarce resource realizes a decrease in its income regardless of industry. Trade theory concludes that some people will suffer losses from free trade, even in the long term.

Although the Stolper–Samuelson theorem provides some insights regarding the income distribution effects of trade, it tells only part of the story. An extension of the Stolper–Samuelson theorem is the **magnification effect**, which suggests the change in the price of a resource is greater than the change in the price of the good that uses the resource intensively in its production process. Suppose that as the United States starts trading, the price of aircrafts increases by 6 percent and the price of textiles decreases by 3 percent. According to

⁷Wolfgang F. Stolper and Paul A. Samuelson, "Protection and Real Wages," *Review of Economic Studies*, Vol. 9, 1941, pp. 58–73.

the magnification effect, the price of capital must increase by more than 6 percent, and the price of labor must decrease by more than 3 percent. If the price of capital increases by 8 percent, owners of capital are better off because their ability to consume aircraft and textiles (that is, their real income) is increased. However, workers, because their ability to consume the two goods is decreased (their real income falls), are worse off. In the United States, owners of capital gain from free trade while workers lose.

The Stolper–Samuelson theorem has important policy implications. The theorem suggests that even though free trade may provide overall gains for a country, there are winners and losers. Given this conclusion, it is not surprising that owners of abundant resources tend to favor free trade, while owners of scarce factors tend to favor trade restrictions.

For example, the U.S. economy has an abundance of capital and skilled labor, so its comparative advantage is in producing capital-skill intensive goods. The factor-endowment model suggests that the United States will tend to export goods requiring relatively large amounts of capital and skilled labor and import goods requiring large amounts of unskilled labor. International trade in effect increases the supply of unskilled labor to the U.S. economy, lowering the wages of unskilled American workers compared to those of skilled workers. Skilled workers—who are already at the upper end of the income distribution—find their incomes increasing as exports expand, while unskilled workers are forced into accepting even lower wages in order to compete with imports. According to the factor-endowment theory, then, international trade can aggravate income inequality, at least in a country such as the United States where skilled labor is abundant. This is a reason why unskilled workers in the United States often support trade restrictions.

Despite the losses for some Americans, as the Stolper–Samuelson theorem goes, the total gains to the U.S. economy from freer trade exceed the losses to disadvantaged workers. Although the jobs and wages of lower-skilled Americans could be protected through increased tariffs, this would come at a large cost to the overall American economy. Thus, instead of protecting some industries through tariffs or quotas, which would decrease overall economic gains, the correct policy would be for the winners to compensate the losers through progressive taxation or some other form of subsidies or income transfer. This topic is further discussed in the “Trade Adjustment Assistance” section of Chapter 6.

Is International Trade a Substitute for Migration?

Immigrants provide important contributions to the U.S. economy. They help the economy grow by increasing the size of the labor force, they assume jobs at the lower end of the skill distribution where few native born Americans are available to work, and they take jobs that contribute to the United States being a leader in technological innovation. Despite these advantages, critics maintain that immigrants take jobs away from Americans, suppress domestic wages, and consume sizable amounts of public services. They contend that legal barriers are needed to lessen the flow of immigrants into the United States. If the policy goal is to reduce immigration, could international trade be used to achieve this result rather than adopting legal barriers? The factor-endowment model of Heckscher and Ohlin addresses this question.

According to the factor-endowment theory, international trade can provide a substitute for the movement of resources from one country to another in its effects on resource prices. The endowments of resources among the countries of the world are not equal. A possible market effect would be movements of capital and labor from countries where they are abundant and inexpensive to countries where they are scarce and more costly, thus decreasing the price differences.

The factor-endowment theory also supports the idea that such international movements in resources are not essential, because the international trade in products can achieve the same result. Countries that have abundant capital can specialize in capital-intensive products and export them to countries where capital is scarce. In a sense, capital is embodied in products and redistributed through international trade. The same conclusion pertains to land, labor, and other resources.

A key effect of an international movement of a resource is to change the scarcity or abundance of that resource and alter its price; that is, to increase the price of the abundant resource by making it more scarce compared to other resources. When Polish workers migrate to France, wage rates tend to increase in Poland because labor becomes somewhat more scarce there; also, wage rates in France tend to decrease (or at least increase more slowly than they would otherwise) because the scarcity of labor declines. The same outcome occurs when the French purchase Polish products that are manufactured by labor-intensive methods: Polish export industries demand more workers, and Polish wages tend to increase. In this manner, international trade can serve as a substitute for international movements of resources through its effect on resource prices.⁸

An example of international trade as a substitute for labor migration is the North American Free Trade Agreement of 1995. Signed by Canada, Mexico, and the United States, the agreement eliminated trade restrictions among the three nations. At that time, former President Bill Clinton noted that NAFTA would result in an even more rapid closing of the gap between the wage rates of Mexico and the United States. As the benefits of economic growth spread in Mexico to working people, they will have more income to buy American products and there will be less illegal immigration because more Mexicans will be able to support their children by staying home. While NAFTA may have helped lessen the flow of migrants from Mexico to the United States, other factors continued to encourage migration—high birth rates in Mexico; the collapse of the peso, which resulted in recession; and the loss of jobs to other countries, especially China, where average wages are less than half of Mexico's. Although international trade and economic growth would lessen the flow of Mexicans to the United States, achieving this result would take years, perhaps decades.

International trade and labor migration are not necessarily substitutes: They may be complements, especially over the short and medium terms. As trade expands and an economy attempts to compete with imports, some of its workers may become unemployed. The uprooting of these workers may force some of them to seek employment abroad where job prospects are better. In this manner, increased trade can result in an increase in migration flows. During the first decade of the 2000s, Mexico lost thousands of jobs to China, whose average wages were half of Mexico's and whose exports to other countries were increasing. This loss provided additional incentive for Mexican workers to migrate to the United States to find jobs. The topic of immigration is further discussed in Chapter 9.

Specific-Factors Theory: Trade and the Distribution of Income

A key assumption of the factor-endowment model, and its Stolper–Samuelson theorem, is that resources such as labor and capital can move effortlessly among industries within a country while they are completely immobile among countries. For example, Japanese workers are assumed to be able to shift back and forth between automobile and rice production in Japan, although they cannot move to China to produce these goods.

Although such factor mobility among industries may occur in the long run, many factors are immobile in the short run. Physical capital (such as factories and machinery) is generally used for specific purposes; a machine designed for computer production cannot

⁸Robert Mundell, "International Trade and Factor Mobility," *American Economic Review*, June 1957.

suddenly be used to manufacture jet aircraft. Similarly, workers often acquire certain skills suited to specific occupations and cannot immediately be assigned to other occupations. These types of factors are known in trade theory as **specific factors**. Specific factors are those that cannot move easily from one industry to another. Thus, the **specific-factors theory** analyzes the income distribution effects of trade in the short run when resources are immobile among industries. This is in contrast to the factor-endowment theory, and its Stolper–Samuelson theorem, that apply to the long-run mobility of resources in response to differences in returns.

The specific-factors theory concludes that resources specific to import-competing industries tend to lose as a result of trade—their incomes go down. Yet resources specific to export industries tend to gain as a result of trade—their incomes go up.

To understand the specific-factors theory, assume that basic oxygen furnaces (capital) are specific to producing steel and labor is mobile between the steel industry and the computer industry. Also assume that assembly robots are specific to producing computers. Finally, suppose that the United States has a comparative disadvantage in steel and a comparative advantage in computers.

With the opening of trade, as steel is imported the production of steel decreases in the United States. American workers that are laid off in the steel industry will move to take jobs with computer companies. What will be the effects of trade on the distribution of income in the United States?

With trade, the price of steel will decrease as steel is imported. Also, the demand for basic oxygen furnaces declines as the production of steel falls. This implies that the return (income) to basic oxygen furnaces falls.

steel price	→	demand for basic	→	income of basic
declines		oxygen furnaces		oxygen furnaces
		declines		declines

Also, the price of computers will increase as computers are exported and the demand for assembly robots rises as more computers are produced. Therefore, the return (income) to assembly robots increases.

computer	→	demand for	→	income of price
increases		assembly robots		assembly robots
		increases		increases

Therefore, the incomes to resources specific to importing-competing industries (basic oxygen furnaces) fall as a result of trade, while the resources specific to export industries (assembly robots) see their incomes rising.

So far we have considered the effects of trade on the incomes of the specific factors, the basic oxygen furnace and assembly robots. Now we will consider the income effect of trade for labor, the mobile factor. It turns out that this effect is indeterminate. Labor may gain or lose, depending in part on whether workers mainly consume steel, the good whose price decreases, or computers, the good whose price increases. In the former case, workers are likely to gain as a result of trade; in the latter case, workers are more likely to lose. Thus, the mobile factor gains or loses from trade depending on its consumption patterns. But in the long run, when all factors are mobile, each factor will gain or lose depending on whether it is relatively scarce or abundant.

The specific-factors theory helps explain Japan's rice policy. Japan permits only small quantities of rice to be imported, even though rice production in Japan is more costly than in other nations such as the United States. It is widely recognized that Japan's overall welfare

would rise if free imports of rice were permitted. However, free trade would harm Japanese farmers. Although rice farmers displaced by imports might find jobs in other sectors of Japan's economy, they would find changing employment to be time consuming and costly. Moreover, as rice prices decrease with free trade, so would the value of Japanese farming land. It is no surprise that Japanese farmers and landowners strongly object to free trade in rice; their unified political opposition has influenced the Japanese government more than the interests of Japanese consumers.

This analysis also helps us understand the motivations of displaced manufacturing workers in Midwestern states such as Ohio, Michigan, and Pennsylvania. As exports of manufactured goods surged into the United States, following China's entry into the WTO in 2001, many American manufacturing workers lost their jobs. Often, the training and skills of these workers were "specific" to the manufacturing companies for which they worked. Many of these workers did not have college educations and thus had few good job prospects in other industries. Also, they were often tied to their families and were too old to move elsewhere. Thus, these workers were immobile. As they faced falling incomes and rising unemployment, they looked to the U.S. government for assistance. This might come in the form of tariff protection against manufactured goods imported from China, Mexico, and other countries that were making inroads in America's manufacturing market. An alternative way of helping these workers would be for government to provide them with educational and training grants to increase their job mobility. This topic is further discussed in Chapter 6—see trade adjustment assistance. *Exploring Further 3.1* provides a more detailed presentation of the specific-factors theory; it can be found in MindTap.

Does Trade Make the Poor Even Poorer?

Before leaving the factor-endowment theory, consider this question: Is your income pulled down by workers in Mexico or China? That question has underlined many Americans' fears about their economic future. They worry that the growth of trade with low-wage developing nations could reduce the demand for low-skilled workers in the United States and cause unemployment and wage decreases for U.S. workers.

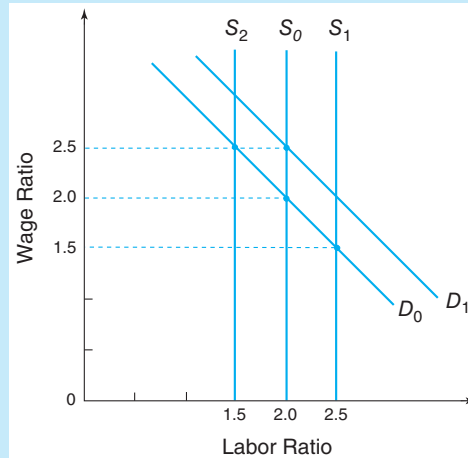
The wage gap between skilled and unskilled workers has widened in the United States during the past 40 years. Over the same period, imports increased as a percentage of gross domestic product. These facts raise two questions: Is trade harming unskilled workers? If it is, then is this an argument for an increase in trade barriers?

Economists agree that some combination of trade, technology, education, immigration, and union weakness has held down wages for unskilled American workers; but apportioning the blame is tough, partly because income inequality is so pervasive. Economists have attempted to disentangle the relative contributions of trade and other influences on the wage discrepancy between skilled workers and unskilled workers. Their approaches share the analytical framework shown by Figure 3.3. This framework views the wages of skilled workers "relative" to those of unskilled workers as the outcome of the interaction between supply and demand in the labor market.

The vertical axis of Figure 3.3 shows the wage ratio that equals the wage of skilled workers divided by the wage of unskilled workers. The figure's horizontal axis shows the labor ratio, which equals the quantity of skilled workers available divided by the quantity of unskilled workers. Initially we assume that the supply curve of skilled workers relative to unskilled workers is fixed and is denoted by S_0 . The demand curve for skilled workers relative to unskilled workers is denoted by D_0 . The equilibrium wage ratio is 2.0, found at the intersection of the supply and demand curves, and suggests that the wages of skilled workers are twice as much as the wages of unskilled workers.

FIGURE 3.3

Inequality of Wages between Skilled and Unskilled Workers



By increasing the demand for skilled relative to unskilled workers, expanding trade or technological improvements result in greater inequality of wages between skilled and unskilled workers. Also, immigration of unskilled workers intensifies wage inequality by decreasing the supply of skilled workers relative to unskilled workers. However, expanding opportunities for college education result in an increase in the supply of skilled relative to unskilled workers, thus reducing wage inequality. In the figure, the wage ratio equals wage of skilled workers/wage of unskilled workers. The labor ratio equals the quantity of skilled workers/quantity of unskilled workers.

In the figure, a shift in either the supply curve or demand curve of skilled workers available relative to unskilled workers will induce a change in the equilibrium wage ratio. Let us consider resources that can affect wage inequality in the United States.

- International trade, offshoring, and technological change.* Trade liberalization and falling transportation and communication costs result in an increase in the demand curve of skilled workers relative to unskilled workers, say, to D_1 in the figure. Assuming a constant supply curve, the equilibrium wage ratio rises to 2.5, suggesting that the wages of skilled workers are 2.5 times as much as the wages of unskilled workers. Similarly, skill-biased technological improvements lead to an increase in the demand for skilled workers relative to unskilled workers, thus promoting higher degrees of wage inequality.
- Immigration.* Immigration of unskilled workers results in a decrease in the supply of skilled workers relative to unskilled workers. Assuming that the demand curve is constant, as the supply curve shifts from S_0 to S_2 , the equilibrium wage ratio rises to 2.5, thus intensifying wage inequality.
- Education and training.* As the availability of education and training increases, so does the ratio of skilled workers to unskilled workers, as seen by the increase in the supply curve from S_0 to S_1 . If the demand curve remains constant, then the equilibrium wage ratio will fall from 2.0 to 1.5. Additional opportunities for education and training thus serve to reduce the wage inequality between skilled and unskilled workers.

We have seen how trade, offshoring, immigration, technological change, and education can promote wage inequality. One often cited study by William Cline estimated that during 1973–1993 technological change was about four times more powerful in widening wage inequality in the United States than trade, and that trade accounted for only 7.0 percentage points of all the unequalizing forces at work during that period. His conclusions were reinforced by the research of Robert Lawrence that concluded rising wage inequality during the first decade of the 2000s more closely corresponds to asset market performance and technological and institutional innovations than to international trade in goods and services.⁹ This point is further discussed in the next section of this textbook.

Is International Trade Responsible for the Loss of American Manufacturing Jobs? How about Robots Instead?

U.S. President Donald Trump has blamed China and Mexico for stealing millions of jobs from American workers. Is he correct? Perhaps Trump should also look at new technologies and robots as an answer.

This is because American factories do not require as many workers as they used to as machines now do so much of the work. Compared to the peak of American manufacturing employment in 1979, the United States lost more than 7 million factory jobs by 2016. However, U.S. factory production more than doubled over this period to \$1.91 trillion, according to the Commerce Department (which uses 2009 dollars to adjust for inflation).

Critics such as Trump are correct that international trade has cost some American factory jobs, especially after China joined the WTO in 2001 and gained easier access to American markets. And American industries that are labor intensive, like furniture manufacturing and textiles, have been especially harmed by foreign competition.

However, economists have found that the automation of American factories is a much more important factor than international trade in the loss of American factory jobs. For example, a 2015 study by economists at Ball State University's Center for Business and Economic Research found that international trade accounted for just 13 percent of American job losses in the last decade. The vast majority of the lost jobs, some 87 percent, were taken by robots and other domestic factors that result in a decrease in the need for human workers by factories. This estimate closely matches those of many other research centers throughout the United States. Simply put, the United States is producing more with fewer workers.

For example, from 1997 to 2017 the U.S. steel industry lost about 265,000 jobs in the production of primary steel metals, a 42 percent decline. Yet this occurred at a time when steel production in the United States increased by 38 percent. American steel jobs vanished largely as a result of a new technology, highly efficient mini-mills that produce steel mainly from scrap metal. Or consider General Motors Corporation. The firm now employs only a third of the 600,000 workers it hired during the 1970s. Yet GM produces more automobiles and trucks than ever before.

And the robot revolution is still in its infancy. The Boston Consulting Group estimates that the share of tasks performed by robots will increase from a global average of 10 percent in 2015 to about 25 percent across all manufacturing industries by 2025. As robots become more affordable and easier to program, a greater number of small manufacturers will be able to deploy them and integrate them more deeply into industrial supply chains. And robot

⁹William Cline, *Trade and Income Distribution*, Institute for International Economics, Washington, DC, 1997, p. 264; and Robert Lawrence, *Blue-Collar Blues: Is Trade to Blame for Rising U.S. Income Inequality?*, Institute for International Economics, Washington, DC, 2008, pp. 73–74.

costs are falling. For example, the average cost of owning and operating a robotic spot welder fell from \$182,000 in 2005 to \$133,000 in 2014 and is estimated to decline to \$103,000 by 2025, according to the Boston Consulting Group. This means that robots will reduce labor costs by 22 percent in the United States, 25 percent in Japan, and 33 percent in South Korea, the firm estimates.

Yet the rise of machines provides advantages for some American workers. The increased use of robots, combined with rising labor costs in China and other developing nations, has lessened the incentive for businesses to chase low-wage labor around the world. Some businesses have been returning to the United States, taking advantage of the savings provided by robots, cheap energy, and the chance to locate closer to customers.¹⁰

Is the Factor-Endowment Theory a Good Predictor of Trade Patterns? The Leontief Paradox

Following the development of the factor-endowment theory, little empirical evidence was brought to bear about its validity. All that came forth were intuitive examples such as labor abundant India exporting textiles or shoes; capital abundant Germany exporting machinery and automobiles; or land abundant Australia exporting wheat and meat. However, some economists demanded stronger evidence concerning the validity of the factor-endowment theory.

The first attempt to investigate the factor-endowment theory empirically was undertaken by Wassily Leontief in 1954.¹¹ It had been widely recognized that in the United States, capital was relatively abundant and labor was relatively scarce. According to the factor-endowment theory, the United States will export capital-intensive goods and its import-competing goods will be labor intensive. Leontief tested this proposition by analyzing the capital/labor ratios for some 200 export industries and import-competing industries in the United States, based on trade data for 1947. Leontief found that the capital/labor ratio for U.S. export industries was lower (about \$14,000 per worker year) than that of its import-competing industries (about \$18,000 per worker year). Leontief concluded that exports were *less* capital intensive than import-competing goods. These findings, which contradicted the predictions of the factor-endowment theory, became known as the **Leontief paradox**. To strengthen his conclusion, Leontief repeated his investigation in 1956 only to again find that U.S. import-competing goods were more capital intensive than U.S. exports. Leontief's discovery was that America's comparative advantage was something other than capital-intensive goods.

The doubt cast by Leontief on the factor-endowment theory sparked many empirical studies. These tests have been mixed. They conclude that the factor-endowment theory is relatively successful in explaining trade between industrialized and developing countries. The industrialized countries export capital-intensive (and temperate-climate land-intensive) products to developing countries, and import labor- and tropical land-intensive goods from them. However, a large amount of international trade is not between industrialized and developing countries, but among industrialized countries with similar resource endowments. This suggests that the determinants of trade are more complex than those illustrated

¹⁰Paul Wiseman, "Mexico Taking U.S. Factory Jobs? Blame Robots Instead," *PBS Newshour*, November 2, 2016; Michael Hicks and Srikant Devaraj, *The Myth and the Reality of Manufacturing in America*, Center for Business and Economic Research, Ball State University, June 2015; Harold Sirkin, Michael Zinser, and Justin Rose, *The Robotics Revolution: The Next Great Leap in Manufacturing*, Boston Consulting Group, September 23, 2015.

¹¹Wassily W. Leontief, "Domestic Production and Foreign Trade: The American Capital Position Reexamined," *Proceedings of the American Philosophical Society*, 97, September 1953.

in the basic factor-endowment theory. Factors such as technology, economies of scale, demand conditions, imperfect competition, and a time dimension to comparative advantage must also be considered. In the following sections, we will examine these factors.

One resolution of the Leontief paradox depends on the definition of capital. The exports of the United States are not intensive in capital such as tools and factories. Instead, they are skill intensive, meaning that they are intensive in “human capital.” U.S. exporting industries use a significantly higher proportion of highly educated workers to other workers as compared to U.S. import-competing industries. Boeing represents one of America’s largest exporting companies. Boeing employs large numbers of mechanical and computer engineers having graduate degrees relative to the number of manual workers. Conversely, Americans import lots of shoes and textiles that are often manufactured by workers with little formal education. In general, countries endowed with highly educated workers have their exports concentrated in skill-intensive goods, while countries with less educated workers export goods that require little skilled labor.

Economies of Scale and Comparative Advantage

For some goods, economies of scale may be a source of comparative advantage.

Economies of scale (increasing returns to scale) exist when expansion of the scale of production capacity of a firm or industry causes total production costs to increase less proportionately than output. Therefore, long-run average costs of production decrease. Economies of scale are classified as internal economies and external economies.¹²

Internal Economies of Scale

Internal economies of scale arise within a firm itself and are built into the shape of its long-run average cost curve. For an automobile producer, the first auto is expensive to produce, but each subsequent auto costs much less than the one before because the large setup costs can be spread across all units. Companies such as Toyota reduce unit costs because of labor specialization, managerial specialization, efficient capital, and other factors. As the firm expands its output by increasing the size of its plant, it slides downward along its long-run average cost curve because of internal economies of scale.

Figure 3.4 illustrates the effect of economies of scale on trade. Assume that a U.S. auto firm and a Mexican auto firm are each able to sell 100,000 vehicles in their respective countries. Also assume that identical cost conditions result in the same long-run average cost curve for the two firms, AC. Note that scale economies result in decreasing unit costs over the first 275,000 autos produced.

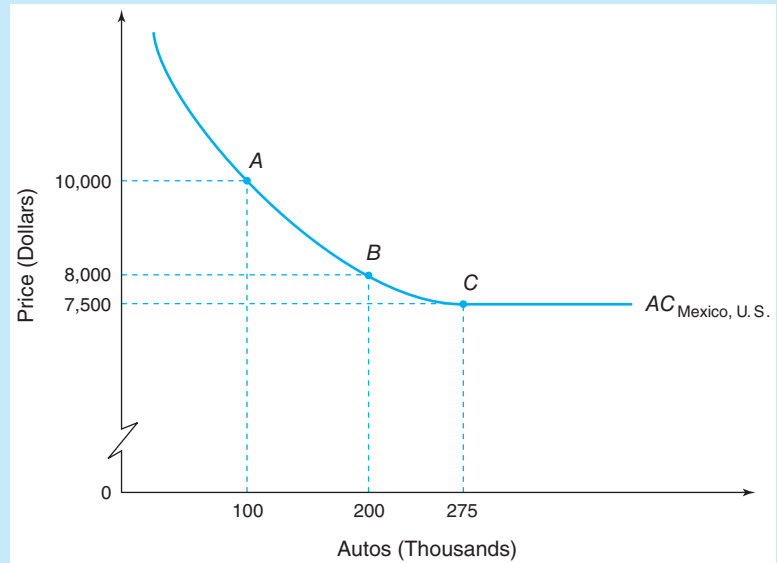
Initially, there is no basis for trade, because each firm realizes a production cost of \$10,000 per auto. Suppose that rising income in the United States results in demand for 200,000 autos, while the Mexican auto demand remains constant. The larger demand allows the U.S. firm to produce more output and take advantage of economies of scale. The firm’s cost curve slides downward until its cost equals \$8,000 per auto. Compared to the Mexican firm, the U.S. firm can produce autos at a lower cost. With free trade, the United States will now export autos to Mexico.

Internal economies of scale provide additional cost incentives for *specialization* in production. Instead of manufacturing only a few units of each product that domestic consumers desire to purchase, a country specializes in the manufacture of large amounts of

¹²Paul Krugman, “New Theories of Trade Among Industrial Countries,” *American Economic Review* 73, no. 2, May 1983, pp. 343–347; and Elhanan Helpman, “The Structure of Foreign Trade,” *Journal of Economic Perspectives* 13, no. 2, Spring 1999, pp. 121–144.

FIGURE 3.4

Internal Economies of Scale as a Basis for Trade



By adding to the size of the domestic market, international trade permits longer production runs by domestic firms, which can lead to greater efficiency and reductions in unit costs.

a limited number of goods and trades for the remaining goods. Specialization in a few products allows a manufacturer to benefit from longer production runs that lead to decreasing average costs.

A key aspect of increasing-returns trade theory is the **home market effect**: Countries will specialize in products that have a large domestic demand. Why? By locating close to its largest market, an industry can minimize the cost of shipping its products to its customers while still taking advantage of economies of scale. Auto companies will locate in Germany rather than France if it is clear that Germans are likely to buy more cars. That way the company can produce low-cost cars and not have to pay much to ship them to its largest market.

But the home market effect also has a disturbing implication. If industries tend to locate near their largest markets, what happens to small market areas? Other things equal, they're likely to become unindustrialized as factories and industries move to take advantage of scale economies and low transportation costs. Hence, trade could lead to small countries and rural areas becoming peripheral to the economic core; the backwater suppliers of commodities. As Canadian critics have phrased it, "With free trade, Canadians would become hewers of wood and drawers of water." However, other things are not strictly equal: Comparative-advantage effects exist alongside the influence of increasing returns, so the end result of open trade is not a foregone conclusion.

External Economies of Scale

The previous section considered how internal economies of scale that are *within* the control of a firm can be a source of comparative advantage. Economies of scale can also rise *outside* a firm, but within an industry. For example, when an industry's scope of operations expands

because of the creation of a better transportation system, the result is a decrease in cost for a company operating within that industry.

External economies of scale exist when the *firm's* average costs decrease as the *industry's* output increases. This cost reduction could be caused by a decrease in the prices of the resources employed by the firm or in the amount of resources per unit of output. This effect is shown by a downward shift of the firm's long run average cost curve. External economies of scale can occur in a number of situations:

- The rising concentration of an industry's firms in a particular geographic area attracts larger pools of a specialized type of worker needed by the industry, thus reducing the cost of hiring for a firm.
- New knowledge about production technology spreads among firms in the area through direct contacts among firms or as workers transfer from firm to firm. Rather than having to pay a consultant, a firm may be able to pick up useful technical knowledge from its workers mixing with workers of other firms.
- If a country has an expanding industry, it will be a source of economic growth, and through this, the government can collect additional tax revenues. Recognizing this, the government can invest in better research and development facilities at local universities so that several businesses in that area can benefit.
- Access to specialized inputs increases with the clustering of component suppliers close to the center of manufacturing. Many auto component suppliers locate in the Detroit–Windsor area where General Motors, Ford, and Chrysler produce automobiles. With the increase in the number of suppliers come increased competition and a lower price of components for an auto company.

External economies of scale help explain why New York has a comparative advantage in financial services, California's Silicon Valley has a comparative advantage in semiconductors, and Hollywood has a comparative advantage in movies.

External economies of scale have resulted in Dalton, Georgia, becoming the carpet manufacturing capital of the world. The location of the carpet industry in Dalton can be traced back to a wedding gift given in 1895 by a teenage girl, Catherine Whitener, to her brother and his bride. The gift was an unusual tufted bedspread. Copying a quilt pattern, Catherine sewed thick cotton yarns with a running stitch into unbleached muslin, clipped the ends of the yarn so they would fluff out, and washed the spread in hot water to hold the yarns by shrinking the fabric. Interest grew in Catherine's bedspreads, and in 1900, she made the first sale of a spread for \$2.50. Demand became so great for the spreads that by the 1930s, local women had haulers take the stamped sheeting and yarns to front porch workers. Often entire families worked to hand tuft the spreads for \$0.10 to \$0.25 per spread. Nearly 10,000 local men, women, and children were involved in the industry. When mechanized carpet making was developed after World War II, Dalton became the center of the new industry because specialized tufting skills were required and the city had a ready pool of workers with those skills, thus reducing hiring costs.

Dalton is now home to more than 170 carpet plants, 100 carpet outlet stores, and more than 30,000 people employed by these firms. Supporting the carpet industry are local yarn manufacturers, machinery suppliers, dye plants, printing shops, and maintenance firms. The local workforce has acquired specialized skills for operating carpet-making equipment. Because firms that are located outside of Dalton cannot use the suppliers or the skilled workers available to factories in Dalton, they tend to have higher production costs. Although there is no particular reason why Dalton became the carpet-making capital of the world, external economies of scale provided the area with a comparative advantage in carpet making once firms established there.

INTERNATIONAL TRADE APPLICATION

Does a “Flat World” Make Ricardo Wrong?

The possibility that the United States could lose from free trade is at the heart of some recent critiques of globalization. One critique contends that the world has tended to become “flat” as comparative advantages have dwindled or dried up. Proponents of this view note that as countries such as China and India undergo economic development and become more similar to the United States, a level playing field emerges. The flattening of the world is largely due to countries becoming interconnected as the result of the Internet, wireless technology, search engines, and other innovations. Consequently, capitalism has spread like wildfire to China, India, and other countries where factory workers, engineers, and software programmers are paid a fraction of what their American counterparts are paid. As China and India develop and become more similar to the United States, the United States could become worse off with trade.



However, not all economists agree with this view. They see several problems with this critique. First, the general view of globalization is that it is a phenomenon marked by increased international economic interdependence. However, the above critique is of a situation in which development in China and India leads to less trade, not more. If China and the United States have differences that allow for gains from trade (for example, differences in technologies and productive capabilities), then removing those differences may decrease the amount of trade and thus decrease the gains from that trade. The worst case scenario in this situation would be a complete elimination of trade. This is the opposite of the typical concern that globalization involves an overly rapid pace of international economic interdependence.

The second problem with the critique is that it ignores the ways in which modern trade differs from Ricardo's simple model. The advanced nations of the world have substantially similar technology and factors of production, and seemingly similar products such as automobiles and

electronics are produced in many countries, with substantial trade back and forth. This is at odds with the simplest prediction of the Ricardian model, under which trade should disappear once each country is able to make similar products at comparable prices. Instead, the world has observed substantially increased trade since the end of World War II. This increase reflects

the fact that there are gains to *intra-industry trade*, in which broadly similar products are traded in both directions between nations; for example, the United States both imports and exports computer components. Intra-industry trade reflects the advantages garnered by consumers and firms from the increased varieties of similar products made available by trade, as well as the increased competition and higher productivity spurred by trade. Given the historical experience that trade flows have continued to increase between advanced economies even as production technologies have become more similar, one would expect the potential for mutually advantageous trade to remain even if China and India were to develop so rapidly as to have similar technologies and prices as the United States.

Finally, it is argued that the world is not flat at all. While India and China may have very large labor forces, only a small fraction of Indians are prepared to compete with Americans in industries like information technology, while China's authoritarian regime is not compatible with the personal computer. The real problem is that comparative advantage can change very rapidly in a dynamic economy. Boeing might win today, Airbus tomorrow, and then Boeing may be back in play again.

What do you think? Has the world become more flat regarding the drying up of comparative advantages?

Sources: Thomas Friedman, *The World Is Flat* (New York: Farrar, Straus and Giroux, 2005); Jagdish Bhagwati, *In Defense of Globalization* (New York: Oxford University Press, 2004); Martin Wolf, *Why Globalization Works* (New Haven, CT: Yale University Press, 2004); and *Economic Report of the President*, 2005, pp. 174–175.

Overlapping Demands as a Basis for Trade

The home market effect has implications for another theory of trade, the **theory of overlapping demands**. This theory was formulated by Staffan Linder, a Swedish economist in the 1960s.¹³ According to Linder, the factor-endowment theory has considerable

¹³Staffan B. Linder, *An Essay on Trade and Transformation* (New York: Wiley, 1961), Chapter 3.

explanatory power for trade in primary products (natural resources) and agricultural goods. It does not explain trade in *manufactured goods* because the main force influencing the manufactured-good trade is domestic *demand conditions*. Because much of international trade involves manufactured goods, demand conditions play an important role in explaining overall trade patterns.

Linder states that firms within a country are generally motivated to manufacture goods for which there is a large domestic market. This market determines the set of goods that these firms will have to sell when they begin to export. The foreign markets with greatest export potential will be found in nations with consumer demand similar to those of domestic consumers. A nation's exports are thus an extension of the production for the domestic market.

Going further, Linder contends that consumer demand is conditioned strongly by their income levels. A country's average or *per capita income* will yield a particular pattern of demand. Nations with high per capita incomes will demand high-quality manufactured goods (luxuries), while nations with low per capita incomes will demand lower-quality goods (necessities).

The Linder hypothesis explains which nations will most likely trade with each other. Nations with similar per capita incomes will have overlapping demand structures and will likely consume similar types of manufactured goods. Wealthy (industrial) nations are more likely to trade with other wealthy nations, and poor (developing) nations are more likely to trade with other poor nations.

Linder does not rule out all trade in manufactured goods between wealthy and poor nations. Because of unequal income distribution within nations, there will always be some overlapping of demand structures; some people in poor nations are wealthy, and some people in wealthy nations are poor. However, the potential for trade in manufactured goods is small when the extent of demand overlap is small.

Linder's theory is in rough accord with the facts. A high proportion of international trade in manufactured goods takes place among the relatively high-income (industrial) nations: Japan, Canada, the United States, and the European nations. Much of this trade involves the exchange of similar products: Each nation exports products that are much like the products it imports. However, Linder's theory is not borne out by developing country trade. The bulk of lower-income, developing countries tend to have more trade with high-income countries than with lower-income countries.

Intra-industry Trade

The trade models considered so far have dealt with **inter-industry trade**—the exchange between nations of products of different industries. Examples include computers and aircraft traded for textiles and shoes, or finished manufactured items traded for primary materials. Inter-industry trade involves the exchange of goods with *different* factor requirements. Nations having large supplies of skilled labor tend to export sophisticated manufactured products, while nations with large supplies of natural resources export resource-intensive goods. Much of inter-industry trade is between nations having vastly different resource endowments (such as developing countries and industrial countries) and can be explained by the principle of comparative advantage (the Heckscher–Ohlin model).

Inter-industry trade is based on **inter-industry specialization**: Each nation specializes in a particular industry (say, steel) in which it enjoys a comparative advantage. As resources shift to the industry with a comparative advantage, certain other industries having comparative disadvantages (say, electronics) contract. Resources move geographically to the

industry where comparative costs are lowest. As a result of specialization, a nation experiences a growing *dissimilarity* between the products that it exports and the products it imports.

Although some inter-industry specialization occurs, this generally has not been the type of specialization that industrialized nations have undertaken in the post–World War II era. Rather than emphasizing entire industries, industrial countries have adopted a narrower form of specialization. They have practiced **intra-industry specialization**, focusing on the production of particular products or groups of products within a given industry (for example, subcompact autos rather than full-size sedans). With intra-industry specialization, the opening up of trade does not generally result in the elimination or wholesale contraction of entire industries within a nation; however, the range of products produced and sold by each nation changes.

Advanced industrial nations have increasingly emphasized **intra-industry trade**—two-way trade in a similar commodity. Computers manufactured by IBM are sold abroad, while the United States imports computers produced by Hitachi of Japan. Table 3.5 provides examples of intra-industry trade for the United States. As the table indicates, the United States is involved in two-way trade in many goods such as airplanes and computers.

TABLE 3.5

Intra-industry Trade Examples: Selected U.S. Exports and Imports, 2016
(in millions of dollars)

Category	Exports	Imports
Food and beverages	130,703	130,260
Industrial supplies	397,756	443,767
Capital goods	579,366	589,972
Automotive	149,978	350,256
Consumer goods	193,646	583,791

Source: From U.S. Census Bureau, *U.S. International Trade in Goods and Services, End-Use Categories and Commodities: FT 900*, 2016.

The existence of intra-industry trade appears to be *incompatible* with the models of comparative advantage previously discussed. In the Ricardian and Heckscher–Ohlin models, a country does not simultaneously export and import the same product. California is a major importer of French wines as well as a large exporter of its own wines; the Netherlands imports Lowenbrau beer while exporting Heineken. Intra-industry trade involves flows of goods with *similar* factor requirements. Nations that are net exporters of manufactured goods embodying sophisticated technology also purchase such goods from other nations. Most of the intra-industry trade is conducted among industrial countries, especially those in Western Europe, whose resource endowments are similar. The firms that produce these goods tend to be oligopolies, with a few large firms constituting each industry.

Intra-industry trade includes trade in *homogeneous goods* as well as in differentiated products. For *homogeneous goods*, the reasons for intra-industry trade are easy to grasp. A nation may export and import the same product because of *transportation costs*. Canada and the United States, for example, share a border whose length is several thousand miles. To minimize transportation costs (and thus total costs), a buyer in Albany, New York, may import cement from a firm in Montreal, Quebec, while a manufacturer in Seattle, Washington, sells

cement to a buyer in Vancouver, British Columbia. Such trade can be explained by the fact that it is less expensive to transport cement from Montreal to Albany than to ship cement from Seattle to Albany.

Another reason for intra-industry trade in homogeneous goods is *seasonal*. The seasons in the Southern Hemisphere are opposite those in the Northern Hemisphere. Brazil may export seasonal items (such as agricultural products) to the United States at one time of the year and import them from the United States at another time during the same year. Differentiation in time also affects electricity suppliers. Because of heavy fixed costs in electricity production, utilities attempt to keep plants operating close to full capacity, meaning that it may be less costly to export electricity at off-peak times when domestic demand is inadequate to ensure full-capacity utilization and import electricity at peak times.

Although some intra-industry trade occurs in homogeneous products, available evidence suggests that most intra-industry trade occurs in *differentiated products*. Within manufacturing, the levels of intra-industry trade appear to be especially high in machinery, chemicals, and transportation equipment. A significant share of the output of modern economies consists of differentiated products within the same broad product group. Within the automobile industry, a Ford is not identical to a Honda, a Toyota, or a Chevrolet. Two-way trade flows can occur in differentiated products within the same broad product group.

For industrial countries, intra-industry trade in differentiated manufactured goods often occurs when manufacturers in each country produce for the “majority” consumer demand within their country while ignoring “minority” consumer demand. This unmet need is fulfilled by imported products. Most Japanese consumers prefer Toyotas to General Motors vehicles; yet some Japanese consumers purchase vehicles from General Motors, while Toyotas are exported to the United States. Intra-industry trade increases the range of choices available to consumers in each country, as well as the degree of competition among manufacturers of the same class of product in each country.

Intra-industry trade in differentiated products can also be explained by overlapping demand segments in trading nations. When U.S. manufacturers look overseas for markets in which to sell, they often find them in countries having market segments that are similar; for example, luxury automobiles sold to high-income buyers. Nations with similar income levels can be expected to have similar tastes, and thus sizable overlapping market segments as envisioned by Linder’s theory of overlapping demand; they are expected to engage heavily in intra-industry trade.

Besides marketing factors, economies of scale associated with differentiated products also explain intra-industry trade. A nation may enjoy a cost advantage over its foreign competitor by specializing in a few varieties and styles of a product (for example, sub-compact autos with a standard transmission and optional equipment), while its foreign competitor enjoys a cost advantage by specializing in other variants of the same product (subcompact autos with automatic transmission, air conditioning, DVD player, and other optional equipment). Such specialization permits longer production runs, economies of scale, and decreasing unit costs. Each nation exports its particular type of auto to the other nation, resulting in two-way auto trade. In contrast to inter-industry trade that is explained by the principle of comparative advantage, intra-industry trade can be explained by *product differentiation and economies of scale*.

With intra-industry specialization, fewer adjustment problems are likely to occur than with inter-industry specialization, because intra-industry specialization requires a shift of resources within an industry instead of between industries. Inter-industry specialization results in a transfer of resources from import-competing to export-expanding sectors of the economy. Adjustment difficulties can occur when resources, notably labor, are occupationally and geographically immobile in the short term; massive structural unemployment may result. In contrast, intra-industry specialization often occurs without requiring

workers to exit from a particular region or industry (as when workers are shifted from the production of large-size automobiles to subcompacts); the probability of structural unemployment is lessened.

Technology as a Source of Comparative Advantage: The Product Cycle Theory

The explanations of international trade presented so far are similar in that they presuppose a *given* and unchanging state of technology that the process firms use to turn inputs into goods and services. The basis for trade was ultimately attributed to such factors as differing labor productivities, factor endowments, and national demand structures. In a dynamic world, technological changes occur in different nations at different rates of speed. Technological innovations commonly result in new methods of producing existing commodities, production of new commodities, or commodity improvements. These factors can affect comparative advantage and the pattern of trade.

Japanese automobile companies such as Toyota and Honda have succeeded by greatly improving the processes for designing and manufacturing automobiles. This improvement allowed Japan to become the world's largest exporter of automobiles, selling large numbers to Americans and people in other countries. Japan's comparative advantage in automobiles has been supported by the superior production techniques developed by that country's manufacturers that allowed them to produce more vehicles with a given amount of capital and labor than their European or American counterparts. Therefore, Japan's comparative advantage in automobiles is caused by differences in technology; the techniques in production.

Although differences in technology are an important source of comparative advantage at a particular point in time, technological advantage is often transitory. A country may lose its comparative advantage as its technological advantage disappears. Recognition of the importance of such dynamic changes has given rise to another explanation of international trade: the **product life cycle theory**. This theory focuses on the role of technological innovation as a key determinant of the trade patterns in manufactured products.¹⁴ According to this theory, many manufactured goods such as electronic products and office machinery undergo a predictable *trade cycle*. During this cycle, the home country initially is an exporter, then loses its competitive advantage to its trading partners and eventually may become an importer of the commodity. The stages that many manufactured goods go through comprise the following:

1. Manufactured good is introduced to home market.
2. Domestic industry shows export strength.
3. Foreign production begins.
4. Domestic industry loses competitive advantage.
5. Import competition begins.

The introduction stage of the trade cycle begins when an innovator establishes a technological breakthrough in the production of a manufactured good. At the start, the relatively small local market for the product and technological uncertainties imply that mass production is not feasible. The manufacturer will most likely operate close to the local market to gain quick feedback on the quality and overall appeal of the product. Production occurs on a small scale using high-skilled workers. The high price of the new product will also offer high returns to the specialized capital stock needed to produce the new product.

¹⁴See Raymond Vernon, "International Investment and International Trade in the Product Life Cycle," *Quarterly Journal of Economics* 80, 1966, pp. 190–207.

During the trade cycle's next stage, the domestic manufacturer begins to export its product to foreign markets having similar tastes and income levels. The local manufacturer finds that during this stage of growth and expansion, its market becomes large enough to expand production operations and sort out inefficient production techniques. The home-country manufacturer is therefore able to supply increasing amounts to the world markets.

As the product matures and its price falls, the capability for standardized production results in the possibility that more efficient production can occur by using low-wage labor and mass production. At this stage in the product's life, it is most likely that production will move toward economies that have resource endowments relatively plentiful in low-wage labor, such as China or Malaysia. The domestic industry enters its mature stage as innovating businesses establish branches abroad and the outsourcing of jobs occurs.

Although an innovating nation's monopoly position may be prolonged by legal patents, it will most likely break down over time because in the long term, knowledge tends to be a free good. The benefits an innovating nation achieves from its technological gap are short lived, because import competition from foreign producers begins. Once the innovative technology becomes fairly commonplace, foreign producers begin to imitate the production process. The innovating nation gradually loses its comparative advantage and its export cycle enters a declining phase.

The trade cycle is complete when the production process becomes so standardized that it can be easily used by other nations. The technological breakthrough therefore no longer benefits only the innovating nation. In fact, the innovating nation may itself become a net importer of the product as its monopoly position is eliminated by foreign competition.

The product life cycle theory has implications for innovating countries such as the United States. The gains from trade for the United States are significantly determined by the dynamic balance between its rate of technological innovation and the rate of its technological diffusion to other countries. Unless the United States can generate a pace of innovation to match the pace of diffusion, its share of the gains from trade will decrease. Also, it can be argued that the advance of globalization has accelerated the rate of technological diffusion. What this advance suggests is that preserving or increasing the economy's gains from trade in the face of globalization will require acceleration in the pace of innovation in goods and service-producing activities.

The product life cycle theory also provides lessons for a firm desiring to maintain its competitiveness: To prevent rivals from catching up, it must continually innovate so as to become more efficient. Toyota Motor Corporation is generally regarded as the auto industry's leader in production efficiency. To maintain this position, the firm has continually overhauled its operations and work practices. In 2008, Toyota was working to decrease the number of components it uses in a typical vehicle by half and develop faster and more flexible plants to assemble these simplified cars. This simplification would allow workers to churn out nearly a dozen different cars on the same production line at a speed of one every 50 seconds, compared to Toyota's fastest plant that produces a vehicle every 56 seconds. The cut would increase the output per worker and reduce costs by about \$1,000 per vehicle. By pushing out the efficiency target, Toyota was attempting to prevent the latter stages of the product cycle from occurring.

Radios, Pocket Calculators, and the International Product Cycle

The experience of U.S. and Japanese radio manufacturers illustrates the product life cycle model. Following World War II, the radio was a well-established product. U.S. manufacturers dominated the international market for radios because vacuum tubes were initially developed in the United States. As production technologies spread, Japan used cheaper

labor and captured a large share of the world radio market. The transistor was then developed by U.S. companies. For a number of years, U.S. radio manufacturers were able to compete with the Japanese, who continued to use outdated technologies. Again, the Japanese imitated the U.S. technologies and were able to sell radios at more competitive prices.

Pocket calculators provide another illustration of a product that has moved through the stages of the international product cycle. This product was invented in 1961 by engineers at Sunlock Comptometer, Inc., and was marketed soon after at a price of approximately \$1,000. Sunlock's pocket calculator was more accurate than slide rules (widely used by high school and college students at that time) and more portable than large mechanical calculators and computers that performed many of the same functions.

By 1970, several U.S. and Japanese companies had entered the market with competing pocket calculators; these firms included Texas Instruments, Hewlett-Packard, and Casio (of Japan). The increased competition forced the price down to about \$400. As the 1970s progressed, additional companies entered the market. Several began to assemble their pocket calculators in foreign countries, such as Singapore and Taiwan, to take advantage of lower labor costs. These calculators were then shipped to the United States. Steadily improving technologies resulted in product improvements and falling prices; by the mid-1970s, pocket calculators sold routinely for \$10 to \$20, sometimes even less. It appears that pocket calculators had reached the standardized product stage of the product cycle by the late 1970s, with product technology available throughout the industry, price competition (and thus costs) of major significance, and product differentiation widely adopted. In a period of less than two decades, the international product cycle for pocket calculators was complete.

Japan Fades in the Electronics Industry

The essence of the product cycle theory can also be seen in the Japanese electronics industry.¹⁵ In the late 1980s, Japan seemed prepared to dominate the world's electronics market. The Japanese had seemingly formulated a superior business model where active government intervention in export-oriented industries, along with protection of Japanese firms from foreign competition, led to high growth rates and trade surpluses. Japan's achievements in electronics were notable as Sharp, Panasonic, Sony, and other Japanese firms flooded the world market with their cameras, television sets, video cassette recorders (VCRs), and the like.

The Japanese electronics industry weakened during the first decade of the 2000s, with exports declining and losses increasing. Japanese executives blamed their problems on the appreciation of the yen's exchange value, which made their products more expensive and less attractive to foreign buyers. A strong yen could not assume all of the burden for Japan's problems. According to analysts, the main source of the problem was Japanese firms' ignorance of two basic principles. First, as countries mature, their sources of comparative advantage change. Although abundant skilled labor, inexpensive capital, and price may initially be critical determinants of competitiveness, as time passes, innovation in products and production processes becomes more significant. Second, competitiveness is not just about what products to offer to the market, but also about what products not to offer.

Ignoring these principles, Japanese firms attempted to compete with upstart electronics firms like Samsung (South Korea) on the basis of inexpensive capital and manufacturing efficiency rather than product innovation. The Japanese kept producing

¹⁵Richard Katz, "What's Killing Japanese Electronics?" *The Wall Street Journal*, March 22, 2012, available at <http://online.wsj.com/>; Michael Porter, "The Five Competitive Forces That Shape Strategy," *Harvard Business Review*, January 2008, pp. 79–93; Ian King, "Micron Biggest Winner as Elpida Bankruptcy Sidelines Rival," *Bloomberg News*, February 27, 2012, available at <http://www.bloomberg.com/>.

products that were formerly profitable, such as semiconductors and consumer audio-video products that eventually lost market share to newly invented products from abroad. Also, when Japanese firms failed, their solution was mergers. Their rationale was that combining several losing firms into one would turn them into a winner as the result of economies of large-scale production. However, the merger of Japanese electronics firms could not keep pace with the rapidly changing world of digital electronics. Firms such as Intel and Texas Instruments abandoned standardized products, where price is key to competitiveness, and invented more sophisticated and profitable products, thus leapfrogging the Japanese.

Today almost four-fifths of Japan's electronics output consists of parts and components that often go into other firms' products, such as Apple's iPad. However, most of the profit goes to Apple, which invents new and popular products, rather than the firms that produce their parts. Whether its smartphones or personal computers, Japanese firms are no longer the market leaders.

Dynamic Comparative Advantage: Industrial Policy

David Ricardo's theory of comparative advantage has influenced international trade theory and policy for almost 200 years. It implies that nations are better off by promoting free trade and allowing competitive markets to determine what should be produced and how.

Ricardian theory emphasizes specialization and reallocation of existing resources found domestically. It is essentially a static theory that does not allow for a dynamic change in industries' comparative advantage or disadvantage over the course of several decades. The theory overlooks the fact that additional resources can be made available to the trading nation because they can be created or imported.

The remarkable postwar economic growth of the East Asian countries appears to be based on a modification of the static concept of comparative advantage. The Japanese were among the first to recognize that comparative advantage in a particular industry can be created through the mobilization of skilled labor, technology, and capital. They also realized that, in addition to the business sector, government can establish policies to promote opportunities for change through time. Such a process is known as **dynamic comparative advantage**. When government is actively involved in creating comparative advantage, the term **industrial policy** applies.

In its simplest form, industrial policy is a strategy to revitalize, improve, and develop an industry. Proponents maintain that government should enact policies that encourage the development of emerging, "sunrise" industries (such as high-technology). This strategy requires that resources be directed to industries in which productivity is highest, linkages to the rest of the economy are strong (as with semiconductors), and future competitiveness is important. Presumably, the domestic economy will enjoy a higher average level of productivity and will be more competitive in world markets as a result of such policies.

A variety of government policies can be used to foster the development and revitalization of industries; examples are antitrust immunity, tax incentives, research and development subsidies, loan guarantees, low-interest-rate loans, and trade protection. Creating comparative advantage requires government to identify the "winners" and encourage resources to move into industries with the highest growth prospects.

To better understand the significance of dynamic comparative advantage, we might think of it in terms of the classic example of Ricardo's theory of comparative advantage. His example showed that, in the eighteenth century, Portugal and England would each have gained by specializing respectively in the production of wine and cloth, even though Portugal might produce both cloth and wine more cheaply than England. According to

static comparative advantage theory, both nations would be better off by specializing in the product in which they had an existing comparative advantage.

However, by adhering to this prescription, Portugal would sacrifice long-run growth for short-run gains. If Portugal adopted a dynamic theory of comparative advantage instead, it would specialize in the growth industry of that time (cloth). The Portuguese government (or Portuguese textile manufacturers) would initiate policies to foster the development of its cloth industry. This strategy would require Portugal to think in terms of acquiring or creating strength in a “sunrise” sector instead of simply accepting the existing supply of resources and using that endowment as productively as possible.

Countries have used industrial policies to develop or revitalize basic industries, including steel, autos, chemicals, transportation, and other important manufactures. Each of these industrial policies differs in character and approach; common to all is an active role for government in the economy. Usually, industrial policy is a strategy developed collectively by government, business, and labor through some sort of tripartite consultation process.

Advocates of industrial policy typically cite Japan as a nation that has been highly successful in penetrating foreign markets and achieving rapid economic growth. Following World War II, the Japanese were the high-cost producers in many basic industries (such as steel). In this situation, a static notion of comparative advantage would require the Japanese to look to areas of lesser disadvantage that were more labor intensive (such as textiles). Such a strategy would have forced Japan into low-productivity industries that would eventually compete with other East Asian nations having abundant labor and modest living standards.

Instead, the Japanese invested in basic industries (steel, autos, and later electronics, including computers) that required intensive employment of capital and labor. From a short-run, static perspective, Japan appeared to pick the wrong industries. From a long-run perspective, those were the industries in which technological progress was rapid, labor productivity rose quickly, and unit costs decreased with the expansion of output. They were also industries that one would expect rapid growth in demand as national income increased.

These industries combined the potential to expand rapidly, thus adding new capacity, with the opportunity to use the latest technology and promote a strategy of cost reduction founded on increasing productivity. Japan, placed in a position similar to that of Portugal in Ricardo’s famous example, refused to specialize in “wine” and chose “cloth” instead. Within three decades, Japan became the world’s premier low-cost producer of many of the products that it initially started in a high-cost position.

Critics of industrial policy contend that the causal factor in Japanese industrial success is unclear. They admit that some of the Japanese government’s targeted industries—such as semiconductors, steel, shipbuilding, and machine tools—are probably more competitive than they would have been in the absence of government assistance. They assert that Japan also targeted some losers, such as petrochemicals and aluminum, and that the returns on investment were disappointing and capacity had to be reduced. Moreover, several successful Japanese industries did not receive government assistance—motorcycles, bicycles, paper, glass, and cement.

Industrial-policy critics contend that if all trading nations took the route of using a combination of trade restrictions on imports and subsidies on exports, a “beggar-thy-neighbor” process of trade-inhibiting protectionism would result. They also point out that the implementation of industrial policies can result in pork barrel politics, in which politically powerful industries receive government assistance. It is argued that in a free market, profit-maximizing businesses have the incentive to develop new resources and technologies that change a country’s comparative advantage. This incentive raises the question of whether the government does a better job than the private sector in creating comparative advantage.

World Trade Organization Rules That Illegal Government Subsidies Support Boeing and Airbus

An example of industrial policy is the government subsidies that apply to the commercial jetliner industry as seen in Boeing and Airbus. The world's manufacturers of commercial jetliners operate in an oligopolistic market that has been dominated by Boeing of the United States and the Airbus Company of Europe, although competition is emerging from producers in Canada, Brazil, China, and other countries. During the 1970s, Airbus sold less than 5 percent of the world's jetliners; today, it accounts for about half of the world market.

The United States has repeatedly complained that Airbus receives unfair subsidies from European governments. American officials argue that these subsidies place their company at a competitive disadvantage. Airbus allegedly receives loans for the development of new aircraft; these loans are made at below market interest rates and can amount to 70 to 90 percent of an aircraft's development cost. Rather than repaying the loans according to a prescribed timetable as typically would occur in a competitive market, Airbus can repay them after it delivers an aircraft. Airbus can avoid repaying the loans in full if sales of its aircraft fall short. Although Airbus says that has never occurred, Boeing contends that Airbus has an advantage by lowering its commercial risk, making it easier to obtain financing. The United States maintains that these subsidies allow Airbus to set unrealistically low prices, offer concessions and attractive financing terms to airlines, and write off development costs.

Airbus has defended its subsidies on the grounds that they prevent the United States from holding a worldwide monopoly in commercial jetliners. In the absence of Airbus, European airlines would have to rely exclusively on Boeing as a supplier. Fears of dependence and the loss of autonomy in an area on the cutting edge of technology motivate European governments to subsidize Airbus.

Airbus also argues that Boeing benefits from government assistance. Rather than receiving direct subsidies like Airbus, Boeing receives indirect subsidies. Governmental organizations support aeronautics and propulsion research that is shared with Boeing. Support for commercial jetliner innovation also comes from military-sponsored research and military procurement. Research financed by the armed services yields indirect but important technological spillovers to the commercial jetliner industry, most notably in aircraft engines and aircraft design. Boeing subcontracts part of the production of its jetliners to nations such as Japan and China whose producers receive substantial governmental subsidies. The state of Washington provides tax breaks to Boeing who has substantial production facilities in the state. According to Airbus, these subsidies enhance Boeing's competitiveness.

As a result of the subsidy conflict between Boeing and Airbus, the United States and Europe in 1992 negotiated an agreement to curb subsidies for the two manufacturers. The principal element of the accord was a 33 percent cap on the amount of government subsidies that these manufacturers could receive for product development. In addition, the indirect subsidies were limited to 4 percent of a firm's commercial jetliner revenue.

Although the subsidy agreement helped calm trade tensions between the United States and Europe, by the first decade of the 2000s the subsidy dispute was heating up again. The United States criticized the European Union for granting subsidies to Airbus and called for the European Union to renegotiate the 1992 subsidy deal. In 2005, Boeing and Airbus filed suits at the WTO that contended that each company was receiving illegal subsidies from the governments of Europe and the United States.

During 2010–2012, the WTO ruled that both Boeing and Airbus received illegal subsidies from their governments. The WTO determined that Airbus received about \$18 billion in illegal aid and that about \$4 billion in illegal aid was granted to Boeing. In 2017,

the WTO declared that neither government had removed the illegal subsidies granted to their plane makers. Many industry analysts predicted that the dispute would likely be settled only through trans-Atlantic negotiations. It remains to be seen how the subsidy conflict will be resolved.

Government Regulatory Policies and Comparative Advantage

Besides providing subsidies to enhance competitiveness, governments impose regulations on business to pursue goals such as workplace safety, product safety, and a clean environment. In the United States, these regulations are imposed by the Occupational Safety and Health Administration, the Consumer Product Safety Commission, and the Environmental Protection Agency. Although government regulations may improve the well-being of the public, they can result in higher costs for domestic firms. According to the American Iron and Steel Institute, U.S. steel producers today are technologically advanced, low cost, environmentally responsible, and customer focused. Yet they continue to face regulatory burdens from the U.S. government that impair their competitiveness and trade prospects.

INTERNATIONAL TRADE APPLICATION

Do Labor Unions Stifle Competitiveness?

For more than a century, labor unions have attempted to improve wages, benefits, and working conditions for their members. In the United States, unions represented about one-third of all workers in the 1950s. By 2011, unions represented only about 12 percent of the American labor force—8 percent of the labor force in the private sector and 36 percent of public sector workers. Many private sector union members belong to industrial unions, such as the United Auto Workers (UAW), which represents workers at American auto firms, tractor and earth-moving equipment firms such as Caterpillar and John Deere, and Boeing in the aerospace industry.

During the 1950s and 1960s, organized labor in the United States was generally receptive to free trade, an era when U.S. producers were strong in international markets. However, labor union leaders began to express their concerns about free trade in the 1970s as their members encountered increased competition from producers in Japan and Western Europe. Since that time, American union leaders have generally opposed efforts to liberalize trade.

Some analysts note that unions can have adverse effects on firms' competitiveness when they set wages and benefits above those of a competitive market. Unions can also impose restrictive work rules that



decrease productivity and stifle innovation. Also, union emphasis on seniority over merit in promotion and pay can hinder the incentive for worker effort. Moreover, strikes can lessen a firm's ability to maintain market share.

An influential study by Hirsch concluded that unions tend to result in compensation rising faster than productivity, diminishing profits while also lessening the ability of firms to remain price competitive. This has caused unionized companies to lose market share to nonunionized firms in domestic and international markets: Classic examples of this tendency include American auto and steel companies. Hirsch found that unions will typically raise labor costs to a firm by 15 to 20 percent, while delivering a negligible increase in productivity. Thus, the profits of unionized firms tend to be 10 to 20 percent lower than similar non-union firms. Also, the typical unionized firm has 6 percent lower capital investment than an equivalent nonunion firm, and a 15 percent lower share of spending on research and development. However, Hirsch found that the evidence does not show a higher failure rate among unionized firms.

However, other analysts contend that unions can increase the sense of worker loyalty to the firm and decrease worker turnover, thus increasing worker productivity and reducing

(continued)

costs to the firm for hiring and training. They also note that unions are a major force for greater social equality, and it is virtually impossible to have decent health care, pensions, and other worker benefits without a strong labor movement. Moreover, they note that the United States, which has a far lower rate of unionization than many other advanced countries, has consistently maintained huge trade deficits. If low rates of unionization determine trade competitiveness, shouldn't the United States be close to the top?

What do you think? In a competitive global economy, can labor unions be effective in improving the economic well-being of their members?

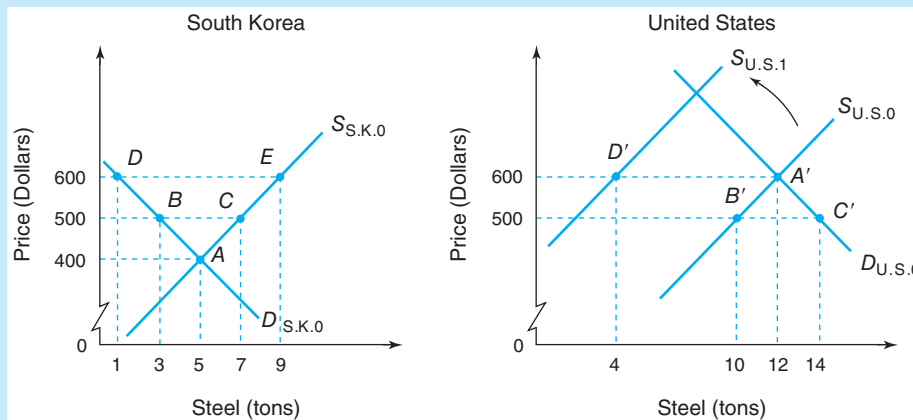
Sources: Daniel Griswold, "Unions, Protectionism, and U.S. Competitiveness," *Cato Journal*, Vol. 30, No. 1, Winter 2010, pp. 181–196. See also Barry Hirsch, "Sluggish Institutions in a Dynamic World: Can Unions and Industrial Competition Coexist?" *Journal of Economic Perspectives*, 2008, Vol. 22, No. 1; and Richard Freeman and James Medoff, *What Do Unions Do?* (New York: Basic Books, 1984).

Strict government regulations applied to the production of goods and services tend to increase costs and erode an industry's competitiveness. This is relevant for both export- and import-competing firms. Even if government regulations are justified on social welfare grounds, the adverse impact on trade competitiveness and the associated job loss have long been a cause for policy concern. Let us examine how governmental regulations on business can affect comparative advantage.

Figure 3.5 illustrates the trade effects of pollution regulations imposed on the production process. Assume a world of two steel producers, South Korea and the United States. The supply and demand schedules of South Korea and those of the United States are indicated by $S_{S,K,0}$ and $D_{S,K,0}$, and by $S_{U,S,0}$ and $D_{U,S,0}$. In the absence of trade, South Korean producers sell 5 tons of steel at \$400 per ton, while 12 tons of steel are sold in the United States at \$600 per ton. South Korea thus enjoys a comparative advantage in steel production.

FIGURE 3.5

Trade Effects of Governmental Regulations



The imposition of government regulations (clean environment, workplace safety, and product safety) on U.S. steel companies leads to higher costs and a decrease in market supply. This imposition detracts from the competitiveness of U.S. steel companies and reduces their share of the U.S. steel market.

With free trade, South Korea moves toward greater specialization in steel production, and the United States produces less steel. Under increasing-cost conditions, South Korea's

costs and prices rise, while prices and costs fall in the United States. The basis for further growth of trade is eliminated when prices in the two countries are equal at \$500 per ton. At this price, South Korea produces 7 tons, consumes 3 tons, and exports 4 tons; the United States produces 10 tons, consumes 14 tons, and imports 4 tons.

Suppose that the production of steel results in discharges into U.S. waterways, leading the Environmental Protection Agency to impose pollution regulations on domestic steel producers. Meeting these regulations adds to production costs, resulting in the U.S. supply schedule of steel shifting to $S_{U.S.1}$. The environmental regulations thus provide an additional cost advantage for South Korean steel companies. As South Korean companies expand steel production, say, to 9 tons, higher production costs result in a rise in price to \$600. At this price, South Korean consumers demand only 1 ton. The excess supply of 8 tons is earmarked for sale to the United States. As for the United States, 12 tons of steel are demanded at the price of \$600, as determined by South Korea. Given supply schedule $S_{U.S.1}$, U.S. firms now produce only 4 tons of steel at the \$600 price. The excess demand, 8 tons, is met by imports from South Korea. For U.S. steel companies, the costs imposed by pollution regulations lead to further comparative disadvantage and a smaller share of the U.S. market.

Environmental regulation thus results in a policy trade-off for the United States. By adding to the costs of domestic steel companies, environmental regulations make the United States more dependent on foreign-produced steel. However, regulations provide American households with cleaner water and air, and thus a higher quality of life. Also, the competitiveness of other American industries, such as forestry products, may benefit from cleaner air and water. These effects must be considered when forming an optimal environmental regulatory policy. The same principle applies to the regulation of work-place safety by the Occupational Safety and Health Administration and the regulation of product safety by the Consumer Product Safety Commission.

To help grow the U.S. economy and improve the competitiveness of its producers, President Donald Trump reduced the number of existing federal regulations. His deregulation targets included environmental, health, and other regulations that Trump felt were excessive and reduced the productivity of the economy.

Transportation Costs and Comparative Advantage

As discussed in Chapter 2 of this textbook, Ricardo's classic work on comparative advantage assumed that only production costs mattered. Because the costs of shipping goods did not enter Ricardo's analysis, he assumed that transportation costs were zero. However, economists now realize that, besides embodying production costs, the principle of comparative advantage includes the costs of moving goods from one nation to another.

Transportation costs refer to the costs of moving goods, including freight charges, packing and handling expenses, and insurance premiums. These costs are an obstacle to trade and impede the realization of gains from trade liberalization. Differences across countries in transport costs are a source of comparative advantage and affect the volume and composition of trade.

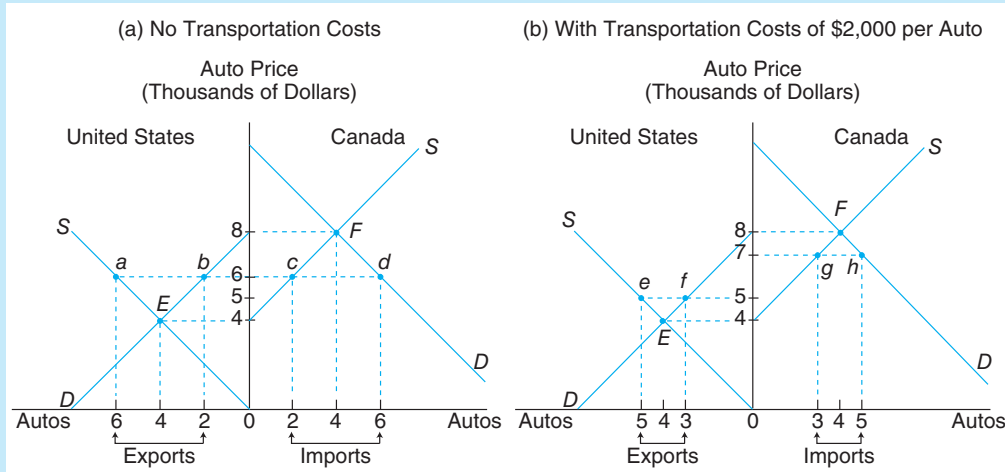
Trade Effects

The trade effects of transportation costs can be illustrated with a conventional supply and demand model based on increasing-cost conditions. Figure 3.6(a) illustrates the supply and demand curves of autos for the United States and Canada. Reflecting the assumption that the United States has the comparative advantage in auto production, the U.S. and Canadian equilibrium locations are at points *E* and *F*, respectively. In the absence of trade, the U.S. auto price, \$4,000, is lower than that of Canada, \$8,000.

When trade is allowed, the United States will move toward greater specialization in auto production, whereas Canada will produce fewer autos. Under increasing-cost conditions, the

FIGURE 3.6

Free Trade Under Increasing-Cost Conditions



In the absence of transportation costs, free trade results in the equalization of prices of traded goods, as well as resource prices, in the trading nations. With the introduction of transportation costs, the low-cost exporting nation produces less, consumes more, and exports less; the high-cost importing nation produces more, consumes less, and imports less. The degree of specialization in production between the two nations decreases, as do the gains from trade.

U.S. cost and price levels rise and Canada's price falls. The basis for further growth of trade is eliminated when the two countries' prices are equal, at \$6,000. At this price, the United States produces 6 autos, consumes 2 autos, and exports 4 autos; Canada produces 2 autos, consumes 6 autos, and imports 4 autos. Therefore, \$6,000 becomes the equilibrium price for both countries because the excess auto supply of the United States just matches the excess auto demand in Canada.

The introduction of transportation costs into the analysis modifies the conclusions of this example. Suppose the per-unit cost of transporting an auto from the United States to Canada is \$2,000, as shown in Figure 3.6(b). The United States would find it advantageous to produce autos and export them to Canada until its relative price advantage is eliminated. But when transportation costs are included in the analysis, the U.S. export price reflects domestic production costs plus the cost of transporting autos to Canada. The basis for trade thus ceases to exist when the U.S. auto price *plus* the transportation cost rises to equal Canada's auto price. This equalization occurs when the U.S. auto price rises to \$5,000 and Canada's auto price falls to \$7,000, the difference between them being the \$2,000 per-unit transportation cost. Instead of a single price ruling in both countries, there will be two domestic auto prices, differing by the cost of transportation.

Compared with free trade in the absence of transportation costs, when transportation costs are included, the high-cost importing country will produce more, consume less, and import less. The low-cost exporting country will produce less, consume more, and export less. Transportation costs, therefore, tend to reduce the volume of trade, the degree of specialization in production among the nations concerned, and thus the gains from trade.

The inclusion of transportation costs in the analysis modifies our trade model conclusions. A product will be traded internationally as long as the pre-trade price differential between the trading partners is greater than the cost of transporting the product between

them. When trade is in equilibrium, the price of the traded product in the exporting nation is less than the price in the importing country by the amount of the transportation cost.

Transportation costs also have implications for the factor-price equalization theory presented earlier in this chapter. Recall that this theory suggests that free trade tends to equalize product prices and factor prices so that all workers earn the same wage rate and all units of capital earn the same interest income in both nations. Free trade permits factor-price equalization to occur because factor inputs that cannot move to another country are implicitly being shipped in the form of products. However, looking at the real world, we see U.S. autoworkers earning more than South Korean autoworkers. One possible reason for this differential is transportation costs. By making low-cost South Korean autos more expensive for U.S. consumers, transportation costs reduce the volume of autos shipped from South Korea to the United States. This reduced trade volume stops the process of commodity- and factor-price equalization before it is complete. In other words, the prices of U.S. autos and the wages of U.S. autoworkers do not fall to the levels of those in South Korea. Transportation costs thus provide some relief to high-cost domestic workers who are producing goods subject to import competition.

The cost of shipping a product from one point to another is determined by a number of factors, including distance, weight, size, value, and the volume of trade between the two points in question. Since the 1960s, the cost of international transportation has decreased significantly relative to the value of U.S. imports. From 1965 to the first decade of the 2000s, transportation costs as a percentage of the value of all U.S. imports decreased from 10 percent to less than 4 percent. This decline in the relative cost of international transportation has made imports more competitive in U.S. markets and contributed to a higher volume of trade for the United States. Falling transportation costs have been due largely to technological improvements, including the development of large dry-bulk containers, large-scale tankers, containerization, and wide-bodied jets. Moreover, technological advances in telecommunications have reduced the economic distances among nations.¹⁶

Falling Transportation Costs Foster Trade

If merchants everywhere appear to be selling imports, there is a reason. International trade has been growing at a rapid pace. What underlies the expansion of international commerce? The worldwide decrease in trade barriers, such as tariffs and quotas, is certainly one reason. The economic opening of nations that have traditionally been minor players, such as Mexico and China, is another. But one factor behind the trade boom has largely been unnoticed: the declining costs of getting goods to the market.

Today, transportation costs are a less severe obstacle than they used to be. One reason is that the global economy has become much less transport intensive than it once was. In the early 1900s, for example, manufacturing and agriculture were the two most important industries in most nations. International trade thus emphasized raw materials, such as iron ore and wheat, or processed goods such as steel. These sorts of goods are heavy and bulky, resulting in a relatively high cost of transporting them compared with the value of the goods themselves. As a result, transportation costs had much to do with the volume of trade. Over time, however, world output has shifted into goods whose value is unrelated to their size and weight. Finished manufactured goods, not raw commodities, dominate the flow of trade. Therefore, less transportation is required for every dollar's worth of exports or imports.

¹⁶Jean-Paul Rodrigue, *Transportation, Globalization and International Trade* (New York: Routledge, 2013); Alberto Behar and Anthony Venables, "Transportation Costs and International Trade," *Handbook of Transport Economics*, Ed. Andre de Palma and others (Northampton, MA: Edward Elgar, 2010); and David Hummels, "Transportation Costs and International Trade in the Second Era of Globalization," *Journal of Economic Perspectives*, Vol. 21, No. 3, Summer 2007, pp. 131–154.

Productivity improvements for transporting goods have also resulted in falling transportation costs. In the early 1900s, the physical process of importing or exporting was difficult. Imagine a British textile firm desiring to sell its product in the United States. First, at the firm's loading dock, workers would have lifted bolts of fabric into the back of a truck. The truck would head to a port and unload its cargo, bolt by bolt, into a dockside warehouse. As a vessel prepared to set sail, dockworkers would remove the bolts from the warehouse and hoist them into the hold, where other dockworkers would stow them in place. When the cargo reached the United States, the process would be reversed. Indeed, this sort of shipment was a complicated task, requiring much effort and expense. With the passage of time came technological improvements such as modern ocean liners, standard containers for shipping goods, computerized loading ports, and freight companies such as United Parcel Service and Federal Express that specialize in using a combination of aircraft and trucks to deliver freight quickly. These and other factors have resulted in falling transportation costs and increased trade among nations.

Recent decades have witnessed a growth in world trade that was supported by decreases in transportation costs and trade barriers. However, when oil prices surged in 2008 and 2011, rising transport costs became an increasing challenge to world trade. For example, economists estimated that transportation costs were the equivalent of a 10–11 percent tariff on goods coming into U.S. ports when the price of a barrel of oil rose to \$145 in 2008. This is compared with the equivalent of only 3 percent when oil was selling for \$20 a barrel in 2000.

Rising shipping costs suggest that trade should be both dampened and diverted as markets look for shorter, and thus, less costly transportation routes. As transportation costs rise, markets tend to substitute goods that are from closer locations rather than from locations halfway around the world carrying hugely inflated shipping costs. For example, Emerson Electric Co., a St. Louis-based manufacturer of appliance motors and other electrical equipment, shifted some of its production from Asia to Mexico and the United States in 2008, in part to offset increasing transportation costs by being closer to customers in North America.

How Containers Revolutionized the World of Shipping

Shipping containers are everywhere, millions of them. They are made of aluminum or steel, come in lengths of 10 feet, 20 feet, or 40 feet, and travel across the nation on trains and trucks. And they are placed on huge ships to be unloaded and reloaded in record times at port terminals throughout the world. The advent of the shipping container revolutionized the world of shipping. How did this occur?

Prior to the 1960s, moving goods by ship was a very complicated and costly endeavor, involving millions of people who drove, dragged, or pushed cargo through city streets to or from the piers. Docks were cluttered with a multitude of goods. The process of loading and unloading a ship often took weeks and accounted for between 60 and 75 percent of shipping costs. And, given the difficulties inherent and time involved in moving goods housed in a variety of different containers, it was necessary that factories locate close to docks for fast access to raw materials. Simply put, the loading and unloading of ships was conducted in much the same way the ancient Phoenicians did it 3,000 years ago.

During the late 1950s, businessman Malcom McLean founded the Sea-Land Shipping Company, the first American transportation company to specialize in containerization. McLean had a wonderful idea: Instead of packing everything into a ship, unpacking it, sorting it, putting the various items on a truck or a train and unpacking them again, why not put everything into a container. McLean envisioned a highly efficient transportation system where goods could be placed in one container and shipped around the world without ever being handled, merely placing the same container on a ship, a train, and a truck.

Did McLean's transportation system work? In 1956 it cost about \$5.90 a ton to hand-load a cargo ship. Using containers, it cost only 16 cents a ton to load a ship, a 37-fold savings, in the early 1960s.

In 1963, McLean opened a new port facility in Newark, New Jersey to handle container traffic. However, the development of the container market was slow until the late 1960s. Many ports did not have the cranes to lift containers on and off ships, and change was slow to come to an industry steeped in tradition. Also, unions resisted a new technology that appeared to threaten the jobs of their members. These hurdles eventually dwindled and containerization became the standard of the shipping industry of the United States and throughout the world.

McLean's idea of shipping containers changed the nature of where things are made and how countries trade as it drove down the cost of international shipping, enhanced reliability, reduced pilferage and theft, and slashed insurance rates. Containerization has been responsible for an increase in the volume of trade, the creation of just-in-time supply and manufacturing chains, and a decrease in the price of consumer goods. Moreover, containerization reduced the need for manufacturers to be close to ports. It drove some older ports out of existence and created an enormous demand for technologically efficient ports, like the Port of New York. If you happen to travel to, say, New York, Los Angeles, Houston, or Seattle, visit the port and watch the containers being unloaded from docked ships. We owe a lot to Malcom McLean.¹⁷

The Port of Prince Rupert: Shifting Competitiveness in Shipping Routes

Have you ever been to Prince Rupert, Canada? If not, head north of Seattle, Washington, about 1,000 miles, and there you will find this scenic community of 15,000 people in western British Columbia. By 2015, Prince Rupert had become a major North American entry point for Asian-manufactured goods. About 90 percent of the containers received in Prince Rupert are transported by rail and truck to the United States.

Shipping companies seek the fastest and least costly routes to transport Asian products to the United States. However, shippers have sometimes encountered difficulties in dealing with U.S. ports due to congestion, labor conflicts, and tax concerns. For example, the U.S. government imposes a federal harbor-maintenance tax, which costs shippers anywhere from \$25 to \$500 per container. Also, the International Longshoremen and Warehouse Union has sometimes been accused of worker slowdowns, designed to pressure port authorities during negotiations for higher wages for its members. The slowdowns have contributed to cargo backlogs at ports like Seattle, Tacoma, and Oakland, according to port authorities. However, International Longshoremen and Warehouse Union officials maintain that the safety of its workers is the reason for slowing down the shipment of goods.

Moreover, Canada's Pacific Coast ports have a natural geographic advantage—relative proximity. For example, Prince Rupert is the closest North American port to Asia because of the earth's curvature; it is almost three days closer to China by boat than Los Angeles. Another advantage is that Prince Rupert has one of the world's deepest natural ice-free harbors. Therefore, the Canadian government has spent large sums to improve rail and road

¹⁷Marc Levinson, *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger*, Princeton University Press, Princeton, NJ, 2006; Craig Martin, *Shipping Container*, Bloomsburg Publishing Co., New York, 2016; and World Shipping Council, *Container Shipping in Ten Steps*, 2016, available at www.worldshipping.org.

access and enhance border inspection capacity at its West Coast ports, making it easier for U.S.-bound products to enter Canada. Also, the Canadian National Railway Co. has invested billions to reduce travel times to the United States along its western corridor.

With five world-class terminals, including the fastest-growing container terminal in North America, and ample industrial land ready for development, the Port of Prince Rupert has grown Canada's trade with Asia's economies. Indeed, competition from Canada's Pacific Coast ports has been noticed by ports in the United States. They realize that, once a port loses business, it is difficult to get it back.

This was the case in 2014–2015 when a labor dispute caused months of gridlock at West Coast ports in the United States. As companies were unable to ship their goods via these ports, they increasingly shifted to cargo ports on America's East Coast and Gulf Coast and to ports in western Canada and Mexico in an attempt to avoid growing congestion resulting from unsuccessful labor talks between union workers and port officials. This was bad news for West Coast ports, truckers, and railroads.¹⁸

SUMMARY

1. The immediate basis for trade stems from relative product price differences among nations. Because relative prices are determined by supply and demand conditions, such factors as resource endowments, technology, and national income are ultimate determinants of the basis for trade.
2. The factor-endowment theory suggests that differences in relative factor endowments among nations underlie the basis for trade. The theory asserts that a nation will export that product in the production of which a relatively large amount of its abundant and cheap resource is used. Conversely, it will import commodities in the production of which a relatively scarce and expensive resource is used. The theory also states that with trade, the relative differences in resource prices between nations tend to be eliminated.
3. According to the Stolper–Samuelson theorem, increases in income occur for the abundant resource that is used to determine comparative advantage. Conversely, the scarce factor realizes a decrease in income.
4. The specific-factors theory analyzes the income distribution effects of trade in the short run when resources are immobile among industries. It concludes that resources specific to export industries tend to gain as a result of trade.
5. Contrary to the predictions of the factor-endowment model, the empirical tests of Wassily Leontief demonstrated that, for the United States, exports are labor intensive and import-competing goods are capital intensive. His findings became known as the Leontief paradox.
6. By widening the size of the domestic market, international trade permits firms to take advantage of longer production runs and increasing efficiencies (such as mass production). Such economies of scale can be translated into lower product prices, which improve a firm's competitiveness.
7. Staffan Linder offers two explanations for world trade patterns. Trade in primary products and agricultural goods conforms well to the factor-endowment theory. But trade in manufactured goods is best explained by overlapping demand structures among nations. For manufactured goods, the basis for trade is stronger when the structure of demand in the two nations is more similar—that is, when the nations' per capita incomes are similar.

¹⁸Laura Stevens and Paul Ziobro, "Ports Gridlock Reshapes the Supply Chain," *The Wall Street Journal*, March 6, 2015; David George-Cosh, "Fastest Asia-U.S. Shipping Route? Canada's Ports," *The Wall Street Journal*, December 11, 2014; and Sara Aitchison, "Port Labor Dispute: Both Sides Must Improve Intervention, Union Members Not Convinced," *Puget Sound Business Journal*, November 11, 2014.

8. Besides inter-industry trade, the exchange of goods among nations includes intra-industry trade—two-way trade in a similar product. Intra-industry trade occurs in homogeneous goods as well as in differentiated products.
9. One dynamic theory of international trade is the product life cycle theory. This theory views a variety of manufactured goods as going through a trade cycle, during which a nation initially is an exporter, then loses its export markets, and finally becomes an importer of the product. Empirical studies have demonstrated that trade cycles do exist for manufactured goods at some times.
10. Dynamic comparative advantage refers to the creation of comparative advantage through the mobilization of skilled labor, technology, and capital; it can be initiated by either the private or public sector. When government attempts to create comparative advantage, the term *industrial policy* applies. Industrial policy seeks to encourage the development of emerging, sunrise industries through such measures as tax incentives and research and development subsidies.
11. Business regulations can affect the competitive position of industries. These regulations often result in cost-increasing compliance measures, such as the installation of pollution control equipment, which can detract from the competitiveness of domestic industries.
12. International trade includes the flow of services between countries as well as the exchange of manufactured goods. As with trade in manufactured goods, the principle of comparative advantage applies to trade in services.
13. Transportation costs tend to reduce the volume of international trade by increasing the prices of traded goods. A product will be traded only if the cost of transporting it between nations is less than the pre-trade difference between their relative commodity prices.

KEY CONCEPTS AND TERMS

Capital/labor ratio (p. 72)	Home market effect (p. 91)	Magnification effect (p. 82)
Dynamic comparative advantage (p. 100)	Industrial policy (p. 100)	Product life cycle theory (p. 97)
Economies of scale (p. 90)	Inter-industry specialization (p. 94)	Specific factors (p. 85)
External economies of scale (p. 92)	Inter-industry trade (p. 94)	Specific-factors theory (p. 85)
Factor-endowment theory (p. 72)	Internal economies of scale (p. 90)	Stolper–Samuelson theorem (p. 82)
Factor-price equalization (p. 79)	Intra-industry specialization (p. 95)	Theory of overlapping demands (p. 93)
Heckscher–Ohlin theory (p. 72)	Intra-industry trade (p. 95)	Transportation costs (p. 105)
	Leontief paradox (p. 89)	

STUDY QUESTIONS

1. What are the effects of transportation costs on international trade patterns?
2. Explain how the international movement of products and of factor inputs promotes an equalization of the factor prices among nations.
3. How does the factor-endowment theory differ from Ricardian theory in explaining international trade patterns?
4. The factor-endowment theory demonstrates how trade affects the distribution of income within trading partners. Explain.
5. How does the Leontief paradox challenge the overall applicability of the factor-endowment model?
6. According to Staffan Linder, there are two explanations for international trade patterns—one for manufactured goods and another for primary (agricultural) goods. Explain.
7. Do recent world trade statistics support or refute the notion of a product life cycle for manufactured goods?
8. How can economies of scale affect world trade patterns?
9. Distinguish between intra-industry trade and inter-industry trade. What are some major determinants of intra-industry trade?
10. What is meant by the term *industrial policy*? How do governments attempt to create comparative

advantage in sunrise sectors of the economy? What are some problems encountered when attempting to implement industrial policy?

11. How can governmental regulatory policies affect an industry's international competitiveness?
12. International trade in services is determined by what factors?
13. Table 3.6 illustrates the supply and demand schedules for calculators in Sweden and Norway. On graph paper, draw the supply and demand schedules of each country.
 - a. In the absence of trade, what are the equilibrium price and quantity of calculators produced in Sweden and Norway? Which country has the comparative advantage in calculators?
 - b. Assume there are no transportation costs. With trade, what price brings about balance in exports and imports? How many calculators are traded at this price? How many calculators are produced and consumed in each country with trade?
 - c. Suppose the cost of transporting each calculator from Sweden to Norway is \$5. With trade, what is the impact of the transportation cost on the price of calculators in Sweden and Norway? How many calculators will each country produce, consume, and trade?
14. In general, what can be concluded about the impact of transportation costs on the price of the traded product in each trading nation? The extent of specialization? The volume of trade?

TABLE 3.6**Supply and Demand Schedules for Calculators**

SWEDEN			NORWAY		
Price	Quantity Supplied	Quantity Demanded	Price	Quantity Supplied	Quantity Demanded
\$0	0	1,200	\$0	–	1,800
5	200	1,000	5	–	1,600
10	400	800	10	–	1,400
15	600	600	15	0	1,200
20	800	400	20	200	1,000
25	1,000	200	25	400	800
30	1,200	0	30	600	600
35	1,400	–	35	800	400
40	1,600	–	40	1,000	200
45	1,800	–	45	1,200	0

EXPLORING FURTHER

For a more detailed presentation of the specific-factors theory, go to *Exploring Further 3.1*, which can be found in **MindTap**.

CHAPTER 4

Tariffs



According to the free trade argument, open markets based on comparative advantage and specialization result in the most efficient use of world resources. Not only do free trade and specialization enhance world welfare, but they can also benefit each participating nation. Every nation can overcome the limitations of its own productive capacity to consume a combination of goods that exceeds the best it can produce in isolation.

However, free trade policies often meet resistance among those companies and workers who face losses in income and jobs because of import competition. Policymakers are thus torn between the appeal of greater global efficiency in the long run made possible by free trade and the needs of the voting public whose main desire is to preserve short-run interests such as employment and income. The benefits of free trade may take years to achieve and are spread over wide segments of society, whereas the costs of free trade are immediate and fall on specific groups such as workers in an import-competing industry.

When forming an international trade policy, a government must decide where to locate along the spectrum between autarky (closed market) and free trade (open market). As a government protects its producers from foreign competition, it encourages its economy to move closer to a state of isolationism, or autarky. Nations like Cuba and North Korea have traditionally been highly closed economies and therefore are closer to autarky. Conversely, if a government does not regulate the exchange of goods and services between nations, it moves to a free trade policy. Countries such as Hong Kong (now part of the People's Republic of China) and Singapore are largely free trade countries. The remaining countries of the world lie somewhere between these extremes. Rather than considering which of these two extremes a government should pursue, policy discussions generally consider where along this spectrum a country should locate—that is, “how much” trade liberalization or protectionism to pursue.

This chapter considers barriers to trade. In particular, it focuses on the role that tariffs play in the global trading system.

The Tariff Concept

A **tariff** is simply a tax levied on a product when it crosses national boundaries. The most widespread tariff is the *import tariff*, which is a tax levied on an imported product. This tax is collected before the shipment can be unloaded at a domestic port; the collected money is called a customs duty. A less common tariff is an *export tariff*, which is a tax imposed on an exported product. Export tariffs have often been used by developing nations. Cocoa exports have been taxed by Ghana, and oil exports have been taxed by the Organization of Petroleum Exporting Countries (OPEC) in order to raise revenue or promote scarcity in global markets and hence increase the world price.

Did you know that the United States cannot levy export tariffs? When the U.S. Constitution was written, southern cotton-producing states feared that northern textile manufacturing states would pressure the federal government into levying export tariffs to depress the price of cotton. An export duty would lead to decreased exports and a fall in the price of cotton within the United States. As the result of negotiations, the Constitution was worded to prevent export taxes: “No tax or duty shall be laid on articles exported from any state.”

Tariffs may be imposed for protection or revenue purposes. A **protective tariff** is designed to reduce the amount of imports entering a country, thus insulating import-competing producers from foreign competition. This tariff allows an increase in the output of import-competing producers that would not have been possible without protection. A **revenue tariff** is imposed for the purpose of generating tax revenues and may be placed on either exports or imports.

Over time, tariff revenues have decreased as a source of government revenue for advanced nations, including the United States. In 1900, tariff revenues constituted more than 41 percent of U.S. government receipts; in 2013, the figure stood at about 1.0 percent. However, many developing nations currently rely on tariffs as a sizable source of government revenue. Table 4.1 shows the percentage of government revenue that several selected nations derive from tariffs.

Some tariffs vary according to the time of entry into the United States, as occurs with agricultural goods such as grapes, grapefruit, and cauliflower. This tariff reflects the harvest season for these products. When these products are out of season in the United States, the tariff is low. Higher tariffs are imposed when U.S. production in these goods increases during harvest season.

TABLE 4.1

Taxes on International Trade as a Percentage of Government Revenues, 2013: Selected Countries

Developing Countries	Percentage	Advanced Countries	Percentage
Bahamas	43.2	New Zealand	2.7
Ethopia	29.8	Australia	1.8
Liberia	28.1	Japan	1.7
Bangladesh	26.7	United States	1.2
Grenada	25.4	Switzerland	1.0
Russian Federation	25.8	Norway	0.3
Philippines	19.9	Ireland	0.2
India	14.1	World average	3.8

Source: From *World Bank Data* at <http://data.worldbank.org>. See also International Monetary Fund, *Government Finance Statistics, Yearbook*, Washington, DC.

Not all goods that enter the United States are subject to tariffs. In 2015, only about 30 percent of U.S. imports were dutiable (subject to import duties), whereas 70 percent of imports were free of tariffs. That U.S. imports are duty free is mainly because of free trade agreements that the United States reaches with other countries (North American Free Trade Agreement) and trade preferences that the United States gives to imports from developing countries (Generalized System of Preferences program). Also, a sizable portion of most-favored-nation (MFN) tariffs are duty free. These topics are discussed in Chapters 6, 7, and 8 of this textbook.

Types of Tariffs

Tariffs can be specific, *ad valorem*, or compound. A **specific tariff** is expressed in terms of a fixed amount of money per physical unit of the imported product. A U.S. importer of a German computer may be required to pay a duty to the U.S. government of \$100 per computer, regardless of the computer's price. Therefore, if 100 computers are imported, the tariff revenue of the government equals \$10,000 inequality.

An **ad valorem (of value) tariff**, much like a sales tax, is expressed as a fixed percentage of the value of the imported product. Suppose that an ad valorem duty of 2.5 percent is levied on imported automobiles. If \$100,000 worth of autos are imported, the government collects \$2,500 in tariff revenue ($\$100,000 \times 2.5\% = \$2,500$). This \$2,500 is collected whether 5 \$20,000 Toyotas are imported or 10 \$10,000 Nissans are imported. Most of the tariffs levied by the U.S. government are ad valorem tariffs.

A **compound tariff** is a combination of specific and ad valorem tariffs. A U.S. importer of a television might be required to pay a duty of \$20 plus 5 percent of the value of the television. Table 4.2 lists U.S. tariffs on certain items.

What are the relative merits of specific, ad valorem, and compound tariffs?

TABLE 4.2

Selected U.S. Tariffs

Product	Duty Rate
Brooms	\$0.32 each
Fishing reels	\$0.24 each
Wrist watches (without jewels)	\$0.29 each
Ball bearings	2.4% ad valorem
Electrical motors	6.7% ad valorem
Bicycles	5.5% ad valorem
Wool blankets	\$0.18/kg + 6% ad valorem
Electricity meters	\$0.16 each + 1.5% ad valorem
Auto transmission shafts	\$0.25 each + 3.9% ad valorem

Source: From U.S. International Trade Commission, *Tariff Schedules of the United States*, Washington, DC, Government Printing Office, 2016, available at <http://www.usitc.gov/tata/index.htm>.

Specific Tariff

As a fixed monetary duty per unit of the imported product, a specific tariff is relatively easy to apply and administer, particularly to standardized commodities and staple products

where the value of the dutiable goods cannot be easily observed. A main disadvantage of a specific tariff is that the degree of protection it affords domestic producers varies inversely with changes in import prices. A specific tariff of \$1,000 on autos will discourage imports priced at \$20,000 per auto to a greater degree than those priced at \$25,000. During times of rising import prices, a given specific tariff loses some of its protective effect. The result is to encourage domestic producers to produce less expensive goods, for which the degree of protection against imports is higher. On the other hand, a specific tariff has the advantage of providing domestic producers more protection during a business recession, when cheaper products are purchased. Specific tariffs thus cushion domestic producers progressively against foreign competitors who cut their prices.

Ad Valorem Tariff

Ad valorem tariffs usually lend themselves more satisfactorily to manufactured goods because they can be applied to products with a wide range of grade variations. As a percentage applied to a product's value, an ad valorem tariff can distinguish among small differentials in product quality to the extent that they are reflected in product price. Under a system of ad valorem tariffs, a person importing a \$20,000 Honda would have to pay a higher duty than a person importing a \$19,900 Toyota. Under a system of specific tariffs, the duty would be the same.

Another advantage of an ad valorem tariff is that it tends to maintain a constant degree of protection for domestic producers during periods of changing prices. If the tariff rate is a 20 percent ad valorem and the imported product price is \$200, the duty is \$40. If the product's price increases to \$300, the duty collected rises to \$60; if the product price falls to \$100, the duty drops to \$20. An ad valorem tariff yields revenues proportionate to values, maintaining a constant degree of relative protection at all price levels. An ad valorem tariff is similar to a proportional tax in that the real proportional tax burden or protection does not change as the tax base changes. In recent decades, in response to global inflation and the rising importance of world trade in manufactured products, ad valorem duties have been used more often than specific duties.

The determination of duties under the ad valorem principle at first appears to be simple, but in practice it has suffered from administrative complexities. The main problem has been trying to determine the value of an imported product, a process referred to as **customs valuation**. Import prices are estimated by customs appraisers who may disagree on product values. Moreover, import prices tend to fluctuate over time, making the valuation process rather difficult.

Another customs-valuation problem stems from variations in the methods used to determine a commodity's value. For example, the United States has traditionally used **free-on-board (FOB) valuation**, whereby the tariff is applied to a product's value as it leaves the exporting country. But European countries have traditionally used a **cost-insurance-freight (CIF) valuation**, whereby ad valorem tariffs are levied as a percentage of the imported commodity's total value as it arrives at its final destination. The CIF price thus includes transportation costs, such as insurance and freight.

Compound Tariff

Compound duties are often applied to manufactured products embodying raw materials that are subject to tariffs. In this case, the specific portion of the duty neutralizes the cost disadvantage of domestic manufactures that results from tariff protection granted to domestic suppliers of raw materials, and the ad valorem portion of the duty grants protection to the finished-goods industry. In the United States, there is a compound duty on woven fabrics (\$0.485 per kilogram plus 38 percent). The specific portion of the duty (\$0.485) compensates

U.S. fabric manufacturers for the tariff protection granted to U.S. cotton producers, while the ad valorem portion of the duty (38 percent) provides protection for their own woven fabrics.

How high are import tariffs around the world? Table 4.3 provides examples of tariffs of selected countries.

TABLE 4.3**Average Import Tariff Rates* for Selected Countries, 2013 (in percentages)**

Country	Average Tariff Rate
Bahamas	28.1
Argentina	12.2
China	7.8
Canada	3.2
United States	2.7
Japan	2.4
Germany	1.6
Finland	1.6

*Tariff rate, applied simple mean, all products.

Source: From *World Bank Data* at <http://data.worldbank.org>.

INTERNATIONAL TRADE APPLICATION**Trade Protectionism Intensifies as Global Economy Falls into the Great Recession**

Global economic downturns can be catalysts for trade protectionism. As economies shrink, nations have incentive to protect their struggling producers by establishing barriers against imported goods. Consider the Great Recession of 2007–2009.

As the global economy fell into recession, a decrease in the demand for goods and services, and thus a decline in international trade, occurred. Exports declined by 30 percent or more for countries as diverse as Indonesia, France, South Africa, and the Philippines. Increasingly, firms and workers worried about the harm that was inflicted on them by their foreign competitors who were seeking customers around the globe. China was the country targeted by the most governments for protectionist measures.

Although leaders of the Group of 20 large economies unanimously pledged not to resort to protectionism in 2008 and 2009, virtually all of them slipped at least a little bit. Russia increased tariffs on imported automobiles, India raised tariffs on steel imports, and Argentina established new obstacles to imported auto parts and shoes. Also, in 2009 the United States imposed tariffs of between 25 and 35 percent on imports of tires from China for the

next three years. This policy essentially priced out of the market 17 percent of all tires sold in the United States and forced up the market price for consumers.

During the Great Depression of the 1930s, countries raised import tariffs to protect producers damaged by foreign competition. The United States increased import tariffs on some 20,000 goods that provoked widespread retaliation from its trading partners. Such tariff increases contributed to the volume of world trade shrinking by a quarter. A lesson from this era is that once trade barriers are increased, they can severely damage global supply chains. It can take years of negotiation to dismantle trade barriers and years before global supply chains can be restored. Despite this lesson, governments have continued to adopt protectionist policies as their economies slide into recession.

What do you think? Concerning international trade policy, why do countries sometimes become more protectionist as their economies fall into recession?

Source: Chairman of the Council of Economic Advisors, *Economic Report of the President*, 2010.



Effective Rate of Protection

In our previous discussion of tariffs, we assumed that a given product is produced entirely in one country. For example, a desktop computer produced by Dell (a U.S. firm) could be the output that results from using only American labor and components. However, this ignores the possibility that Dell imports some parts used in producing desktops, such as memory chips, hard-disk drives, and microprocessors.

When some inputs used in producing finished desktops are imported, the amount of protection given to Dell depends not only on the tariff rate applied to desktops, but also on whether there are tariffs on inputs used to produce them. The main point is that when Dell imports some of the inputs required to produce desktops, the tariff rate on desktops may not accurately indicate the protection being provided to Dell.

In analyzing tariffs, economists distinguish between the nominal tariff rate and the effective tariff rate. The **nominal tariff rate** is the rate that is published in the country's tariff schedule. This rate applies to the value of a *finished product* that is imported into a country. The **effective tariff rate** takes into account not only the nominal tariff rate on a finished product, but also any tariff rate applied to *imported inputs* that are used in producing the finished product.¹

If a finished desktop enters the United States at a zero tariff rate, while imported components used in desktop production are taxed, then Dell is taxed instead of protected. A nominal tariff on a desktop protects the production of Dell, while a tariff on imported components taxes Dell by increasing its costs. The effective tariff rate recognizes these two effects.

The effective tariff rate refers to the level of protection being provided to Dell by a nominal tariff on desktops and the tariff on inputs used in desktop production. Specifically, it measures the percentage increase in domestic production activities (value added) per unit of output made possible by tariffs on both the finished desktop and on imported inputs. A given tariff on a finished desktop will have a greater protective effect if it is combined with a low tariff on imported inputs than if the tariff on imported inputs is high.

To illustrate this principle, assume Dell adds value by assembling computer components that are produced abroad. Suppose the imported components can enter the United States on a duty free basis (zero tariff). Suppose also that 20 percent of a desktop's final value can be attributed to domestic assembly activities (value added). The remaining 80 percent reflects the value of the imported components. Let the cost of the desktop's components be the same for both Dell and its foreign competitor, say, Sony Inc. of Japan. Assume that Sony can produce and sell a desktop for \$500.

Suppose the United States imposes a nominal tariff of 10 percent on desktops, so that the domestic import price rises from \$500 to \$550 per unit, as seen in Table 4.4. Does this mean that Dell realizes an effective rate of protection equal to 10 percent? Certainly not! The imported components enter the country duty free (at a nominal tariff rate less than that on the finished desktop), so the effective rate of protection is 50 percent. Compared with what would exist under free trade, Dell can incur 50 percent more production activities and still be competitive.

Table 4.4 shows the figures in detail. Referring to Table 4.4(a), under free trade (zero tariff), a Sony desktop could be imported for \$500. To meet this price, Dell would have to hold its assembly costs to \$100. Referring to Table 4.4(b), under the protective umbrella of the tariff, Dell can incur up to \$150 of assembly costs and still meet the \$550 price of imported desktops. The result is that Dell's assembly costs could rise to a level of 50 percent above what would exist under free trade conditions: $(\$150 - \$100)/\$100 = 0.5$.

¹The effective tariff is a measure that applies to a single nation. In a world of floating exchange rates, if all nominal or effective tariff rates rose, the effect would be offset by a change in the exchange rate.

TABLE 4.4

The Effective Rate of Protection

(a) Free Trade: No Tariff on Imported Sony Desktops

SONY'S DESKTOP	COST	DELL'S DESKTOP	COST
Component parts	\$400	Imported component parts	\$400
Assembly activity (value added)	<u>100</u>	Assembly activity (value added)	<u>100</u>
Import price	\$500	Domestic price	\$500

(b) 10 Percent Tariff on Imported Sony Desktops

SONY'S DESKTOP	COST	DELL'S DESKTOP	COST
Component parts	\$400	Imported component parts	\$400
Assembly activity (value added)	100	Assembly activity (value added)	<u>150</u>
Nominal tariff	<u>50</u>	Domestic price	\$550
Import price	\$550		

In general, the effective tariff rate is given by the following formula:

$$e = \frac{(n - ab)}{(1 - a)}$$

where

e = The effective rate of protection

n = The nominal tariff rate on the final product

a = The ratio of the value of the imported input to the value of the finished product

b = The nominal tariff rate on the imported input

When the values from the desktop example are plugged into this formula, we obtain the following:

$$e = \frac{(0.1) - 0.8(0)}{1 - 0.8} = 0.5 \text{ or } 50 \text{ percent}$$

The nominal tariff rate of 10 percent levied on the finished desktop thus allows a 50 percent increase in domestic production activities—five times the nominal rate.

However, a tariff on imported desktop components reduces the level of effective protection for Dell. This reduction means that in the above formula, the higher the value of b , the lower the effective protection rate for any given nominal tariff on the finished desktop. Suppose that imported desktop components are subject to a tariff rate of 5 percent. The effective rate of protection would equal 30 percent:

$$e = \frac{(0.1) - 0.8(0.05)}{1 - 0.8} = 0.3 \text{ or } 30 \text{ percent}$$

This is less than the 50 percent effective rate of protection that occurs when there is no tariff on imported components.

From these examples, we can draw several conclusions. When the tariff on the finished product exceeds the tariff on the imported input, the effective rate of protection exceeds the nominal tariff. If the tariff on the finished product is less than the tariff on the imported

input, the effective rate of protection is less than the nominal tariff and may even be negative. Such a situation might occur if the home government desired to protect domestic suppliers of raw materials more than domestic manufacturers.² Because national governments generally admit raw materials and other inputs either duty free or at a lower rate than finished goods, effective tariff rates are usually higher than nominal rates.

Tariff Escalation

When analyzing the tariff structures of nations, we often see that processed goods face higher import tariffs than those levied on basic raw materials. Logs may be imported tariff free while processed goods such as plywood, veneers, and furniture face higher import tariffs. The purpose of this tariff strategy is to protect, say, the domestic plywood industry by enabling it to import logs (used to produce plywood) tariff free or at low rates while maintaining higher tariffs on imported plywood that competes against domestic plywood.

This policy is referred to as **tariff escalation**: Although raw materials are often imported at zero or low tariff rates, the nominal and effective protection increases at each stage of production. As seen in Table 4.5, tariffs often rise significantly with the level of processing in many countries. This is especially true for agricultural products.

The tariff structures of the industrialized nations may indeed discourage the growth of processing, hampering diversification into higher value-added exports for the less developed nations. The industrialized nations' low tariffs on primary commodities encourage the developing nations to expand operations in these sectors, while the high protective rates levied on manufactured goods pose a significant entry barrier for any developing nation

TABLE 4.5

Tariff Escalations in Advanced and Developing Countries, 2012

Country	AGRICULTURAL PRODUCTS		INDUSTRIAL PRODUCTS	
	Primary Products	Processed Products	Primary Products	Processed Products
Bangladesh	17.5	23.0	9.1	15.4
Uganda	17.5	20.3	4.2	11.7
Argentina	5.7	11.5	2.9	9.5
Brazil	6.5	12.1	4.2	10.7
Russia	6.9	9.2	5.3	9.5
United States	1.0	2.8	1.3	2.8
Japan	4.5	10.9	0.5	1.9
World	12.0	15.1	5.6	7.7

Source: From *World Bank Data* at <http://data.worldbank.org>.

²Besides depending on the tariff rates on finished desktops and components used to produce them, the effective rate of protection depends on the ratio of the value of the imported input to the value of the finished product. The degree of effective protection for Dell increases as the value added by Dell declines (the ratio of the value of the imported input to the value of the final product increases). That is, the higher the value of a in the formula, the greater the effective protection rate for any given nominal tariff rate on desktops.

wishing to compete in this area. From the point of view of less developed nations, it may be in their best interest to discourage disproportionate tariff reductions on raw materials. The effect of these tariff reductions is to magnify the discrepancy between the nominal and effective tariffs of the industrialized nations, worsening the potential competitive position of the less developed nations in the manufacturing and processing sectors.

Outsourcing and Offshore Assembly Provision

Outsourcing is a key aspect of the global economy. Electronic components made in the United States are shipped to another country with low labor costs such as Singapore, for assembly into television sets. The assembled sets are then returned to the United States for further processing or packaging and distribution. This type of production sharing has evolved into an important competitive strategy for producers who locate each stage of production in the country where it can be accomplished at the lowest cost.

The Tariff Act of 1930 created an **offshore assembly provision (OAP)** that provides favorable treatment for products assembled abroad from U.S.-made components. Under OAP, when U.S.-made components are sent abroad and assembled to become a finished good, the cost of the U.S.-made components is not included in the dutiable value of the imported assembled good into which it has been incorporated. American import duties thus apply only to the *value added in the foreign assembly process*, provided that the U.S.-manufactured components are used in assembly operations. Manufactured goods entering the United States under OAP have included motor vehicles, office machines, television sets, aluminum cans, semiconductors, and the like. These products have represented about 8–10 percent of total U.S. imports in recent years.

The OAP pertains to both American and foreign companies. A U.S. computer company could produce components in the United States, send them to Taiwan for assembly, and ship finished computers back to the United States under favorable OAP. Alternatively, a Japanese photocopier firm desiring to export to the United States could purchase U.S.-made components, assemble them in Japan, and ship finished photocopiers to the United States under favorable OAP. One of the effects of OAP is to reduce the effective rate of protection of foreign assembly activity and shift demand from domestic to foreign assembly, as explained below.

Suppose that ABC Electronics Co. is located in the United States and manufactures television sets worth \$300 each. Included in a set are components worth \$200 that are produced by the firm in the United States. To reduce labor costs, the firm sends these components to its subsidiary in South Korea where relatively low-wage Korean workers assemble the components, resulting in finished television sets. Assume that Korean assembly is valued at \$100 per set. After being assembled in South Korea, the finished sets are imported into the United States for sale to American consumers. What will the tariff duty be on these sets?

In the absence of the OAP, the full value of each set, \$300, is subject to the tariff. If the tariff rate on such televisions is 10 percent, a duty of \$30 would be paid on each set entering the United States, and the price to the U.S. consumer would be \$330.³ Under OAP, however, the 10 percent tariff rate is levied on the value of the imported set *minus* the value of the U.S. components used in manufacturing the set. When the set enters the United States, its dutiable value is thus $\$300 - \$200 = \$100$, and the duty is $0.1 \times \$100 = \10 . The price to the U.S. consumer after the tariff has been levied is $\$300 + \$10 = \$310$. With the OAP system, the effective tariff rate is only 3.3 percent ($\$10/\300) instead of the 10 percent shown in the tariff schedule.

³This example assumes that the United States is a “small” country, as discussed later in this chapter.

Therefore, the effect of the OAP is to reduce the effective rate of protection of the South Korean assembly activity and to shift demand from American to Korean assemblers. Opponents of the OAP emphasize that the OAP makes imported television sets more price competitive in the U.S. market. They also stress the associated displacement of American assembly workers and the accompanying negative effects on the U.S. balance of trade. However, this “tariff break” is available only if U.S.-made components are used to manufacture television sets. This suggests a simultaneous shift of demand from foreign- to American-made components. Defenders of the OAP emphasize the associated positive effects on the production and exporting of American components. Indeed, the OAP has been a controversial provision in U.S. tariff policy.

Dodging Import Tariffs: Tariff Avoidance and Tariff Evasion

When a country imposes a tariff on imports, there are economic incentives to dodge it. One way of escaping a tariff is to engage in **tariff avoidance**, the legal utilization of the tariff system to one’s own advantage in order to reduce the amount of tariff that is payable by means that are within the law. By contrast, **tariff evasion** occurs when individuals or firms evade tariffs by illegal means such as smuggling imported goods into a country. Let us consider each of these methods.

Ford Strips Its Wagons to Avoid a High Tariff

Several times a month, Ford Motor Company ships its Transit Connect five-passenger wagons from its factory in Turkey to Baltimore, Maryland. Once the passenger wagons arrive in Baltimore, the majority of them are driven to a warehouse where workers listening to rock music rip out the rear windows, seats, and seat belts. Why?

Ford’s behavior is part of its efforts to cope with a lengthy trade conflict. In the 1960s, Europe imposed high tariffs on imported chickens, primarily intended to discourage American sales to West Germany. President Lyndon Johnson retaliated with a 25 percent tariff on imports of foreign-made trucks and commercial vans (motor vehicles for the transport of goods). This tariff exists today and applies to trucks and commercial vans even if they are produced by an American company in a foreign country. However, the U.S. tariff on imports of vehicles in the category of “wagons” and “cars” (motor vehicles for the transport of persons) face a much lower 2.5 percent tariff.

Realizing that a 25 percent tariff would significantly add to the price of its cargo vans sold in the United States, and thus detract from their competitiveness, in 2009 Ford embarked on a program to avoid this tariff. Here’s how it works. Ford ships to the United States the Transit Connect wagons that face a 2.5 percent tariff. Once the wagons reach a processing facility in Baltimore, they are transformed into cargo vans. The rear windows are removed and replaced by a sheet of metal, and the rear seats and seat belts are removed and a new floorboard is screwed into place. Although the vehicles start as five-passenger wagons, Ford converts them into two-seat cargo vans. The fabric is shredded, the steel parts are broken down, and everything is sent along with the glass to be recycled. According to U.S. customs officials, this practice complies with the letter of the law.

Transforming wagons into cargo vans costs Ford hundreds of dollars per vehicle, but the process saves the company thousands in terms of tariff duties. On a \$25,000 passenger wagon, a 2.5 percent tariff would result in a duty of only \$625 ($\$25,000 \times 0.025 = \625). This compares to a duty of \$6,250 that would result from a 25 percent tariff imposed on a

cargo van ($\$25,000 \times 0.25 = \$6,250$). The avoidance of the higher tariff on cargo vans would save Ford \$5,625 on each vehicle ($\$6,250 - \$625 = \$5,625$) minus the cost of transforming the passenger wagon into a cargo van. Smart, huh?

Ford's transformation process is only one way to avoid tariffs. Other auto makers have avoided U.S. tariffs using different techniques. Toyota Motor Corp., Nissan Motor Co., and Honda Motor Co. took the straightforward route and built plants in the United States, instead of exporting vehicles from Japan to the United States that are subject to import tariffs.⁴

Smuggled Steel Evades U.S. Tariffs

Each year, about 38 million tons of steel with a value of about \$12 billion are imported by the United States. About half of this steel is subject to tariffs that range from pennies to hundreds of dollars a ton. The amount of the tariff depends on the type of steel product (there are about 1,000) and on the country of origin (there are about 100). These tariffs are applied to the selling price of the steel in the United States. American customs inspectors scrutinize the shipments that enter the United States to make sure that tariffs are properly assessed. However, monitoring shipments is difficult given the limited staff of the customs service. Therefore, the risk of being caught for smuggling and the odds of penalties being levied are modest, while the potential for illegal profit is high.

Ivan Dubrinski smuggled 20,000 tons of steel into the United States in the first decade of the 2000s. It was easy. All he did was modify the shipping documents on a product called “reinforcing steel bar” to make it appear that it was part of a shipment of another type of steel called “flat-rolled.” This deception saved him about \$38,000 in import duties. Multiply this tariff evasion episode many times over and you have avoided millions of dollars in duties. The smuggling of steel concerns the U.S. government, which loses tariff revenue, and also the U.S. steel industry, which maintains it cannot afford to compete with products made cheaper by tariff evasion.

Although larger U.S. importers of steel generally pay correct duties, it is the smaller, often fly-by-night importers that are more likely to try to slip illegal steel into the country. These traders use one of three methods to evade tariffs. One method is to falsely reclassify steel that would be subject to a tariff as a duty-free product. Another is to detach markings that the steel came from a country subject to tariffs and make it appear to have come from one that is exempt. A third method involves altering the chemical composition of a steel product enough so that it can be labeled duty free.

Although customs inspectors attempt to scrutinize imports, once the steel gets by them, they can do little about it. They cannot confiscate the smuggled steel because it is often already sold and in use. Meanwhile, the people buying the steel get a nice price break, and the American steel companies that compete against smuggled steel find their sales and profits declining.⁵

Postponing Import Tariffs

Besides allowing the avoidance of tariffs, U.S. tariff law allows the postponement of tariffs. Let us see how a bonded warehouse and a foreign trade zone can facilitate the postponing of tariffs.

⁴Drawn from “To Outfox the Chicken Tax, Ford Strips Its Own Vans,” *The Wall Street Journal*, September 23, 2009, p. A-1.

⁵Drawn from “Steel Smugglers Pull Wool over the Eyes of Customs Agents to Enter U.S. Market,” *The Wall Street Journal*, November 1, 2001, pp. A1 and A14.

INTERNATIONAL TRADE APPLICATION

Gains from Eliminating Import Tariffs

What would be the effects if the United States unilaterally removed tariffs and other restraints on imported products? On the positive side, tariff elimination lowers the price of the affected imports and may lower the price of the competing U.S. good, resulting in economic gains to the U.S. consumer. Lower import prices also decrease the production costs of firms that buy less costly intermediate inputs, such as steel. On the negative side, the lower price to import competing producers, as a result of eliminating the tariff, results in profit reductions; workers become displaced from the domestic industry that loses protection; and the



U.S. government loses tax revenue as the result of eliminating the tariff.

In 2011, the U.S. International Trade Commission estimated the annual economic welfare gains from eliminating significant import restraints from their existing levels. The result would have been equivalent to a welfare gain of about \$2.6 billion to the U.S. economy. The largest welfare gain would come from liberalizing trade ethanol, textiles and apparel, and dairy products, as seen in Table 4.6.

What do you think? Should the United States remove all of its tariffs and other restraints on imports?

TABLE 4.6

Economic Welfare Gains from Liberalization of Significant Import Restraints,* 2015 (millions of dollars)

Import-Competing Industry	Annual Change in Economic Welfare
Ethanol	1,513
Textiles and apparel	514
Dairy	223
Footwear and leather products	215
Tobacco	63
Tuna	16
Costume jewelry	12

*Import tariffs, tariff rate quotas, and import quotas.

Source: From U.S. International Trade Commission, *The Economic Effects of Significant U.S. Import Restraints*, Washington, DC, Government Printing Office, 2016.

Bonded Warehouse

According to U.S. tariff law, dutiable imports can be brought into the United States and temporarily left in a **bonded warehouse**, duty free. Importers can apply for authorization from the U.S. Customs Service to have a bonded warehouse on their own premises or they can use the services of a public warehouse that has received such authorization. Owners of storage facilities must be bonded to ensure that they will satisfy all customs duty obligations. This condition means that the bonding company guarantees payment of customs duties in the event that the importing company is unable to do so.

Imported goods can be stored, repacked, or further processed in the bonded warehouse for up to five years. Domestically produced goods are not allowed to enter a bonded warehouse. If warehoused at the initial time of entry, no customs duties are owed. When the time arrives to withdraw the imported goods from the warehouse, duties must be paid on the value of the goods. If the goods are withdrawn for exportation, payment of duty is not required.

While the goods are in the warehouse, the owner may subject them to various processes necessary to prepare them for sale in the market. Such processes might include the repacking and mixing of tea, the bottling of wines, and the roasting of coffee. However, imported components cannot be assembled into final products in a bonded warehouse, nor can the manufacturing of products take place.

A main advantage of a bonded warehouse entry is that no duties are collected until the goods are withdrawn for domestic consumption. The importer has the luxury of controlling the money for the duty until it is paid upon withdrawal of the goods from the bonded warehouse. If the importer cannot find a domestic buyer for its goods or if the goods cannot be sold at a good price domestically, the importer has the advantage of selling merchandise for exportation that cancels the obligation to pay duties. Also, paying duties when goods first arrive in the country can be expensive, and using a bonded warehouse allows importers time to access funds from the sale of the goods to pay the duties rather than having to pay duties in advance.

Foreign-Trade Zone

Similar to a bonded warehouse, a **foreign-trade zone (FTZ)** is an area within the United States where business can operate without the responsibility of paying customs duties on imported products or materials for as long as they remain within this area and do not enter the U.S. marketplace. Customs duties are due only when goods are transferred from the FTZ for U.S. consumption. If the goods never enter the U.S. marketplace, then no duties are paid on those items.

What distinguishes an FTZ from a bonded warehouse? With an FTZ, once merchandise has moved into it, you can do just about anything to the merchandise. You can repackage goods, repair or destroy damaged ones, assemble component parts into finished products, and export either the parts or finished products. The manufacturing of goods is also allowed in FTZs. Therefore, importers who use FTZs can conduct a broader range of business activities than can occur in bonded warehouses that permit only the storage of imported goods and limited repackaging and processing activities.

Many FTZs are situated at U.S. seaports, such as the Port of Seattle, but some are located at inland distribution points. There are currently more than 230 FTZs throughout the United States. Among the businesses that enjoy FTZ status are Exxon, Caterpillar, General Electric, and International Business Machines (IBM).

The FTZ program encourages U.S.-based business operations by removing certain disincentives associated with manufacturing in the United States. The duty on a product manufactured abroad and imported into the United States is paid at the rate of the finished product rather than that of the individual parts, materials, or components of the product. A U.S.-based company would find itself at a disadvantage relative to its foreign competitor if it had to pay a higher rate on parts, materials, or components imported for use in the manufacturing process (this is known as “inverted tariffs”). The FTZ program corrects this imbalance by treating a product manufactured in an FTZ, for purposes of tariff assessment, as if it were produced abroad.

Suppose an FTZ user imports a motor that carries a 5 percent duty rate, and uses it in the manufacture of a lawn mower that is free of duty. When the lawn mower leaves the FTZ and enters the U.S. marketplace, the duty rate on the motor drops from the 5 percent rate to the free lawn mower rate. By participating in the FTZ program, the lawn mower manufacturer has eliminated the duty on this component, and thus decreased the component cost by 5 percent.

An FTZ can also help a firm eliminate import duties on product waste and scrap. Suppose a U.S. chemical company imports raw material that carries a 10 percent duty to

produce a particular chemical that also carries a 10 percent duty. Part of the production process involves bringing the imported raw material to high temperatures. During this process, 20 percent of the raw material is lost as heat. If the chemical company imports \$1 million of raw material per year, it will pay \$100,000 ($\$1 \text{ million} \times 0.1 = \$100,000$) in duty as the raw material enters the United States. However, by participating in the FTZ program, it does not pay duty on the raw material until it leaves the zone and enters the U.S. marketplace. Because 20 percent of the raw material is lost as heat during the manufacturing process, the raw material is now worth only \$800,000. Assuming that all the finished chemical is sold in the United States, the 10 percent customs duty totals only \$80,000. This is a savings of \$20,000. While it may appear that the FTZ program benefits only the U.S. chemical company, it is important to remember that its competitors who make the same product abroad already have the benefit of not having to pay on the waste loss in the production of their chemical.

FTZs Benefit Motor Vehicle Importers

Toyota Motor Co. is an example of a company that benefits from the U.S. FTZ program. Toyota has vehicle-processing centers located within FTZ sites in the United States. Before imported Toyotas are shipped to American dealers, the processing centers clean them, install accessories such as radios and CD players, and so on. A primary benefit of the processing center's being located within an FTZ site is customs duty deferral—the postponement of the payment of duties until the vehicle has been processed and shipped to the dealer.

For parts imported into the United States, Toyota also has parts distribution centers that are located within FTZ sites. Because of extended warranties, Toyota must maintain a large inventory of parts within the United States for a lengthy period of time, which makes the FTZ program attractive from the perspective of duty deferral. Also, a large number of parts may become obsolete and have to be destroyed. By obtaining FTZ designation on its parts distribution center, Toyota can avoid the payment of customs duties on those parts that become obsolete and are destroyed.

Another benefit to Toyota of an FTZ is the potential reduction in the dutiable value of the imported vehicle according to the inverted duty principle, as discussed above. Suppose that a CD player that is imported from Japan is installed at a Toyota processing center within an FTZ site. In 2011, the duty on the imported CD player was 4.4 percent and the duty on a final Toyota automobile was 2.5 percent. Toyota has the ability to reduce the duty on the cost of the CD player by 1.9 percent ($4.4\% - 2.5\% = 1.9\%$) by having the CD player installed at its processing center within the FTZ site.

Tariff Effects: An Overview

Before we make a detailed investigation of tariffs, let us consider an introductory overview of their effects.

Tariffs are taxes on imports. They make the item more expensive for consumers, thus reducing demand. Suppose there is a U.S. company and a foreign company supplying computers. The price of the U.S.-made computer is \$1,000 and the price of foreign-made computer is \$750. The U.S. computer company is not able to stay competitive in this situation.

Suppose that the United States imposes an import tariff of \$300 per computer. The tariff increases the price of imported computers above the foreign price by the amount of the tariff, \$300. American suppliers of computers who compete with suppliers of imported computers can now sell their computers for the foreign price plus the amount of the tariff,

\$1,050 ($\$750 + \$300 = \$1,050$). As the price of computers increases, both imported and domestic consumption decreases. At the same time, the higher price has encouraged American suppliers to expand output. Imports are reduced as domestic consumption decreases and domestic production increases. Notice that a tariff need not push the price of the imported computer above the price of its domestic counterpart for the American computer industry to prosper. The tariff should be just high enough to reduce the price differential between the imported computer and the U.S.-made computer.

If no tariff is imposed, as under free trade, Americans would have saved money by buying the cheaper foreign computer. The U.S. computer industry would either have to become more efficient in order to compete with the less expensive imported product or face extinction.

Although the tariff benefits producers in the U.S. computer industry, it imposes costs to the U.S. economy:

- Computer buyers will have to pay more for their protected U.S.-made computers than they would have for the imported computers under free trade.
- Jobs will be lost at retail and shipping companies that import foreign-made computers.
- The extra cost of the computers gets passed on to whatever products and services that use these computers in the production process.

These costs will have to be weighed against the number of jobs the tariff would save to get a true picture of the impact of the tariff.

Now that we have an overview of the effects of a tariff, let us consider tariffs in a more detailed manner. We will examine the effects of tariffs for a small importing country and a large importing country. Let us begin by reviewing the concepts of consumer surplus and producer surplus as discussed in the next section of this text.

Tariff Welfare Effects: Consumer Surplus and Producer Surplus

To analyze the effect of trade policies on national welfare, it is useful to separate the effects on consumers from those on producers. For each group, a measure of welfare is needed; these measures are known as consumer surplus and producer surplus.

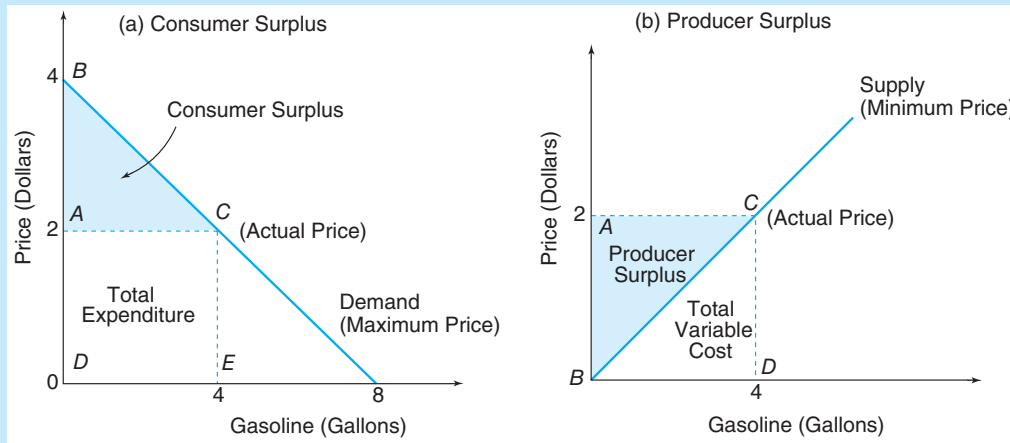
Consumer surplus refers to the difference between the amount that buyers would be willing and able to pay for a good and the actual amount they do pay. To illustrate, assume that the price of a Pepsi is \$0.50. Being especially thirsty, assume you would be willing to pay up to \$0.75 for a Pepsi. Your consumer surplus on this purchase is \$0.25 ($\$0.75 - \$0.50 = \0.25). For all Pepsis bought, consumer surplus is merely the sum of the surplus for each unit.

Consumer surplus can also be depicted graphically. Let us first remember that the height of the market demand curve indicates the maximum price that buyers are willing and able to pay for each successive unit of the good, and in a competitive market, buyers pay a single price (the equilibrium price) for all units purchased. Referring now to Figure 4.1(a), consider the market price of gasoline is \$2 per gallon. If buyers purchase 4 gallons at this price, they spend \$8, represented by area *ACED*. For those 4 gallons, buyers would be willing and able to spend \$12, as shown by area *ABCED*.

The difference between what buyers actually spend and the amount they are willing and able to spend is consumer surplus; in this case, it equals \$4 and is denoted by area *ABC*.

FIGURE 4.1

Consumer Surplus and Producer Surplus



Consumer surplus is the difference between the maximum amount buyers are willing to pay for a given quantity of a good and the amount actually paid. Graphically, consumer surplus is represented by the area under the demand curve and above the good's market price. Producer surplus is the revenue producers receive over and above the minimum necessary for production. Graphically, producer surplus is represented by the area above the supply curve and below the good's market price.

The size of the consumer surplus is affected by the market price. A decrease in the market price will lead to an increase in the quantity purchased and a larger consumer surplus. Conversely, a higher market price will reduce the amount purchased and shrink the consumer surplus.

Let us now consider the other side of the market: producers. **Producer surplus** is the revenue producers receive over and above the minimum amount required to induce them to supply a good. This minimum amount has to cover the producer's total variable costs. Recall that total variable cost equals the sum of the marginal cost of producing each successive unit of output.

In Figure 4.1(b), the producer surplus is represented by the area above the supply curve of gasoline and below the good's market price. Recall that the height of the market supply curve indicates the lowest price at which producers are willing to supply gasoline; this minimum price increases with the level of output because of rising marginal costs. Suppose that the market price of gasoline is \$2 per gallon, and 4 gallons are supplied. Producers receive revenues totaling \$8, represented by area $ACDB$. The minimum revenue they must receive to produce 4 gallons equals the total variable cost that equals \$4 and is depicted by area BCD . Producer surplus is the difference, \$4 ($\$8 - \$4 = \4), and is depicted by area ABC .

If the market price of gasoline rises, more gasoline will be supplied and the producer surplus will rise. It is equally true that if the market price of gasoline falls, the producer surplus will fall. In the following sections, we will use the concepts of consumer surplus and producer surplus to analyze the effects of import tariffs on a nation's welfare.

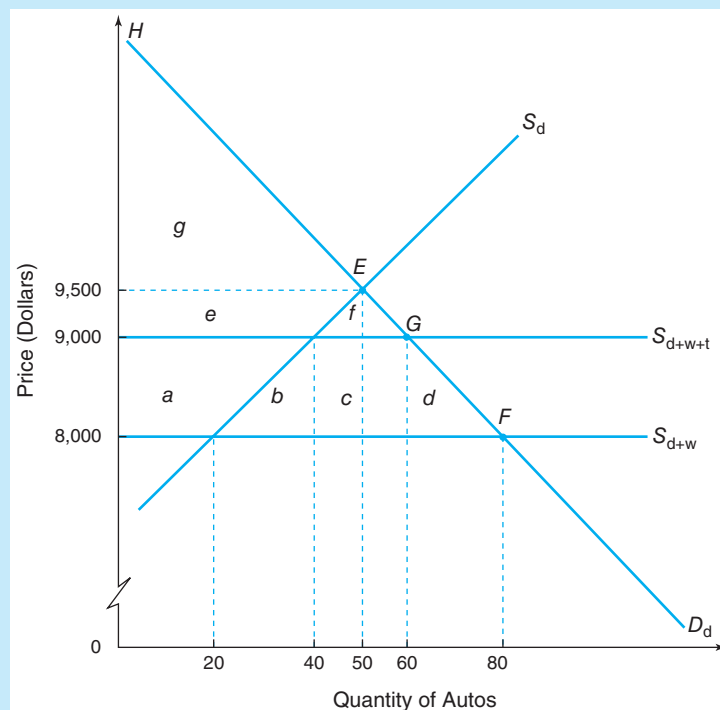
Tariff Welfare Effects: Small-Nation Model

To measure the effects of a tariff on a nation's welfare, consider the case of a nation whose imports constitute a small portion of the world market supply. This **small nation** would be a *price taker*, facing a constant world price level for its import commodity. This is not a rare case; many nations are not important enough to influence the terms at which they trade.

In Figure 4.2, a small nation before trade produces autos at market equilibrium point E , as determined by the intersection of its domestic supply and demand schedules. At the equilibrium price of \$9,500, the quantity supplied is 50 autos, and the quantity demanded is 50 autos. Now suppose that the economy is opened to foreign trade and that the world auto price is \$8,000. Because the world market will supply an unlimited number of autos at the price of \$8,000, the world supply schedule would appear as a horizontal (perfectly elastic) line. Line S_{d+w} shows the supply of autos available to small nation consumers from domestic and foreign sources combined. This overall supply schedule is the one that would prevail in free trade.

FIGURE 4.2

Tariff Trade and Welfare Effects: Small-Nation Model



For a small nation, a tariff placed on an imported product is shifted totally to the domestic consumer via a higher product price. Consumer surplus falls as a result of the price increase. The small nation's welfare decreases by an amount equal to the protective effect and consumption effect, the so-called deadweight losses due to a tariff.

Free trade equilibrium is located at point *F* in the figure. Here the number of autos demanded is 80, whereas the number produced domestically is 20. The import of 60 autos fulfills the excess domestic auto demand. Compared with the situation before trade occurred, free trade results in a fall in the domestic auto price from \$9,500 to \$8,000. Consumers are better off because they can import more autos at a lower price. However, domestic producers now sell fewer autos at a lower price than they did before trade.

Under free trade, the domestic auto industry is being damaged by foreign competition. Industry sales and revenues are falling and workers are losing their jobs. Suppose management and labor unites and convinces the government to levy a protective tariff on auto imports. Assume the small nation imposes a tariff of \$1,000 on auto imports. Because this small nation is not important enough to influence world market conditions, the world supply price of autos remains constant, unaffected by the tariff. This lack of price change means that the small nation's terms of trade remain unchanged. The introduction of the tariff *raises the home price of imports by the full amount of the duty, and the increase falls entirely on the domestic consumer*. The overall supply shifts upward by the amount of the tariff, from S_{d+w} to S_{d+w+t} .

The protective tariff results in a new equilibrium quantity at point *G*, where the domestic auto price is \$9,000. Domestic production increases by 20 units, whereas domestic consumption falls by 20 units. Imports decrease from their pre-tariff level of 60 units to 20 units. This reduction can be attributed to falling domestic consumption and rising domestic production. The effects of the tariff are to impede imports and protect domestic producers. But what are the tariff's effects on the *nation's welfare*?

Figure 4.2 shows that before the tariff was levied, *consumer surplus* equaled areas $a + b + c + d + e + f + g$. With the tariff, consumer surplus falls to areas $e + f + g$, an overall loss in consumer surplus equal to areas $a + b + c + d$. This change affects the nation's welfare in a number of ways. The welfare effects of a tariff include a revenue effect, redistribution effect, protective effect, and consumption effect. As might be expected, the tariff provides the government with additional tax revenue and benefits domestic auto producers; however, at the same time, it wastes resources and harms the domestic consumer.

The tariff's **revenue effect** represents the government's collections of duty. Found by multiplying the number of imports (20 autos) times the tariff (\$1,000), government revenue equals area *c*, or \$20,000. This revenue represents the portion of the loss in consumer surplus in monetary terms that is transferred to the government. For the nation as a whole, the revenue effect does *not* result in an overall welfare loss; the consumer surplus is merely shifted from the private to the public sector.

The **redistributive effect** is the transfer of the consumer surplus in monetary terms, to the domestic producers of the import-competing product. This is represented by area *a*, that equals \$30,000. Under the tariff, domestic home consumers will buy from domestic firms 40 autos at a price of \$9,000, for a total expenditure of \$360,000. At the free trade price of \$8,000, the same 40 autos would have yielded \$320,000. The imposition of the tariff thus results in home producers receiving additional revenues totaling areas $a + b$, or \$40,000 (the difference between \$360,000 and \$320,000). However, as the tariff encourages domestic production to rise from 20 to 40 units, producers must pay part of the increased revenue as higher costs of producing the increased output, depicted by area *b*, or \$10,000. The remaining revenue, \$30,000, area *a*, is a net gain in producer income. The redistributive effect is a transfer of income from consumers to producers. Like the revenue effect, it does *not* result in an overall loss of welfare for the economy.

Area *b*, totaling \$10,000, is referred to as the **protective effect** of the tariff. This effect illustrates the loss to the domestic economy resulting from wasted resources used to produce additional autos at increasing unit costs. As the tariff-induced domestic output expands, resources that are less adaptable to auto production are eventually used, increasing

unit production costs. This increase means that resources are used less efficiently than they would have been with free trade, in which case autos would have been purchased from low-cost foreign producers. A tariff's protective effect thus arises because less efficient domestic production is substituted for more efficient foreign production. Referring to Figure 4.2, as domestic output increases from 20 to 40 units, the domestic cost of producing autos rises, as shown by supply schedule S_d . The same increase in autos could have been obtained at a unit cost of \$8,000 before the tariff was levied. Area b , which depicts the protective effect, represents a loss to the economy equal to \$10,000. Notice that the calculation of the protective effect simply involves the calculation of the area of triangle b . Recall from geometry that the area of a triangle equals $(\text{base} \times \text{height})/2$. The height of triangle b equals the increase in price due to the tariff (\$1,000); the triangle's base (20 autos) equals the increase in domestic auto production due to the tariff. The protection effect is thus $(20 \times \$1,000)/2 = \$10,000$.

Most of the consumer surplus lost because of the tariff has been accounted for: c went to the government as revenue; a was transferred to home producers as income; and b was lost by the economy because of inefficient domestic production. The **consumption effect**, represented by area d , which equals \$10,000, is the residual not accounted for elsewhere. The residual arises from the decrease in consumption resulting from the tariff's artificially increasing the price of autos from \$8,000 to \$9,000. A loss of welfare occurs because of the increased price and lower consumption. Notice that the calculation of the consumption effect involves the calculation of the area of triangle d . The height of the triangle (\$1,000) equals the price increase in autos because of the tariff; the base (20 autos) equals the reduction in domestic consumption based on the tariff. The consumption effect is thus $(20 \times \$1,000)/2 = \$10,000$.

Like the protective effect, the consumption effect represents a real cost to society, not a transfer to other sectors of the economy. Together, these two effects equal the **deadweight loss** of the tariff (areas $b + d$ in the figure).

As long as it is assumed that a nation accounts for a negligible portion of international trade, its levying an import tariff necessarily lowers its national welfare. This is because there is no favorable welfare effect resulting from the tariff that would offset the deadweight loss of the consumer surplus. If a nation could impose a tariff that would improve its terms of trade to its trading partners, it would enjoy a larger share of the gains from trade. This would tend to increase its national welfare, offsetting the deadweight loss of consumer surplus. Because it is so insignificant relative to the world market, a small nation is unable to influence the terms of trade. Levying an import tariff *reduces* a small nation's welfare.

Tariff Welfare Effects: Large-Nation Model

The support for free trade by economists may appear so pronounced that one might conclude that a tariff could never be beneficial. This is not necessarily true. A tariff may increase national welfare when it is imposed by an importing nation that is large enough that changes in the quantity of its imports, by means of tariff policy, influence the world price of the product. This **large nation** status applies to the United States, which is a large importer of autos, steel, oil, and consumer electronics, and to other economic giants such as Japan and the European Union.

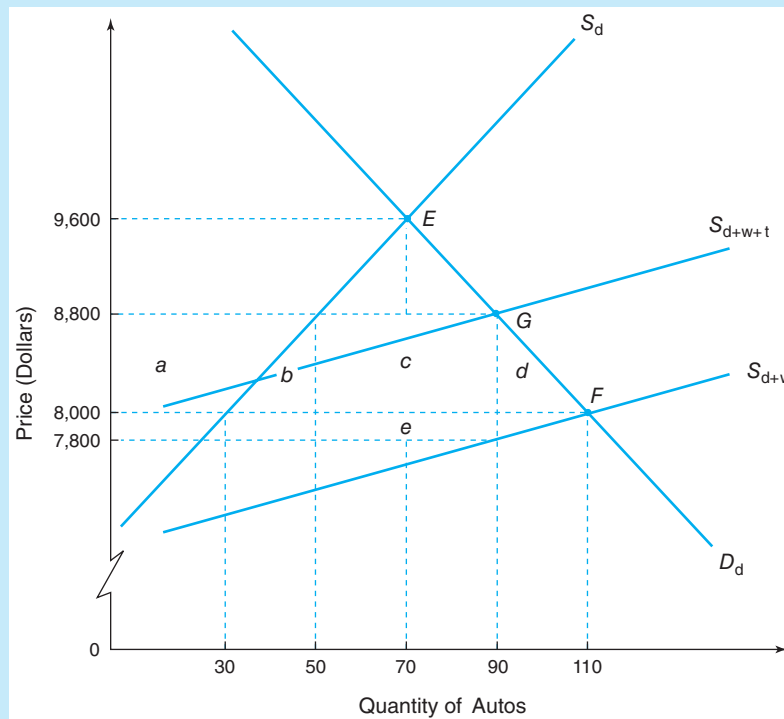
If the United States imposes a tariff on automobile imports, prices increase for American consumers. The result is a decrease in the quantity demanded, which may be significant enough to force Japanese firms to reduce the prices of their exports. Because Japanese firms can produce and export smaller amounts at a lower marginal cost, they are likely to prefer to reduce their price to the United States to limit the decrease in their sales. The tariff's effect is thus shared between U.S. consumers who pay a higher price than under free trade for

each auto imported, and Japanese firms who realize a lower price than under free trade for each auto exported. The difference between these two prices is the tariff duty. The welfare of the United States rises when it can shift some of the tariff to Japanese firms via export price reductions. The *terms of trade* improve for the United States at the expense of Japan.

What are the economic effects of an import tariff for a large country? Referring to Figure 4.3, line S_d represents the domestic supply schedule and line D_d depicts the home demand schedule. Autarky equilibrium occurs at point E . With free trade, the importing nation faces a total supply schedule of S_{d+w} . This schedule shows the number of autos that both domestic and foreign producers together offer domestic consumers. The total supply schedule is upward sloping rather than horizontal because the foreign supply price is not a fixed constant. The price depends on the quantity purchased by an importing country that is a large buyer of the product. With free trade, our country achieves market equilibrium at point F . The price of autos falls to \$8,000, domestic consumption rises to 110 units, and domestic production falls to 30 units. Auto imports totaling 80 units satisfy the excess domestic demand.

FIGURE 4.3

Tariff Trade and Welfare Effects: Large-Nation Model



For a large nation, a tariff on an imported product may be partially shifted to the domestic consumer via a higher product price and partially absorbed by the foreign exporter via a lower export price. The extent by which a tariff is absorbed by the foreign exporter constitutes a welfare gain for the home country. This gain offsets some (all) of the deadweight welfare losses due to the tariff's consumption and protective effects.

Suppose that the importing nation imposes a specific tariff of \$1,000 on imported autos. By increasing the selling cost, the tariff results in a shift in the total supply schedule from S_{d+w} to S_{d+w+t} . Market equilibrium shifts from point F to point G while the product price rises from \$8,000 to \$8,800. The tariff-levying nation's consumer surplus falls by an amount equal to areas $a + b + c + d$. Area a , totaling \$32,000, represents the *redistributive effect*; this amount is transferred from domestic consumers to domestic producers. Areas $d + b$ depict the tariff's deadweight loss, the deterioration in national welfare because of reduced consumption (*consumption effect* = \$8,000) and an inefficient use of resources (*protective effect* = \$8,000).

As in the small-nation example, a tariff's *revenue effect* equals the import tariff multiplied by the quantity of autos imported. This effect yields areas $c + e$, or \$40,000. Notice that the tariff revenue accruing to the government now comes from foreign producers as well as domestic consumers. This result differs from the small-nation case in which the supply schedule is horizontal and the tariff's burden falls entirely on domestic consumers.

The tariff of \$1,000 is added to the free trade import price of \$8,000. Although the price in the protected market will exceed the foreign supply price by the amount of the duty, it will *not* exceed the free trade foreign supply price by this amount. Compared with the free trade foreign supply price of \$8,000, the domestic consumers pay only an additional \$800 per imported auto. This is the portion of the tariff shifted to the consumer. At the same time, the foreign supply price of autos falls by \$200 as foreign producers cut their price to maintain market share. This means that foreign producers earn smaller revenues, \$7,800, for each auto exported. Because foreign production takes place under increasing-cost conditions, the reduction of imports from abroad triggers a decline in foreign production and unit costs decline. The reduction in the foreign supply price of \$200 represents that portion of the tariff borne by the foreign producer. The levying of the tariff raises the domestic price of the import by only part of the duty as foreign producers lower their prices in an attempt to maintain sales in the tariff-levying nation. The importing nation finds that its terms of trade have improved if the price it pays for auto imports decreases, while the price it charges for its exports remains the same.

Thus, the *revenue effect* of an import tariff in the large nation includes two components. The first is the amount of tariff revenue shifted from domestic consumers to the tariff-levying government; in Figure 4.3, this amount equals the level of imports (40 units) multiplied by the portion of the import tariff borne by domestic consumers (\$800). Area c depicts the **domestic revenue effect**, t equals \$32,000. The second element is the tariff revenue extracted from foreign producers in the form of a lower supply price. Found by multiplying auto imports (40 units) by the portion of the tariff falling on foreign producers (\$200), the **terms-of-trade effect** is shown as area e , which equals \$8,000. Note that the terms-of-trade effect represents a redistribution of income from the foreign nation to the tariff-levying nation because of the new terms of trade. The tariff's revenue effect thus includes the domestic revenue effect and the terms-of-trade effect.

A nation that is a major importer of a product is in a favorable trade situation. It can use its tariff policy to improve the terms at which it trades and therefore its national welfare. But remember that the negative welfare effect of a tariff is the deadweight loss of the consumer surplus that results from the protection and consumption effects. Referring to Figure 4.3, to decide if a tariff-levying nation can improve its national welfare, we must compare the impact of the deadweight loss (areas $b + d$) with the benefits of a more favorable terms of trade (area e). The conclusions regarding the welfare effects of a tariff are as follows:

1. If e is greater than $(b + d)$, national welfare is increased.
2. If e equals $(b + d)$, national welfare remains constant.
3. If e is less than $(b + d)$, national welfare is diminished.

In the preceding example, the domestic economy's welfare would decline by an amount equal to \$8,000. This is because the deadweight welfare losses totaling \$16,000 more than offset the \$8,000 gain in welfare attributable to the terms of trade effect.

For a presentation of offer curves in the analysis of tariffs, go to *Exploring Further 4.1*, which can be found in **MindTap**.

Donald Trump's Border Tax: How to Pay for the Wall

When Donald Trump became president of the United States in 2017, he sought to fulfill his campaign promise to secure the southern border of the United States through the construction of a physical wall on the border with Mexico, monitored and supported by adequate staff so as to prevent illegal immigration, drug and human trafficking, and acts of terrorism. Cost estimates for border wall construction and maintenance ran into the tens of billions of dollars.

During the presidential campaign, Trump stated that he not only wanted the wall, but he wanted Mexico to pay for it. However, Mexico's government officials refused. Trump responded by declaring that a new 20 percent border tax on imports from Mexico could be used to pay for the wall.

What is a border tax? It is just Trump's term for what the rest of the world calls a tariff. It is a tax on imports imposed at a certain rate on a certain product against a certain country—say, a 20 percent tariff on Mexican tomatoes.

Would a border tax result in Mexico paying for the wall? Concerning Figure 4.3 on page 132 of this textbook, recall that as a large country, the United States may be able to improve its terms of trade by levying a tariff on imports. Although part of the tariff on an imported product may be shifted to the American consumer via a higher product price, the remaining part is absorbed by the foreign producer via a lower export price to the United States, resulting in improving terms of trade for the United States.

In the context of a Mexican border tax, to the extent that Mexicans absorb the cost of the tariff by cutting their prices to maintain market share in the United States, they would pay for the wall. However, if the tariff gets passed along in higher U.S. prices, then Americans will pay for the wall. It probably would be some of each. The irony of the border tax is that while a tax on Mexican imports can be portrayed as making Mexico pay for the wall, a sizable share of the tariff would likely be passed through into higher U.S. prices, therefore actually resulting in American consumers also paying for the wall.

To some observers, Trump's threat to levy a discriminatory tariff against Mexico conveyed the impression that the United States was willing to break its international commitments. The threat not only violated the North American Free Trade Agreement that the United States maintains with Mexico and Canada, but it represented a contradiction of the World Trade Organization (WTO) to which the United States is a member. The WTO operates so as to maintain tariffs below pledged rates and not to discriminate among WTO members. Border taxes on just one member (Mexico) in excess of U.S. pledged maximum rates appeared to violate these commitments.⁶

Another controversial trade policy of Trump was his announcement (March 2018) that he would impose a 25 percent tariff on imported steel and a 10 percent tariff on imported

⁶Bob Carbaugh and Toni Sipic, "Paying for the Trump Wall Boondoggle," *Challenge*, July-August, 2017; Peter Coy, "Taxing Mexico. Or Not," *Bloomberg Business Week*, February 6–12, 2017; Chad Brown, "Trump's Border Tax is not the Right Fix for U.S.-Mexico Trade," *PBS NewsHour*, January 30, 2017; Robert Lawrence, "The Great Irony of the Mexico Tariff Is that Americans Would Pay for It Too," *PBS NewsHour*, January 27, 2017; and Steve Weisman and Caroline Freund, *Border Tax: What You Need to Know*, Peterson Institute for International Economics, Washington, DC, January 24, 2017.

aluminum. This announcement occurred at the writing of this text. For more information about this topic, refer to *Exploring Further 4.2*, which can be found in **MindTap**.

The Optimal Tariff and Retaliation

We have seen that a large nation can improve its terms of trade by imposing a tariff on imports. However, a tariff causes the volume of imports to decrease, which lessens the nation's welfare by reducing its consumption of low-cost imports. There is a gain because of improved terms of trade and a loss due to reduced import volume.

Referring to Figure 4.3, a nation optimizes its economic welfare by imposing a tariff rate at which the positive difference between the gain of improving terms of trade (area *e*) and the loss in economic efficiency from the protective effect (area *b*) and the consumption effect (area *d*) is at a maximum. The **optimal tariff** refers to such a tariff rate. It makes sense that the lower the foreign elasticity of supply, the more the large country can get its trading partners to accept lower prices for the large country's imports.

A likely candidate for a nation imposing an optimal tariff would be the United States; it is a large importer compared with world demand of autos, electronics, and other products. An optimal tariff is only beneficial to the importing nation. Because any benefit accruing to the importing nation through a lower import price implies a loss to the foreign exporting nation, imposing an optimal tariff is a **beggar-thy-neighbor policy** that could invite retaliation. After all, if the United States were to impose an optimal tariff of 25 percent on its imports, why should Japan and the European Union not levy tariffs of 40 or 50 percent on their imports? When all countries impose optimal tariffs, it is likely that everyone's economic welfare will decrease as the volume of trade declines. The possibility of foreign retaliation may be a sufficient deterrent for any nation considering whether to impose higher tariffs.

A classic case of a tariff-induced trade war was the implementation of the Smoot–Hawley Tariff Act by the U.S. government in 1930. This tariff was initially intended to provide relief to U.S. farmers. Senators and members of Congress from industrial states used the technique of vote trading to obtain increased tariffs on manufactured goods. The result was a policy that increased tariffs on more than a thousand products with an average nominal duty on protected goods of 53 percent! Viewing the Smoot–Hawley tariff as an attempt to force unemployment on its workers, 12 nations promptly increased their duties against the United States. American farm exports fell to one-third of their former level, and between 1930 and 1933, total U.S. exports fell by almost 60 percent. Although the Great Depression accounted for much of that decline, the adverse psychological impact of the Smoot–Hawley tariff on business activity cannot be ignored.

Examples of U.S. Tariffs

Let us now consider two examples of tariffs that have been imposed to protect American producers from foreign competition.

Obama's Tariffs on Chinese Tires

President Barack Obama's import tariffs on tires provide an example of protectionism intended to aid a domestic industry. As a condition for China's entering the WTO in 2001, it agreed that other nations could clamp down on surges of imports from China without having to prove unfair trade practices. This special safeguard lasted until 2013. The surge became real when China increased its shipments of tires for automobiles and light trucks to the United States by almost 300 percent during 2004–2008 to \$1.8 billion. Four American tire plants were closed and about 4,500 tire production jobs were lost during that period according to the United Steelworkers (USW) union.

In response to a complaint by the USW, Obama imposed a tariff in 2009 in addition to the existing tariff, for a three-year period on imports of tires from China. The tariff was applied to low-price tires, roughly \$50 to \$60 apiece, that constitute the bulk of the tires China exports to the United States. The amount of the additional tariff was set at 35 percent in the first year, 30 percent in the second year, and 25 percent in the third year. The move would cut off about 17 percent of all tires sold in the United States. Obama justified his tariff policy by stating that he was simply enforcing the rule the Chinese had accepted. Critics maintained that Obama was pandering to blue-collar workers and union leaders who were needed to support his legislative agenda regarding health care and other issues.

The tariff signaled Obama's desire to keep his word announced during his presidential campaign about protecting American jobs, many of which have moved to China and left employment holes in American manufacturing industries. The USW hailed the decision by declaring that it was the right thing to do for beleaguered American tire workers. Officials of China's government stated that Obama's decision sent the wrong signal to the world: Not only was it a grave act of trade protectionism, but it violated rules of the WTO and contradicted open market commitments that the U.S. government made at the G20 financial summit in 2009.

According to the Obama administration, the tariffs would significantly reduce tire imports from China and boost U.S. industry sales and prices, resulting in increased profitability. This profitability would result in the preservation of jobs and the creation of new ones, as well as encourage investment. Also, the tariff would have little or no impact on the U.S. production of automobiles and light trucks because tires account for a very small share of the total cost of those products. Moreover, tires account for a relatively small share of the annual cost of owning and operating an automobile or light truck.

Critics contended that the story was more complicated. They noted that the USW petition for the tariff increase was not supported by American tire companies because they had already abandoned making low-cost tires in the United States: Tire company officials declared that it was not profitable to produce inexpensive tires in domestic plants in view of competition from foreign companies. Most American tire companies, such as Goodyear Tire and Rubber Co. and Cooper Tire and Rubber Co., manufacture low-cost tires in China that they sell in the United States. Any other American tire manufacturer that wanted to get involved in the low-end business would have to revamp factory lines to produce such tires, a costly and complicated practice that would require considerable time. Critics also noted that if Chinese tire exports to the United States were blocked by the tariff, low-wage manufacturers in other countries would replace them. However, it would take many months for producers in places like Brazil and Indonesia to pick up the slack. In the meantime, shortages of low-end tires would likely appear in the U.S. market, resulting in prices increasing by an estimated 20 to 30 percent. Therefore, it was not clear that the Obama tariffs would actually lead to more jobs for the American tire worker or be good for the nation as a whole, according to the critics.

Economists at the Peterson Institute for International Economics have estimated the effects of the Obama tariffs on the American job market. They found that the tariffs saved a maximum of 1,200 American jobs. Also, American buyers of car and light truck tires paid a sizable price for the tariff barriers. The total cost to American consumers resulting from the tariffs on Chinese tires was about \$1.1 billion in 2011. The cost per job saved was at least \$900,000 in that year. Only a very small fraction of this amount reached the pockets of tire workers. Instead, most of the money wound up in the coffers of tire companies, mainly abroad but also in the United States. The imposition of the tire tariffs provided mixed evidence of their effects. The biggest beneficiaries of the tariffs were probably tire producers

in Indonesia, South Korea, and Thailand, which replaced supply from China during the three-year period of the tariffs.⁷

Should Footwear Tariffs Be Given the Boot?

In 2013, shoppers were busy hunting for bargains at shoe departments of Target, Walmart, and other discount stores. They encountered a wide assortment of shoes for children and adults. What they may have not realized was that most of the shoes sold at stores in the United States are produced abroad and are subject to substantial import tariffs. Why impose high tariffs on footwear?

American footwear tariffs began in the 1930s. At that time, there was a large shoe industry in the United States that produced mostly rubber and canvas footwear. Tariffs protected these producers from less expensive imports. Although many U.S. tariffs have been greatly decreased or eliminated since the 1930s, footwear tariffs have remained mostly unchanged. Although the U.S. footwear has benefitted from tariff protection, it is now virtually extinct; almost 99 percent of all footwear sold in America is currently imported. Nevertheless, footwear tariff rates have continued and are as high as 67.5 percent. Why does the U.S. government impose high tariffs on footwear when there is virtually no American industry to protect?

Critics contend that footwear tariffs are a hidden tax on a household necessity, increasing costs for consumers. Also, they note that discount store sneakers are subject to a 48 percent tariff, while leather dress shoes are taxed at only 8.5 percent. Therefore, a Wall Street executive pays a lower tariff rate on his Italian leather loafers, while low-income households pay more than five times this tariff rate for their shoes. Footwear tariffs are regressive and thus burden people at the lower end of the income ladder more than the wealthy.

In 2013 the Affordable Footwear Act was introduced to Congress. This legislation attempts to abolish the most severe of these footwear tariffs—the sizable tariffs on lower to moderately priced footwear no longer produced in America. The passage of this legislation would result in the removal of tariffs on about one-third of all footwear imports. The goal is to ultimately reduce the price of shoes, a product that everyone buys, especially lower-income households. The legislation ensures that protections continue for the few remaining U.S. footwear producers.

Critics of the Affordable Footwear Act consider high shoe tariffs as essential in shielding U.S. footwear producers from foreign competition. New Balance Inc. operates factories employing about 1,400 people in the United States. The company maintains that a reduction in footwear tariffs could harm its workers. Yet proponents of the Affordable Footwear Act contend that U.S. footwear companies generally produce specialty and high-value shoes, not the types of inexpensive shoes that are subject to the tariff cut provisions of the Affordable Footwear Act. Although the Affordable Footwear Act was introduced to Congress in 2013, it was not passed by the U.S. government.⁸

⁷Gary Clyde Hufbauer and Sean Lowry, “U.S. Tire Tariffs: Saving Few Jobs at High Cost,” Policy Brief, Peterson Institute for International Economics, April 2012.

⁸H.R. 1708: *Affordable Footwear Act of 2013*, 113th Congress, 2013–2015; “Shoe Importers Push to Cut Long-Standing Tariff,” *Los Angeles Times*, July 1, 2012; Eric Martin, “New Balance Wants Its Tariffs, Nike Doesn’t,” *Bloomberg Businessweek*, May 3, 2012; “Footwear Business Hopes to Stomp Out Higher Outdoor Shoe Tariffs,” CBS/Denver, November 29, 2012; Edward Gresser and Bryan Riley, “Give Shoe Taxes the Boot,” *Progressive Economy*, The Heritage Foundation, April 24, 2012; and “A Shoe Tariff with a Big Footprint,” *The Wall Street Journal*, November 22, 2012.

INTERNATIONAL TRADE APPLICATION

Could a Higher Tariff Put a Dent in the Federal Debt?

The debt of the U.S. government is of much concern to policymakers and citizens alike. Solutions range from raising income taxes to cutting spending on national defense and entitlements. In an old U.S. customs house in New York City, there is a sign that says that at one time the U.S. government paid for all of its debt from a war by imposing tariffs on imported goods. Could a higher import tariff of, say, 20 percent currently be used to pay for Medicare and noticeably reduce the federal debt?

It is true that tariffs originally accounted for the bulk of federal government revenue—in 1795, about 95 percent of federal receipts came from tariff revenue. However, the importance of tariffs declined as tariffs were reduced and the income tax, enacted in 1913, came to be the major source of federal revenue. Today, tariffs are present on about 30 percent of goods imported by the United States, and they generate only about \$25 billion of revenue per year, amounting to 1.2 percent of federal revenue. Also, the average U.S. tariff rate is about 2 percent of the price of an imported good.



So should the government raise tariffs to 20 percent, a 10-fold increase of the current rate? Multiply the \$25 billion of annual revenue that the federal government collects from tariffs by 10 and you would get an additional \$250 billion of revenue each year, assuming that imports do not decrease if they go up in price by 20 percent, a dubious assumption. But let's not deal with that assumption. Because right now the U.S. government is borrowing over a trillion dollars a year to cover its deficit. Uh... Eliminating that much debt would require a gigantic tariff, again assuming no decrease in import purchases. That could invite retaliatory tariffs imposed by our trading partners. Raising tariffs is not a good option for getting the United States out of debt.

What do you think? Is increasing tariffs a good idea for the U.S. government to get out of debt?

Source: Paul Solman, "Could a Higher Import Tariff Pay for Medicare and Get the U.S. Out of Debt?" *The Business Desk*, January 5, 2012, available at <http://www.pbs.org/newshour/businessdesk/2012/01/could-a-higher-import-tariff-phtml>.

How a Tariff Burdens Exporters

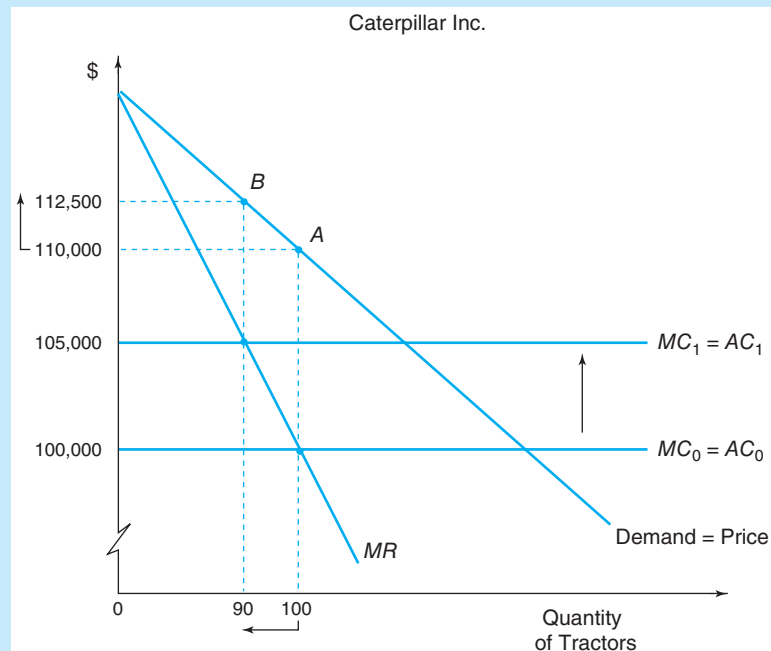
The benefits and costs of protecting domestic producers from foreign competition, as discussed earlier in this chapter, are based on the direct effects of an import tariff. Import-competing producers and workers can benefit from tariffs through increases in output, profits, jobs, and compensation. A tariff imposes costs on domestic consumers in the form of higher prices for protected products and reductions in the consumer surplus. There is also a net welfare loss for the economy because not all of the loss in the consumer surplus is transferred as gains to domestic producers and the government (the protective and consumption effects).

A tariff carries additional burdens. In protecting import-competing producers, a tariff leads indirectly to a reduction in domestic exports. The net result of protectionism is to move the economy toward greater self-sufficiency, with lower imports and exports. For domestic workers, the protection of jobs in import-competing industries comes at the expense of jobs in other sectors of the economy, including exports. Although a tariff is intended to help domestic producers, the economy-wide implications of a tariff are adverse for the export sector. The welfare losses because of restrictions in output and employment in the economy's export industry may offset the welfare gains enjoyed by import-competing producers.

Because a tariff is a tax on imports, the burden of a tariff falls initially on importers who must pay duties to the domestic government. However, importers generally try to shift increased costs to buyers through price increases. The resulting higher prices of imports injure domestic exporters in at least three ways.

FIGURE 4.4

How an Import Tariff Burdens Domestic Exporters



A tariff placed on imported steel increases the costs of a steel-using manufacturer. This increase leads to a higher price charged by the manufacturer and a loss of international competitiveness.

First, exporters often purchase imported inputs subject to tariffs that *increase the cost of inputs*. Because exporters tend to sell in competitive markets where they have little ability to dictate the prices they receive, they generally cannot pass on a tariff-induced increase in cost to their buyers. Higher export costs thus lead to higher prices and reduced overseas sales.

Consider the hypothetical case of Caterpillar Inc., a U.S. exporter of tractors. In Figure 4.4, suppose the firm realizes constant long run costs, suggesting that marginal cost equals average cost at each level of output. Let the production cost of a tractor equal \$100,000, denoted by $MC_0 = AC_0$. Caterpillar Inc. maximizes profits by producing 100 tractors, the point at which marginal revenue equals marginal cost, and selling them at a price of \$110,000 per unit. The firm's revenue thus totals \$11 million ($100 \times \$110,000$), while its costs total \$10 million ($100 \times \$100,000$); the firm realizes profits of \$1 million. Suppose now that the U.S. government levies a tariff on steel imports while foreign nations allow steel to be imported duty free. If the production of tractors uses imported steel, and competitively priced domestic steel is not available, the tariff leads to an increase in Caterpillar's costs to \$105,000 per tractor, as denoted by $MC_1 = AC_1$. Again, the firm maximizes profits by operating where marginal revenue equals marginal cost. However, Caterpillar must charge a higher price, \$112,500; the firm's sales decrease to 90 tractors and profits decrease to \$675,000 [$(\$112,500 - \$105,000) \times 90 = \$675,000$]. The import tariff applied to steel represents a tax on Caterpillar that reduces its international

competitiveness. Protecting domestic steel producers from import competition can thus lessen the export competitiveness of domestic steel using producers.

Tariffs also *raise the cost of living* by increasing the price of imports. Workers have the incentive to demand correspondingly higher wages, resulting in higher production costs. Tariffs lead to expanding output for import-competing producers that bid for workers, causing wages to rise. As these higher wages pass through the economy, export producers ultimately face higher wages and production costs that lessen their competitive position in international markets.

In addition, import tariffs have *international repercussions* that lead to reductions in domestic exports. Tariffs cause the quantity of imports to decrease, and that decreases other nations' export revenues and ability to import. The decline in foreign export revenues results in a smaller demand for a nation's exports and leads to falling output and employment in its export industries.

If domestic export producers are damaged by import tariffs, why don't they protest such policies more vigorously? One problem is that tariff-induced increases in costs for export producers are subtle and invisible. Many exporters may not be aware of their existence. Also, the tariff-induced cost increases may be of such magnitude that some potential export producers are incapable of developing and have no tangible basis for political resistance.

U.S. steel-using companies provide an example of exporters opposing tariffs on imported steel. Their officials contend that restrictions on steel imports are harmful to U.S. steel-using industries that employ about 13 million workers compared to less than 200,000 workers employed by American steel producers. In the global economy, U.S. steel-users must compete with efficient foreign manufacturers of all types of consumer and industrial installations, machines, and conveyances—everything from automobiles and earth moving equipment to nuts and bolts. Forcing U.S. manufacturers to pay considerably more for steel inputs than their foreign competitors would deal U.S. manufacturers a triple blow: increase raw material costs; threaten access to steel products not manufactured in the United States; and increase competition from abroad for the products they make. It would simply send our business offshore, devastating U.S. steel-using companies, most of which are small businesses.⁹

Tariffs and the Poor: Regressive Tariffs

A popular argument that supports trade protectionism is that raising tariffs on imports imposes a very small cost on many domestic consumers to protect concentrated populations within particular domestic industries. However, many overlook the fact that like any tax, the tariff burden does not fall uniformly across goods, but falls more heavily on particular goods and the people who buy them. A legitimate concern of government officials is whether the costs of tariffs are shared uniformly by all consumers in a country, or whether some income groups absorb a disproportionate share of the costs.

Several studies have considered the income distribution effects of U.S. import tariffs. They conclude that tariffs tend to be inequitable because they impose the most severe costs on *low-income households*. Why? Lower-income households generally spend more on imported goods as a share of income than do richer households. Also, relatively high tariffs are often applied to products at the lower end of the price and quality range, which are mainly purchased by lower-income households. For example, basic products such as shoes and clothing are subject to higher levels of tariffs, and these items constitute a larger share of the budgets of low-income households than richer households. Simply put, U.S. tariffs are highest on goods that are the most important to the poor.

⁹U.S. Senate Finance Committee, *Testimony of John Jenson*, February 13, 2002.

Tariffs can be likened to sales taxes on the products protected, and as typically occurs with sales taxes, their effects are *regressive*. U.S. tariff policy is tough on the poor: Young, single mothers purchasing cheap clothes and shoes at Walmart often pay tariff rates 5 to 10 times higher than rich families pay when purchasing at elite stores such as Neiman Marcus or Nordstrom.¹⁰ International trade agreements have eliminated most U.S. tariffs on high-technology products like airplanes, semiconductors, computers, medical equipment, and medicines. The agreements have also reduced rates to generally less than 5 percent on mid-range manufactured products like autos, TV sets, pianos, felt-tip pens, and many luxury consumer goods. Moreover, tariffs on natural resources such as oil, metal ores, and farm products like chocolate and coffee that are not grown in the United States are generally close to zero. However, inexpensive clothes, luggage, shoes, watches, and silverware have been excluded from most tariff reforms, and tariffs remain relatively high. Inexpensive clothing tariffs, for example, are usually in the 10 to 32 percent range.

Table 4.7 provides examples of relatively high U.S. tariffs placed on cheaper products rather than on luxuries. This discrepancy occurs because elite firms such as Ralph Lauren, Coach, or Oakley, which sell brand name and image, find small price advantages relatively unimportant. Because they have not lobbied the U.S. government for high tariffs, rates on luxury goods such as silk lingerie, silver-handled cutlery, leaded glass beer mugs, and snakeskin handbags are low. Producers of cheap water glasses, stainless steel cutlery, nylon lingerie, and plastic purses benefit by adding a few percentage points to their competitors' prices.

Economists at the Peterson Institute for International Economics have estimated the impact of U.S. tariffs on American households of varying income levels. As seen in Table 4.8, their study concluded that U.S. tariffs broadly operate as a regressive tax that puts more pressure on lower-income households than upper-income households.

Besides bearing down hard on the poor, U.S. tariff policy affects different countries in different ways. Tariff policy especially burdens countries that specialize in the cheapest goods, noticeably poor countries in Asia and the Middle East. Average tariffs on European exports to the United States—mainly autos, computers, power equipment, and chemicals—today barely exceed 1 percent. Developing countries such as Malaysia that specialize in

TABLE 4.7**U.S. Tariffs Are High on Cheap Goods, Low on Luxuries**

Product	Tariff Rate (percent)
Men's knitted shirts	
Synthetic fiber	32.5
Cotton	20.0
Silk	1.9
Handbags	
Plastic-sided	16.8
Leather, under \$20	10.0
Reptile leather	5.3

Source: From U.S. International Trade Commission, *Tariff Schedules of the United States*, Washington, DC, Government Printing Office, 2013, available at <http://www.usitc.gov/taffairs.htm>.

¹⁰Edward Gresser, "Toughest on the Poor: America's Flawed Tariff System," *Foreign Affairs*, November–December, 2002, pp. 19–23.

TABLE 4.8**Regressive Effect of U.S. Import Tariffs**

Annual Household Pretax Average Tariff Faced by

Income (dollars)	Consumers (percent)*
Under \$15,000	12.52
15,000–19,999	11.16
20,000–29,999	9.85
30,000–39,999	10.39
40,000–49,999	9.14
50,000–69,999	8.14
70,000–79,999	8.29
80,000–99,999	7.93
100,000–119,999	6.52
120,000–149,999	6.11
150,000 and more	5.24

*Based on 21 product groups ranging from fruits and vegetables to clothing and furniture.

Source: Tyler Moran, *Tariffs Hit Poor Americans Hardest*, Peterson Institute for International Economics, July 31, 2014. See also Jason Furman, Kathryn Russ, and Jay Shambaugh, *U.S. Tariffs Are an Arbitrary and Regressive Tax*, VOX CEPR's Policy Portal, January 12, 2017.

information technology goods face tariff rates just as low. So do oil exporters such as Saudi Arabia and Nigeria. Asian countries like Cambodia and Bangladesh are hit hardest by U.S. tariffs; their cheap consumer goods often face tariff rates of 15 percent or more, some 10 times the world average.

Arguments for Trade Restrictions

The **free trade argument** is, in principle, persuasive. It states that if each nation produces what it does best and permits trade, over the long run all will enjoy lower prices and higher levels of output, income, and consumption than could be achieved in isolation. In a dynamic world, comparative advantage is constantly changing due to shifts in technologies, input productivities, and wages, as well as demand. A free market compels adjustment to take place. The efficiency of an industry must improve or resources will flow from low productivity uses to those with high productivity. Tariffs and other trade barriers are viewed as tools that prevent the economy from undergoing adjustment, resulting in economic stagnation.

Although the free trade argument tends to dominate in the classroom, virtually all nations have imposed restrictions on the international flow of goods, services, and capital. Often, proponents of protectionism say that free trade is fine in theory, but it does not apply in the real world. Modern trade theory assumes perfectly competitive markets whose characteristics do not reflect real-world market conditions. Moreover, even though protectionists may concede that economic losses occur with tariffs and other restrictions, they often argue that noneconomic benefits such as national security more than offset the economic losses. In seeking protection from imports, domestic industries and labor unions attempt to secure their economic welfare. Over the years, many arguments have been advanced to pressure the president and Congress to enact restrictive measures.

Job Protection

The issue of jobs has been a dominant factor in motivating government officials to levy trade restrictions on imported goods. During periods of economic recession, workers are especially eager to point out that cheap foreign goods undercut domestic production, resulting in a loss of domestic jobs to foreign labor. Alleged job losses to foreign competition historically have been a major force behind the desire of most U.S. labor leaders to reject free trade policies.

This view has a serious omission—it fails to acknowledge the dual nature of international trade. Changes in a nation's imports of goods and services are closely related to changes in its exports. Nations export goods because they desire to import products from other nations. When the United States imports goods from abroad, foreigners gain purchasing power that will eventually be spent on U.S. goods, services, or financial assets. American export industries then enjoy gains in sales and employment, whereas the opposite occurs with U.S. import-competing producers. Rather than promoting overall unemployment, imports tend to generate job opportunities in some industries as part of the process by which they decrease employment in other industries. The job gains because of open trade policies tend to be less visible to the public than the readily observable job losses stemming from foreign competition. The more conspicuous losses have led many U.S. business and labor leaders to combine forces in their opposition to free trade.

Trade restraints raise employment in the protected industry (such as steel) by increasing the price (or reducing the supply) of competing import goods. Industries that are primary suppliers of inputs to the protected industry also gain jobs. However, industries that purchase the protected product (such as auto manufacturers) face higher costs. These costs are then passed on to the consumer through higher prices, resulting in decreased sales. Employment falls in these related industries.

Economists at the Federal Reserve Bank of Dallas have examined the effects on U.S. employment of trade restrictions on textiles and apparel, steel, and automobiles. They conclude that trade protection has little or no positive effect on the level of employment in the long run. Trade restraints tend to provide job gains for only a few industries, while they result in job losses spread across many industries.¹¹

A striking fact about efforts to preserve jobs is that each job often ends up costing domestic consumers more than the worker's salary! In 1986, the annual consumer cost of protecting each job preserved in the specialty steel industry in the United States was reported to be \$1 million a year; this was far above the salary a production employee in that industry receives. The fact that costs to consumers for each production job saved are so high supports the argument that an alternative approach should be used to help workers, and that workers departing from an industry facing foreign competition should be liberally compensated (subsidized) for moving to new industries or taking early retirement.¹²

Protection against Cheap Foreign Labor

One of the most common arguments used to justify the protectionist umbrella of trade restrictions is that tariffs are needed to defend domestic jobs against cheap foreign labor. As indicated in Table 4.9, production workers in Germany and the United States have been paid much higher wages in terms of U.S. dollars, than workers in countries such as the

¹¹Linda Hunter, "U.S. Trade Protection: Effects on the Industrial and Regional Composition of Employment," Federal Reserve Bank of Dallas, *Economic Review*, January 1990, pp. 1–13.

¹²Other examples of the annual cost of import restrictions per job saved to the American consumer include: bolts and nuts, \$550,000; motorcycles, \$150,000; mushrooms, \$117,000; automobiles, \$105,000; and footwear, \$55,000. See Gary Hufbauer et al. *Trade Protection in the United States: 31 Case Studies*. Washington, DC: Institute for International Economics, 1986.

Philippines and Mexico. It could be argued that low wages abroad make it difficult for U.S. producers to compete with producers using cheap foreign labor and that unless U.S. producers are protected from imports, domestic output and employment levels will decrease.

When Maytag moved its production of clothes washers and dryers from Iowa to Mexico, cheap labor was the main reason. The same consideration resulted in Levi Strauss and Co., the famous American jeans manufacturer, to relocate from the United States to Mexico and China.

TABLE 4.9

Hourly Compensation Costs in U.S. Dollars for Production Workers in Manufacturing, 2015

Country	Hourly Compensation (dollars per hour)
Norway	49.67
Germany	42.42
United States	37.71
United Kingdom	31.44
Japan	23.60
Taiwan	9.51
Mexico	5.90
Philippines	2.16

Source: From The Conference Board, *International Comparisons of Hourly Compensation Costs in Manufacturing, 2015*, April 12, 2016, available at www.conference-board.org.

Indeed, it is widely believed that competition from goods produced in low-wage countries is unfair and harmful to American workers. Moreover, it is thought that companies that produce goods in foreign countries to take advantage of cheap labor should not be allowed to dictate the wages paid to American workers. A solution would be to impose a tariff or tax on goods brought into the United States equal to the wage differential between foreign and U.S. workers in the same industry. That way, competition would be confined to who makes the best product, not who works for the least amount of money. If Calvin Klein wants to manufacture sweatshirts in Pakistan, his firm would be charged a tariff or tax equal to the difference between the earnings of a Pakistani worker and a U.S. apparel worker.

Although this viewpoint may have widespread appeal, it fails to recognize the links among efficiency, wages, and production costs. Even if domestic wages are higher than those abroad, if domestic labor is more productive than foreign labor, domestic labor costs may still be competitive. Total labor costs reflect not only the wage rate but also the output per labor hour. If the productive superiority of domestic labor more than offsets the higher domestic wage rate, the home nation's labor costs will actually be less than they are abroad. Low wages in developing countries are often offset by higher productivity in the United States.

Table 4.10 shows labor productivity (output per worker), wages, and unit labor costs in manufacturing, relative to the United States, for several nations during 2006–2009. We see that wages in these nations were only fractions of U.S. wages; however, labor productivity levels in these nations were also fractions of U.S. labor productivity. Even if wages in a foreign country are lower than in the United States, the country would have higher unit labor costs if its labor productivity is sufficiently lower than U.S. labor productivity. This was the case for countries such as Hong Kong, South Africa, Japan, and the United Kingdom where the unit labor cost ratio (unit labor cost ratio = wage ratio/labor productivity ratio) was greater than 1.0. These nations' unit labor costs exceeded those of the United States

TABLE 4.10

Productivity, Wages, and Unit Labor Costs, Relative to the United States: Total Manufacturing (United States = 1.0)

Country	Labor Productivity Relative to United States	Wages Relative to United States*	Unit Labor Cost Relative to United States	
Hong Kong (2008)	0.21	0.44	2.09	
Mauritius (2007)	0.06	0.12	2.00	
South Africa (2008)	0.14	0.27	1.93	
European Union (2009)	0.46	0.84	1.83	
United Kingdom (2009)	0.50	0.84	1.68	U.S. More Competitive
Singapore (2008)	0.40	0.61	1.53	U.S. Less Competitive
Japan (2008)	0.67	0.72	1.07	
Mexico (2009)	0.18	0.17	0.94	
South Korea (2006)	0.71	0.61	0.86	
Poland (2006)	0.26	0.20	0.77	
China (2008)	0.12	0.08	0.67	

*At market exchange rate.

Source: The author wishes to thank Professor Steven Golub of Swarthmore College, who provided data for this table. Refer to his *CESifo Working Paper* at the Center for Economic Studies, University of Munich, Munich, Germany, 2011. See also Janet Ceglowski and Stephen Golub, "Are China's Labor Costs Still Low?" This paper was prepared for the CESifo conference on China and the Global Economy Post Crisis, held in Venice, Italy, July 18–19, 2011.

because the productivity gap of their workers exceeded the wage gap. Low wages by themselves do not guarantee low production costs. If they did, countries such as Botswana and Malaysia would dominate world trade.

Another limitation of the cheap foreign labor argument is that low-wage nations tend to have a competitive advantage only in the production of goods requiring greater labor and little of the other factor inputs—that is, only when the wage bill is the largest component of the total costs of production. It is true that a high-wage nation may have a relative cost disadvantage compared with its low-wage trading partner in the production of labor-intensive commodities. But this does not mean that foreign producers can undersell the home country across the board in all lines of production, causing the overall domestic standard of living to decline. Foreign nations should use the revenues from their export sales to purchase the products in which the home country has a competitive advantage—products requiring a large share of the factors of production that are abundant domestically.

Recall that the factor-endowment theory suggests that as economies become interdependent through trade, resource payments tend to become equal in different nations given competitive markets. A nation with expensive labor will tend to import products embodying large amounts of labor. As imports rise and domestic output falls, the resulting decrease in demand for domestic labor will cause domestic wages to fall to the foreign level.

Fairness in Trade: A Level Playing Field

Fairness in trade is another reason given for protectionism. Business firms and workers often argue that foreign governments play by a different set of rules than the home government, giving foreign firms unfair competitive advantages. Domestic producers contend that import restrictions should be enacted to offset these foreign advantages, thus creating a **level playing field** on which all producers can compete on equal terms.

American companies often allege that foreign firms are not subject to the same government regulations regarding pollution control and worker safety; this is especially true in many developing nations (such as Mexico and South Korea) where environmental laws and enforcement have been lax. Moreover, foreign firms may not pay as much in corporate taxes and may not have to comply with employment regulations such as affirmative action, minimum wages, and overtime pay. Also, foreign governments may erect high trade barriers that effectively close their markets to imports or they may subsidize their producers so as to enhance their competitiveness in world markets.

These fair trade arguments are often voiced by organized lobbies that are losing sales to foreign competitors. They may sound appealing to the voters because they are couched in terms of fair play and equal treatment. However, there are several arguments against levying restrictions on imports from nations that have high trade restrictions or that place lower regulatory burdens on their producers.

First, trade benefits the domestic economy even if foreign nations impose trade restrictions. Although foreign restrictions that lessen our exports may decrease our welfare, retaliating by levying our own import barriers—that protect inefficient domestic producers—decreases our welfare even more.

Second, the argument does not recognize the potential impact on global trade. If each nation were to increase trade restrictions whenever foreign restrictions were higher than domestic restrictions, a worldwide escalation in restrictions would occur; this would lead to a lower volume of trade, falling levels of production and employment, and a decline in welfare. There may be a case for threatening to levy trade restrictions unless foreign nations reduce their restrictions, but if negotiations fail and domestic restrictions are employed, the result is undesirable. Other countries' trade practices are seldom an adequate justification for domestic trade restrictions.

Maintenance of the Domestic Standard of Living

Advocates of trade barriers often contend that tariffs are useful in maintaining a high level of income and employment for the home nation. It is argued that by reducing the level of imports, tariffs encourage home spending that stimulates domestic economic activity. As a result, the home nation's level of employment and income will be enhanced.

Although this argument appears appealing on the surface, it merits several qualifications. All nations together cannot levy tariffs to bolster domestic living standards. This is because tariffs result in a redistribution of the gains from trade among nations. To the degree that one nation imposes a tariff that improves its income and employment, it does so at the expense of its trading partners' living standard. Nations adversely affected by trade barriers are likely to impose retaliatory tariffs, resulting in a lower level of welfare for all nations. It is little wonder that tariff restrictions designed to enhance a nation's standard of living at the expense of its trading partner are referred to as *beggar-thy-neighbor* policies.

Equalization of Production Costs

Proponents of a **scientific tariff** seek to eliminate what they consider to be unfair competition from abroad. Owing to such factors as lower wage costs, tax concessions, or government subsidies, foreign sellers may enjoy cost advantages over domestic firms. To offset any such advantage, tariffs equivalent to the cost differential should be imposed. Such provisions were actually part of the U.S. Tariff Acts of 1922 and 1930.

In practice, the scientific tariff suffers from a number of problems. Because costs differ from business to business within a given industry, how can costs actually be compared? Suppose that all U.S. steelmakers were extended protection from all foreign steelmakers.

This protection would require the costs of the most efficient foreign producer to be set equal to the highest costs of the least efficient U.S. company. Given today's cost conditions, prices would certainly rise in the United States. This rise would benefit the more efficient U.S. companies that would enjoy economic profits, but the U.S. consumer would be subsidizing inefficient production. Because the scientific tariff approximates a prohibitive tariff, it completely contradicts the notion of comparative advantage and wipes out the basis for trade and gains from trade.

Infant-Industry Argument

One of the more commonly accepted cases for tariff protection is the **infant-industry argument**. This argument does not deny the validity of the case for free trade. However, it contends that for free trade to be meaningful, trading nations should temporarily shield their newly developing industries from foreign competition. Otherwise, mature foreign businesses that are at the time more efficient can drive the young domestic businesses out of the market. Only after the young companies have had time to become efficient producers should the tariff barriers be lifted and free trade take place.

Although there is some truth in the infant-industry argument, it must be qualified in several respects. First, once a protective tariff is imposed, it is difficult to remove, even after industrial maturity has been achieved. Special interest groups can often convince policymakers that further protection is justified. Second, it is difficult to determine which industries will be capable of realizing comparative-advantage potential and thus merit protection. Third, the infant-industry argument generally is not valid for mature, industrialized nations such as the United States, Germany, and Japan. Fourth, there may be other ways of insulating a developing industry from cutthroat competition. Rather than adopt a protective tariff, the government could grant a subsidy to the industry. A subsidy has the advantage of not distorting domestic consumption and relative prices; its drawback is that instead of generating revenue, as an import tariff does, a subsidy spends revenue.

Noneconomic Arguments

Noneconomic considerations also enter into the arguments for protectionism. One such consideration is *national security*. The national security argument contends that a country may be put in jeopardy in the event of an international crisis or war if it is heavily dependent on foreign suppliers. Even though domestic producers are not as efficient, tariff protection should be granted to ensure their continued existence. A good application of this argument involves the major oil importing nations that saw several Arab nations impose oil boycotts on the West to win support for the Arab position against Israel during the 1973 Middle East conflict. However, the problem is stipulating what constitutes an essential industry. If the term is defined broadly, many industries may be able to win import protection, and then the argument loses its meaning.

The national security argument for protectionism also has implications for foreign investments such as foreign acquisitions of American companies and assets. Although the United States has traditionally welcomed foreign investment, it provides authority to the president to suspend or prohibit any foreign acquisition, merger, or takeover of a U.S. corporation determined to threaten the national security of the United States. Examples of actions generally considered harmful to the security of the United States include the denial of critical technology or key products to the U.S. government or U.S. industry, moving critical technology or key products offshore that are important for national defense or homeland security, and shutting down or sabotaging a critical facility in the United States. Therefore, the U.S. government reviews foreign investment transactions beyond the defense

industrial base, including energy and natural resources, technology, telecommunications, transportation, and manufacturing. Such reviews have become more stringent since the September 11, 2001, terrorist attack against the United States.¹³

Another noneconomic argument is based on *cultural* and *sociological* considerations. New England may desire to preserve small-scale fishing; West Virginia may argue for tariffs on hand-blown glassware on the grounds that these skills enrich the fabric of life; certain products such as narcotics may be considered socially undesirable, and restrictions or prohibitions may be placed on their importation. These arguments constitute legitimate reasons and cannot be ignored. All the economist can do is point out the economic consequences and costs of protection and identify alternative ways of accomplishing the same objective.

In Canada, many nationalists maintain that Canadian culture is too fragile to survive without government protection. The big threat: U.S. cultural imperialism. To keep the Yanks in check, Canada has long maintained some restrictions on sales of U.S. publications and textbooks. By the 1990s, the envelope of Canada's cultural protectionism was expanding. The most blatant example was a 1994 law that levied an 80 percent tax on Canadian ads in Canadian editions of U.S. magazines—in effect, an effort to kill off the U.S. intruders. Without protections for the Canadian media, the cultural nationalists feared that U.S. magazines such as *Sports Illustrated*, *Time*, and *Business Week* could soon deprive Canadians of the ability to read about themselves in *Macleans* and *Canadian Business*. Although U.S. protests of the tax ultimately led to its abolishment, the Canadian government continued to examine other methods of preserving the culture of its people.

Most of the arguments justifying tariffs are based on the assumption that the national welfare, as well as the individual's welfare, will be enhanced. The strategic importance of tariffs for the welfare of import-competing producers is one of the main reasons that reciprocal tariff liberalization has been so gradual. It is no wonder that import-competing producers make such strong and politically effective arguments that increased foreign competition will undermine the welfare of the nation as a whole as well as their own. Although a liberalization of tariff barriers may be detrimental to a particular group, we must be careful to differentiate between the individual's welfare and the national welfare. If tariff reductions result in greater welfare gains from trade and if the adversely affected party can be compensated for the loss it has faced, the overall national welfare will increase. However, proving that the gains more than offset the losses in practice is difficult.

Would a Tariff Wall Really Protect U.S. Jobs?

During the 2016 presidential election, several candidates made trade protectionism a priority in their campaigns. Among the candidates souring on free trade were Hillary Clinton and Bernie Sanders on the Democratic ticket and Donald Trump and Ted Cruz on the Republican ticket. To protect jobs of Americans, they called for increased tariffs on imports and, in some cases, the “ripping up” of U.S. free trade agreements.

However, critics of protectionism often cite Claude Frederic Bastiat, a nineteenth-century French classical liberal theorist, political economist, and member of the French National Assembly. Bastiat maintained that when making laws or economic policies, it is necessary that we consider not only what is seen (the direct effects) but what is unseen (the indirect effects). That is, we must consider the whole picture. And this pertains to import tariffs.

Consider U.S. tariffs as applied to steel imports. Critics argue that although tariffs may result in additional jobs for American steel workers, they do not lead to an overall increase

¹³Edward Graham and David Marchick, *U.S. National Security and Foreign Direct Investment*, Washington, DC: Institute for International Economics, 2006.

in jobs for Americans. Why? The adverse indirect effects of tariffs on job creation offset the positive direct effects of tariffs on job creation. Critics make several arguments to support their position:

- The additional money that U.S. consumers spend on steel, resulting from higher tariffs, reduces their spending on other retail goods, thus lowering employment in these domestic industries.
- Import tariffs on steel result in higher costs, a loss of competitiveness, and job losses for U.S. steel-using industries. These industries use steel to manufacture other products such as automobiles, oil pipelines, appliances, tractors and bulldozers, and buildings. In fact, the vast majority of steel-using manufacturers are small businesses that have little or no influence over the prices at which they can sell the products they make. They are too small to be able to demand that their customers pay more for the products they sell because their input (steel) costs have gone up.
- As tariffs cause foreign producers to sell less steel in the United States, they earn fewer dollars and so must purchase fewer U.S. exports. U.S. export industries must then reduce production which causes layoffs for Americans.
- American steel producers tend to realize a higher price, increased sales, and more jobs due to tariff protection. But from a social perspective, the increase in domestic production allows American steel producers to bid resources (including labor) away from other, more efficient American industries.

Simply put, tariffs on imported steel tend to have a positive, direct effect on jobs for American steel workers. That's why the United Steelworkers union has supported the imposition of tariffs. However, such tariffs can also have less visible, indirect effects that result in job losses for other Americans. Indeed, whether or not import tariffs result in job gains for Americans is a complex issue.¹⁴

INTERNATIONAL TRADE APPLICATION

Petition of the Candle Makers

Free trade advocate Frederic Bastiat presented the French Chamber of Deputies with a devastating satire of protectionists' arguments in 1845. His petition asked that a law be passed requiring people to shut all windows, doors, and so forth so that the candle industry would be protected from the "unfair" competition of the sun. He argued that this would be a great benefit to the candle industry, creating many new jobs and enriching suppliers. Consider the following excerpts from his satire:



We are subjected to the intolerable competition of a foreign rival, who enjoys, it would seem, such superior facilities for the production of light, that he is flooding the domestic market with it at an incredibly low price. From the moment he appears, our sales cease, all consumers turn to him, and a branch of French industry whose ramifications are innumerable is at once reduced to complete stagnation. This rival is no other than the sun.

(continued)

¹⁴Walter Williams, *Steel Tariffs Cost Jobs*, *Triblive*, March 12, 2016; Carpe Diem, *Imposing 266 Percent Tariffs on Chinese Steel Imports will Punish U.S. Manufacturers and Consumers, Not China*, American Enterprise Institute, March 2016; John Miller, "U.S. Steel Tariffs Create a Double-Edged Sword," *The Wall Street Journal*, May 31, 2016; Gary Hufbauer and Sean Lowry, "U.S. Tire Tariffs: Saving Few Jobs at High Cost," *Policy Brief*, Peterson Institute for International Economics, April 2012; and Joseph Francois and Laura Baughman, *The Unintended Consequences of U.S. Steel Import Tariffs*, Trade Partnership Worldwide, LLC, Washington, DC, February 4, 2003.

We ask you to be so good as to pass a law requiring the closing of all windows, dormers, skylights, shutters, curtains, and blinds—in short, all openings, holes, chinks, and fissures through which the light of the sun is wont to enter houses, to the detriment of our industries. By shutting out as much as possible all access to natural light, you create the necessity for artificial light. Is there in France an industry which will not, through some connection with this important object, be benefited by it? If more tallow be consumed, there will arise a necessity for an increase of cattle and sheep. If more oil be consumed, it will cause an increase in the cultivation of the olive tree. Navigation will profit as thousands of vessels would be employed in the

whale fisheries. There is, in short, no market which would not be greatly developed by the granting of our petitions.

Although it is undoubtedly true that the French candle industry would benefit from a lack of sunlight, consumers would obviously not be happy about being forced to pay for light that they could get for free were there no government intervention.

What do you think? In the context of this satire, was Frederic Bastiat a proponent of free trade or protectionism? Why?

Source: Frederic Bastiat, *Economic Sophisms*, edited and translated by Arthur Goddard, New York, D. Van Nostrand, 1964.

The Political Economy of Protectionism

Recent history indicates that increasing dependence on international trade yields uneven impacts across domestic sectors. The United States has enjoyed comparative advantages in such products as agricultural commodities, industrial machinery, chemicals, and scientific instruments. However, some of its industries have lost their comparative advantage and suffered from international trade—among them are apparel and textiles, motor vehicles, electronic goods, basic iron and steel, and footwear. Formulating international trade policy in this environment is difficult. Free trade can yield substantial benefits for the overall economy through increased productivity and lower prices, but specific groups may benefit if government provides them some relief from import competition. Government officials must consider these opposing interests when setting the course for international trade policy.

Considerable attention has been devoted to what motivates government officials when formulating trade policy. As voters, we do not have the opportunity to go to the polls and vote for a trade bill. Instead, formation of trade policy rests in the hands of elected officials and their appointees. It is generally assumed that elected officials form policies to maximize votes and thus remain in office. The result is a bias in the political system that favors protectionism.

The **protection-biased sector** of the economy generally consists of import-competing producers, labor unions representing workers in that industry, and suppliers to the producers in the industry. Seekers of protectionism are often established firms in an aging industry that have lost their comparative advantage. High costs may be due to lack of modern technology, inefficient management procedures, outmoded work rules, or high payments to domestic workers. The **free trade-biased sector** generally comprises exporting companies, their workers, and their suppliers. It also consists of consumers, including wholesalers and retail merchants of imported goods.

Government officials understand that they will likely lose the political support of, say, the United Auto Workers (UAW) if they vote against increases in tariffs on auto imports. They also understand that their vote on this trade issue will not be the key factor underlying the political support provided by many other citizens. Their support can be retained by appealing to them on other issues while voting to increase the tariff on auto imports to maintain UAW support.

The U.S. protection policy is thus dominated by special interest groups that represent producers. Consumers generally are not organized and their losses due to protectionism are widely dispersed, whereas the gains from protection are concentrated among well-organized producers and labor unions in the affected sectors. Those harmed by a protectionist policy absorb individually a small and difficult to identify cost. Many consumers, though they will pay a higher price for the protected product, do not associate the higher price with the protectionist policy and are unlikely to be concerned about trade policy. However, special interest groups are highly concerned about protecting their industries against import competition. They provide support for government officials who share their views and lobby against the election of those who do not. Clearly, government officials seeking reelection will be sensitive to the special interest groups representing producers.

The political bias favoring domestic producers is seen in the tariff escalation effect, discussed earlier in this chapter. Recall that the tariff structures of industrial nations often result in lower import tariffs on intermediate goods and higher tariffs on finished goods. U.S. imports of cotton yarn have traditionally faced low tariffs, while higher tariffs have been applied to cotton fabric imports. The higher tariff on cotton fabrics appears to be the result of the ineffective lobbying efforts of diffused consumers, who lose to organized U.S. fabric producers lobbying for protectionism. But for cotton yarn, the protectionist outcome is less clear. Purchasers of cotton yarn are U.S. manufacturers who want low tariffs on imported inputs. These companies form trade associations and can pressure Congress for low tariffs as effectively as U.S. cotton suppliers, who lobby for high tariffs. Protection applied to imported intermediate goods such as cotton yarn is then less likely.

Not only does the interest of the domestic producer tend to outweigh that of the domestic consumer in trade policy deliberations, but import-competing producers also tend to exert stronger influence on legislators than do export producers. A problem faced by export producers is that their gains from international trade are often in addition to their prosperity in the domestic market; producers that are efficient enough to sell overseas are often safe from foreign competition in the domestic market. Most deliberations on trade policy emphasize protecting imports, and the indirect damage done by import barriers to export producers tends to be spread over many export industries. But import-competing producers can gather evidence of immediate damage caused by foreign competition, including falling levels of sales, profits, and employment. Legislators tend to be influenced by the more clearly identified arguments of import-competing producers and see that a greater number of votes are at stake among their constituents than among the constituents of the export producers.

A Supply and Demand View of Protectionism

The political economy of import protection can be analyzed in terms of supply and demand. Protectionism is supplied by the domestic government, while domestic companies and workers are the source of demand. The supply of protection depends on (1) the costs to society, (2) the political importance of import-competing producers, (3) adjustment costs, and (4) public sympathy.

Enlightened government officials realize that although protectionism provides benefits to domestic producers, society as a whole pays the *costs*. These costs include the losses of consumer surplus because of higher prices and the resulting deadweight losses as import volume is reduced, lost economies of scale as opportunities for further trade are foregone, and the loss of incentive for technological development provided by import competition. The higher the costs of protection to society, the less likely it is that government officials will shield an industry from import competition.

The supply of protectionism is also influenced by the *political importance* of the import-competing industry. An industry that enjoys strong representation in the legislature is in a

favorable position to win import protection. It is more difficult for politicians to disagree with 1 million autoworkers than with 20,000 copper workers. The national security argument for protection is a variant on the consideration of the political importance of an industry. The U.S. coal and oil industries were successful in obtaining a national security clause in U.S. trade law permitting protection if imports threaten to impair domestic security.

The supply of protection also tends to increase when domestic firms and workers face large costs of adjusting to rising import competition (for example, unemployment or wage concessions). This protection is seen as a method of delaying the full burden of *adjustment*.

Finally, as *public sympathy* for a group of domestic businesses or workers increases (if workers are paid low wages and have few alternative work skills), a greater amount of protection against foreign-produced goods tends to be supplied.

On the demand side, factors that underlie the domestic industry's demand for protectionism are (1) comparative disadvantage, (2) import penetration, (3) concentration, and (4) export dependence.

The demand for protection rises as the domestic industry's *comparative disadvantage* intensifies. This is seen in the U.S. steel industry that has vigorously pursued protection against low-cost Japanese and South Korean steel manufacturers in recent decades.

Higher levels of *import penetration* that suggests increased competitive pressures for domestic producers also trigger increased demands for protection. A significant change in the nature of support for protectionism occurred in the late 1960s when the AFL-CIO abandoned its long-held belief in the desirability of open markets and supported protectionism. This shift in the union's position was due primarily to the rapid rise in import penetration ratios that occurred during the 1960s in such industries as electrical consumer goods and footwear.

Another factor that may affect the demand for protection is *concentration* of domestic production. The U.S. auto industry, for example, is dominated by the Big Three. Support for import protection can be financed by these firms without fear that a large share of the benefits of protectionism will accrue to nonparticipating firms. Conversely, an industry that comprises many small producers (meat packing) realizes that a substantial share of the gains from protectionism may accrue to producers who do not contribute their fair share to the costs of winning protectionist legislation. The demand for protection tends to be stronger the more concentrated the domestic industry.

Finally, the demand for protection may be influenced by the degree of *export dependence*. One would expect that companies whose foreign sales constitute a substantial portion of total sales (Boeing) would not be greatly concerned about import protection. Their main fear is that the imposition of domestic trade barriers might invite retaliation overseas that would ruin their export markets.

SUMMARY

1. Even though the free trade argument has strong theoretical justifications, trade restrictions are widespread throughout the world. Trade barriers consist of tariff restrictions and nontariff trade barriers.
2. There are several types of tariffs. A specific tariff represents a fixed amount of money per unit of the imported commodity. An ad valorem tariff is stated as a fixed percentage of the value of an imported commodity. A compound tariff combines a specific tariff with an ad valorem tariff.
3. Concerning ad valorem tariffs, several procedures exist for the valuation of imports. The free-on-board (FOB) measure indicates a commodity's price as it leaves the exporting nation. The cost-insurance-freight (CIF) measure shows the product's value as it arrives at the port of entry.

4. The effective tariff rate tends to differ from the nominal tariff rate when the domestic import-competing industry uses imported resources whose tariffs differ from those on the final commodity. Developing nations have traditionally argued that many advanced nations escalate the tariff structures on industrial commodities to yield an effective rate of protection several times the nominal rate.
5. American trade laws mitigate the effects of import duties by allowing U.S. importers to postpone and prorate over time their duty obligations by means of bonded warehouses and foreign trade zones.
6. The welfare effects of a tariff can be measured by its protective effect, consumption effect, redistributive effect, revenue effect, and terms-of-trade effect.
7. If a nation is small compared with the rest of the world, its welfare necessarily falls by the total amount of the protective effect plus the consumption effect if it levies a tariff on imports. If the importing nation is large relative to the world, the imposition of an import tariff may improve its international terms of trade by an amount that more than offsets the welfare losses associated with the consumption effect and the protective effect.
8. Because a tariff is a tax on imports, the burden of a tariff falls initially on importers, who must pay duties to the domestic government. However, importers generally try to shift increased costs to buyers through price increases. Domestic exporters, who purchase imported inputs subject to tariffs, thus face higher costs and a reduction in competitiveness.
9. Although tariffs may improve one nation's economic position, any gains generally come at the expense of other nations. Should tariff retaliations occur, the volume of international trade decreases, and world welfare suffers. Tariff liberalization is intended to promote freer markets so that the world can benefit from expanded trade volumes and the international specialization of inputs.
10. Tariffs are sometimes justified on the grounds that they protect domestic employment and wages, help create a level playing field for international trade, equate the cost of imported products with the cost of domestic import-competing products, allow domestic industries to be insulated temporarily from foreign competition until they can grow and develop, or protect industries necessary for national security.

KEY CONCEPTS AND TERMS

Ad valorem tariff (p. 115)	Free-on-board (FOB) valuation (p. 116)	Protective effect (p. 130)
Beggar-thy-neighbor policy (p. 135)	Free trade argument (p. 142)	Protective tariff (p. 114)
Bonded warehouse (p. 124)	Free trade-biased sector (p. 150)	Redistributive effect (p. 130)
Compound tariff (p. 115)	Infant-industry argument (p. 147)	Revenue effect (p. 130)
Consumer surplus (p. 127)	Large nation (p. 131)	Revenue tariff (p. 114)
Consumption effect (p. 131)	Level playing field (p. 145)	Scientific tariff (p. 146)
Cost-insurance-freight (CIF) valuation (p. 116)	Nominal tariff rate (p. 118)	Small nation (p. 129)
Customs valuation (p. 116)	Offshore assembly provision (OAP) (p. 121)	Specific tariff (p. 115)
Deadweight loss (p. 131)	Optimal tariff (p. 135)	Tariff (p. 114)
Domestic revenue effect (p. 133)	Outsourcing (p. 121)	Tariff avoidance (p. 122)
Effective tariff rate (p. 118)	Producer surplus (p. 128)	Tariff escalation (p. 120)
Foreign-trade zone (FTZ) (p. 125)	Protection-biased sector (p. 150)	Tariff evasion (p. 122)
		Terms-of-trade effect (p. 133)

STUDY QUESTIONS

- Describe a specific tariff, an ad valorem tariff, and a compound tariff. What are the advantages and disadvantages of each?
- What methods do customs appraisers use to determine the values of commodity imports?
- Under what conditions does a nominal tariff applied to an import product overstate or understate the actual, or effective, protection afforded by the nominal tariff?
- Less developed nations sometimes argue that the industrialized nations' tariff structures discourage the less developed nations from undergoing industrialization. Explain.
- Distinguish between consumer surplus and producer surplus. How do these concepts relate to a country's economic welfare?
- When a nation imposes a tariff on the importation of a commodity, economic inefficiencies develop that detract from the national welfare. Explain.
- What factors influence the size of the revenue, protective, consumption, and redistributive effects of a tariff?
- A nation that imposes tariffs on imported goods may find its welfare improving should the tariff result in a favorable shift in the terms of trade. Explain.
- Which of the arguments for tariffs do you feel are most relevant in today's world?
- Although tariffs may improve the welfare of a single nation, the world's welfare may decline. Under what conditions would this be true?
- What impact does the imposition of a tariff normally have on a nation's terms of trade and volume of trade?
- Suppose that the production of \$1 million worth of steel in Canada requires \$100,000 worth of taconite. Canada's nominal tariff rates for importing these goods are 20 percent for steel and 10 percent for taconite. Given this information, calculate the effective rate of protection for Canada's steel industry.
- Would a tariff imposed on U.S. oil imports promote energy development and conservation for the United States?
- What is meant by the terms *bonded warehouse* and *foreign-trade zone*? How does each of these help importers mitigate the effects of domestic import duties?
- Assume the nation of Australia is "small" and thus unable to influence world price. Its demand and supply schedules for TV sets are shown in Table 4.11. Using graph paper, plot the demand and supply schedules on the same graph.

TABLE 4.11

Demand and Supply: TV Sets (Australia)

Price of TVs	Quantity Demanded	Quantity Supplied
\$500	0	50
400	10	40
300	20	30
200	30	20
100	40	10
0	50	0

- Determine Australia's market equilibrium for TV sets.
 - What are the equilibrium price and quantity?
 - Calculate the value of Australian consumer surplus and producer surplus.
- Under free trade conditions, suppose Australia imports TV sets at a price of \$100 each. Determine the free trade equilibrium, and illustrate graphically.
 - How many TV sets will be produced, consumed, and imported?
 - Calculate the dollar value of Australian consumer surplus and producer surplus.
- To protect its producers from foreign competition, suppose the Australian government levies a specific tariff of \$100 on imported TV sets.
 - Determine and show graphically the effects of the tariff on the price of TV sets in Australia, the quantity of TV sets supplied by Australian producers, the quantity of TV sets demanded by Australian consumers, and the volume of trade.
 - Calculate the reduction in Australian consumer surplus due to the tariff-induced increase in the price of TV sets.

- (3) Calculate the value of the tariff's consumption, protective, redistributive, and revenue effects.
- (4) What is the amount of deadweight welfare loss imposed on the Australian economy by the tariff?
16. Assume that the United States, as a steel-importing nation, is large enough that changes in the quantity of its imports influence the world price of steel. The U.S. supply and demand schedules for steel are illustrated in Table 4.12, along with the overall amount of steel supplied to U.S. consumers by domestic and foreign producers.

TABLE 4.12**Supply and Demand: Tons of Steel (United States)**

Price/Ton	Quantity Supplied (Domestic)	Quantity Supplied (Domestic + Imports)	Quantity Demanded
\$100	0	0	15
200	0	4	14
300	1	8	13
400	2	12	12
500	3	16	11
600	4	20	10
700	5	24	9

Using graph paper, plot the supply and demand schedules on the same graph.

- a. With free trade, the equilibrium price of steel is \$_____ per ton. At this price, _____ tons are purchased by U.S. buyers, _____ tons are supplied by U.S. producers, and _____ tons are imported.
- b. To protect its producers from foreign competition, suppose the U.S. government levies a specific tariff of \$250 per ton on steel imports.
- Show graphically the effect of the tariff on the overall supply schedule of steel.
 - With the tariff, the domestic price of steel rises to \$_____ per ton. At this price, U.S. buyers purchase _____ tons, U.S. producers supply _____ tons, and _____ tons are imported.
 - Calculate the reduction in U.S. consumer surplus due to the tariff-induced price of steel, as well as the consumption, protective, redistribution, and domestic revenue effects. The deadweight welfare loss of the tariff equals \$_____.
 - By reducing the volume of imports with the tariff, the United States forces the price of imported steel down to \$_____. The U.S. terms of trade (improve/worsen), which leads to (an increase/a decrease) in U.S. welfare. Calculate the terms-of-trade effect.
 - What impact does the tariff have on the overall welfare of the United States?

EXPLORING FURTHER

For a presentation of offer curves in the analysis of tariffs, go to *Exploring Further 4.1*, which can be found in **MindTap**.

For a discussion of President Donald Trump's plans to impose tariffs on imported aluminum and steel, go to *Exploring Further 4.2*, which can be found in **MindTap**.

Nontariff Trade Barriers



This chapter considers policies other than tariffs that restrict international trade. Referred to as **nontariff trade barriers (NTBs)**, such measures have been on the rise since the 1960s and have become the most widely discussed topics at recent rounds of international trade negotiations. Although tariffs have come down in recent decades, nontariff trade barriers have multiplied. This is not surprising. After all, the political forces that give rise to high tariffs do not disappear once tariffs are brought down. Instead, they tend to seek protection through other channels.

Nontariff trade barriers encompass a variety of measures. Some have unimportant trade consequences; labeling and packaging requirements can restrict trade but generally only marginally. Other NTBs have significantly affected trade patterns; examples include absolute import quotas, tariff-rate quotas, voluntary export restraints, subsidies, and domestic content requirements.

Absolute Import Quota

The best-known nontariff barrier is the import quota, which limits the total quantity of goods that may enter a country within a given time period. There are two types of import quotas: absolute quota and tariff-rate quota. Both place restrictions on imported goods and are enforced by the department of U.S. Customs and Border Protection at ports of entry throughout the United States.

An **absolute quota** is a physical restriction on the quantity of goods that can be imported during a specific time period, normally a year; the quota generally limits imports to a level below what would occur under free trade conditions. An absolute quota might state that no more than 1 million kilograms of cheese or 20 million kilograms of wheat can be imported during some specific time period. Imports in excess of a specified quota may be held for the

opening of the next quota period by placing them in a bonded warehouse or a foreign trade zone, or they may be exported or destroyed under supervision of the government's customs department. To administer the quota, the government allocates **import licenses** to importers, permitting them to import the product only up to a prescribed limit regardless of market demand.

One way to limit imports is through a **global quota**. This technique permits a specified number of goods to be imported each year, but it does not specify from where the product is shipped or who is permitted to import. When the specified amount has been imported (the quota is filled), additional imports of the product are prevented for the remainder of the year.

However, the global quota becomes unwieldy because of the rush of both domestic importers and foreign exporters to get their goods shipped into the country before the quota is filled. Those who import early in the year get their goods; those who import late in the year may not. Global quotas are plagued by accusations of favoritism against merchants fortunate enough to be the first to capture a large portion of the business.

To avoid the problems of a global quota system, import quotas have usually been allocated to specific countries; this type of quota is known as a **selective quota**. A country might impose a global quota of 30 million apples per year, of which 14 million must come from the United States, 10 million from Mexico, and 6 million from Canada. Customs officials in the importing nation monitor the quantity of a particular good that enters the country from each source; once the quota for that source has been filled, no more goods are permitted to be imported.

Another feature of quotas is that their use may lead to a domestic monopoly of production and higher prices. Because a domestic firm realizes that foreign producers cannot surpass their quotas, it may raise its prices. Tariffs do not necessarily lead to monopoly power because no limit is established on the amount of goods that can be imported into the nation.

Following World War II, absolute quotas were a popular form of protectionism as countries sought to strictly limit the quantity of imports. However, as the world moved toward trade liberalization in the 1960s and 1970s, absolute quotas were removed from international trade in manufactured goods. By the 1990s, absolute quotas were phased out of trade in agricultural goods and replaced by tariff-rate quotas. As we will learn, not only is a tariff-rate quota a less restrictive trade barrier than an absolute quota, but it is easier to negotiate reductions in tariff rates than increases in absolute quotas.

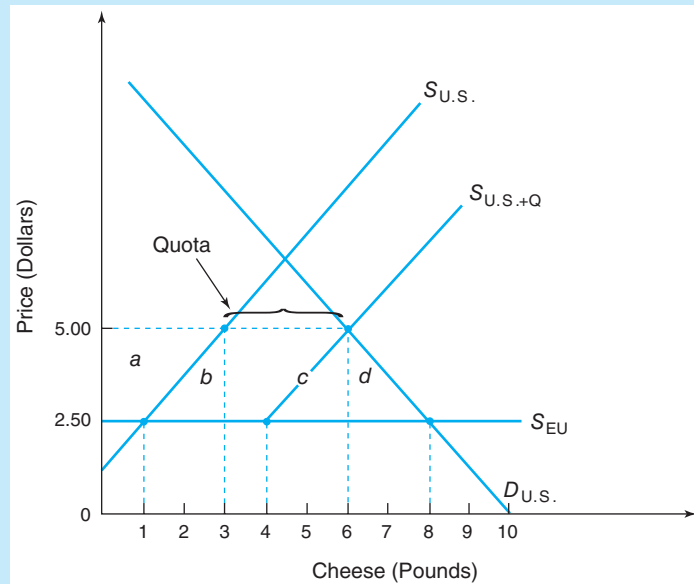
Trade and Welfare Effects

Like a tariff, an absolute quota affects an economy's welfare. Figure 5.1 represents the case of cheese, involving U.S. trade with the European Union (EU). Suppose the United States is a "small" country in terms of the world cheese market. Assume that $S_{U.S.}$ and $D_{U.S.}$ denote the supply and demand schedules for cheese in the United States. The S_{EU} represents the supply schedule of the EU. Under free trade, the price of EU cheese and U.S. cheese equals \$2.50 per pound. At this price, U.S. firms produce 1 pound, U.S. consumers purchase 8 pounds, and imports from the EU total 7 pounds.

Suppose that the United States limits its cheese imports to a fixed quantity of 3 pounds by imposing an import quota. Above the free trade price, the total U.S. supply of cheese now equals U.S. production plus the quota. In Figure 5.1, this is illustrated by a shift in the supply curve from $S_{U.S.}$ to $S_{U.S.+Q}$. The reduction in imports from 7 pounds to 3 pounds raises the

FIGURE 5.1

Import Quota: Trade and Welfare Effects



By restricting available supplies of an imported product, a quota leads to higher import prices. This price umbrella allows domestic producers of the import-competing good to raise prices. The result is a decrease in the consumer surplus. Of this amount, the welfare loss to the importing nation consists of the protective effect, the consumption effect, and that portion of the revenue effect that is captured by the foreign exporter.

equilibrium price to \$5.00; this leads to an increase in the quantity supplied by U.S. firms from 1 pound to 3 pounds and a decrease in the U.S. quantity demanded from 8 pounds to 6 pounds.

Absolute quotas can be analyzed in terms of the same welfare effects identified for tariffs in the preceding chapter. Because the quota in our example results in a price increase to \$5.00 per pound, the U.S. consumer surplus falls by an amount equal to area $a + b + c + d$ (\$17.50). Area a (\$5.00) represents the *redistributive effect*, area b (\$2.50) represents the *protective effect*, and area d (\$2.50) represents the *consumption effect*. The *deadweight loss* of welfare to the economy resulting from the quota is depicted by the protective effect plus the consumption effect.

But what about the quota's *revenue effect*, denoted by area c (\$7.50)? This amount arises from the fact that U.S. consumers must pay an additional \$2.50 for each of the 3 pounds of cheese imported under the quota, as a result of the quota-induced scarcity of cheese. The revenue effect represents a "windfall profit," also known as a "quota rent." The quota rent accrues to whoever has the right to bring imports into the country and sell these goods in the protected market. Where does this windfall profit go?

To determine the distribution of the quota's revenue effect, it is useful to think of a series of exchanges as seen in the following example. Suppose that European exporting companies

sell cheese to grocery stores (importing companies) in the United States, which sell it to U.S. consumers¹:

European exporting companies → U.S. grocery stores (importing companies) → U.S. consumers

The distribution of the quota's revenue effect will be determined by the prices that prevail in the exchanges between these groups. Who obtains this windfall profit will depend on the competitive relation between the exporting and importing companies concerned.

One outcome occurs when European exporting companies are able to collude and in effect become a monopoly seller. If grocers in the United States behave as competitive buyers, they will bid against one another to buy European cheese. The delivered price of cheese will be driven up from \$2.50 to \$5.00 per pound. European exporting companies thus capture the windfall profit of the quota. The windfall profit captured by European exporters becomes a welfare loss for the U.S. economy, in addition to the deadweight losses resulting from the protective and consumption effects.

Instead, suppose that U.S. grocers organize as a single importing company (for example, Safeway grocery stores) and become a monopoly buyer. Also assume that European exporting companies operate as competitive sellers. Now, U.S. importing companies can purchase cheese at the prevailing world price of \$2.50 per pound and resell it to U.S. consumers at a price of \$5.00 per pound. In this case, the quota's revenue effect accrues to the importing companies. Because these companies are American, this accrual does not represent a welfare loss for the U.S. economy.

Alternatively, the U.S. government may collect the quota's revenue effect from the importing companies. Suppose the government sells import licenses to U.S. grocers. By charging for permission to import, the government receives some or all of the quota's windfall profit. If import licenses are auctioned off to the highest bidder in a competitive market, the government will capture all of the windfall profit that would have accrued to importing companies under the quota. Because the quota's revenue effect accrues to the U.S. government, this accrual does not represent a welfare loss for the U.S. economy (assuming that the government returns the revenue to the economy). This point will be discussed further in the next section of this text.

Allocating Quota Licenses

Because an import quota restricts the quantity of imports, usually below the free trade quantity, not all domestic importers can obtain the same number of imports that they could under free trade. Governments thus allocate the limited supply of imports among domestic importers.

In oil and dairy products, at one time the U.S. government issued import licenses on the basis of their historical share of the import market. This method discriminated against importers seeking to import goods for the first time. In other cases, the U.S. government has allocated import quotas on a *pro rata* basis, whereby U.S. importers receive a fraction of their demand equal to the ratio of the import quota to the total quantity demanded collectively by U.S. importers.

Another method of allocating licenses among domestic importers is to auction import licenses to the highest bidder in a competitive market. This technique has been used in Australia and New Zealand. Consider a hypothetical quota on U.S. imports of textiles. The quota pushes the price of textiles in the United States above the world price, making the

¹This example assumes that European exporting companies purchase cheese from European producers who operate in a competitive market. Because each producer is too small to affect the market price, it cannot capture any windfall profit arising under an import quota.

United States an unusually profitable market. Windfall profits can be captured by U.S. importers (for example, Macys and Walmart) if they buy textiles at the lower world price and sell them to U.S. buyers at the higher price made possible because of the quota. Given these windfall profits, U.S. importers would likely be willing to pay for the rights to import textiles. By auctioning import licenses to the highest bidder in a competitive market, the government could capture the windfall profits (the revenue effect shown as area *c* in Figure 5.1). Competition among importers to obtain the licenses would drive up the auction price to a level at which no windfall profits would remain, thus transferring the entire revenue effect to the government. The auctioning of import licenses would turn a quota into something akin to a tariff that generates tax revenue for the government.

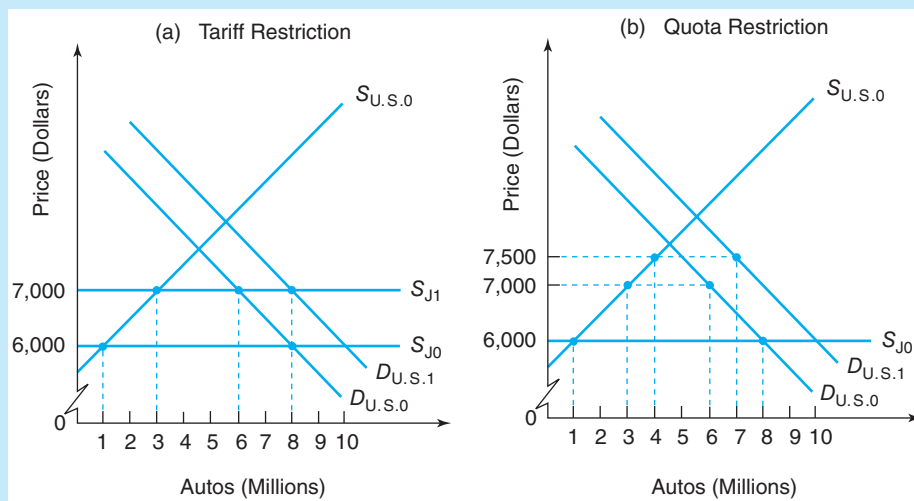
Quotas versus Tariffs

Previous analysis suggests that the revenue effect of absolute quotas differs from that of import tariffs. These two commercial policies can also differ in the impact they have on the volume of trade. The following example illustrates how, during periods of growing demand, an absolute quota restricts the volume of imports by a greater amount than does an equivalent import tariff.

Figure 5.2 represents a hypothetical trade situation for the United States in autos. The U.S. supply and demand schedules for autos are given by $S_{U.S.0}$ and $D_{U.S.0}$, and S_{J_0} represents the Japanese auto supply schedule. Suppose the U.S. government has the option of levying a tariff or a quota on auto imports to protect U.S. companies from foreign competition.

FIGURE 5.2

Trade Effects of Tariffs versus Quotas



In a growing market, an import tariff is a less restrictive trade barrier than an equivalent import quota. With an import tariff, the adjustment that occurs in response to an increase in domestic demand is an increase in the amount of the product that is imported. With an import quota, an increase in demand induces an increase in product price. The price increase leads to a rise in production and a fall in consumption of the import-competing good, while the level of imports remains constant.

In Figure 5.2(a), a tariff of \$1,000 raises the price of Japanese autos from \$6,000 to \$7,000; auto imports would fall from 7 million units to 3 million units. In Figure 5.2(b), an import

quota of 3 million units would put the United States in a trade position identical to that which occurs under the tariff: The quota-induced scarcity of autos results in a rise in the price from \$6,000 to \$7,000. So far, it appears that the tariff and the quota are equivalent with respect to their restrictive impact on the volume of trade.

Now suppose that the U.S. demand for autos rises from $D_{U.S.0}$ to $D_{U.S.1}$. Figure 5.2(a) shows that, despite the increased demand, the price of auto imports remains at \$7,000. This is because the U.S. price cannot differ from the Japanese price by an amount exceeding the tariff duty. Auto imports rise from 3 million units to 5 million units. Under an import tariff, then, domestic adjustment takes the form of an increase in the quantity of autos imported rather than a rise in auto prices.

In Figure 5.2(b), an identical increase in demand induces a rise in domestic auto prices. Under the quota, there is no limit on the extent to which the U.S. price can rise above the Japanese price. Given an increase in domestic auto prices, U.S. companies are able to expand production. The domestic price will rise until the increased production plus the fixed level of imports are commensurate with the domestic demand. Figure 5.2(b) shows that an increase in demand from $D_{U.S.0}$ to $D_{U.S.1}$ forces auto prices up from \$7,000 to \$7,500. At the new price, domestic production equals 4 million units, and domestic consumption equals 7 million units. Imports total 3 million units, the same amount as under the quota before the increase in domestic demand. Adjustment thus occurs in domestic *prices* rather than in the quantity of autos imported.

During periods of growing demand, an absolute quota is a more restrictive trade barrier than an equivalent import tariff. Under a quota, the government arbitrarily limits the quantity of imports. Under a tariff, the domestic price can rise above the world price only by the amount of the tariff; domestic consumers can still buy unlimited quantities of the import if they are willing and able to pay that amount. Even if the domestic industry's comparative disadvantage grows more severe, the quota prohibits consumers from switching to the imported good. Thus, a quota assures the domestic industry a ceiling on imports regardless of changing market conditions.²

A quota is a more restrictive barrier to imports than a tariff. A tariff increases the domestic price, but it cannot limit the number of goods that can be imported into a country. Importers who are successful enough to be able to pay the tariff duty still get the product. Also, a tariff may be offset by the price reductions of a foreign producer that can cut costs or slash profit margins. Tariffs allow for some degree of competition. However, by imposing an absolute limit on the imported good, a quota is more restrictive than a tariff and suppresses competition. The degree of protection provided by a tariff is determined by the market mechanism, but a quota forecloses the market mechanism. Finally, tariffs generate revenue for the government. This is revenue that would be lost to the government under a quota unless it charged a license fee on importers. As a result, member countries of the World Trade Organization (WTO) agreed to eliminate absolute quotas and replace them with tariff-rate quotas and eventually tariffs.

Tariff-Rate Quota: A Two-Tier Tariff

Another type of import quota is the **tariff-rate quota**. The U.S. government has imposed this restriction on imports such as steel, brooms, cattle, fish, sugar, milk, and other agricultural products.

²You might test your understanding of the approach used here by working out the details of two other hypothetical situations: (a) a reduction in the domestic supply of autos caused by rising production costs and (b) a reduction in domestic demand due to economic recession.

A tariff-rate quota displays both tariff-like and quota-like characteristics. This device allows a specified number of goods to be imported at a lower tariff rate (the *within-quota rate*), whereas any imports above this level face a higher tariff rate (the *over-quota rate*). Therefore, there is no absolute limitation on the amount of the product that may be imported during the quota period. In practice, the over-quota tariff rate is often set high enough to prohibit the importation of the product into the domestic market.

A tariff-rate quota has two components: a quota that defines the maximum volume of imports and charges the within-quota tariff; and an over-quota tariff. A tariff-rate quota is a *two-tier tariff*. Tariff-rate quotas are applied for each trade year, and if not filled during a particular year, the market access under the quota is lost. Table 5.1 provides examples of tariff-rate quotas applied to U.S. imports.

TABLE 5.1

Examples of U.S. Tariff-Rate Quotas

Product	Within-Quota Tariff Rate	Import-Quota Threshold	Over-Quota Tariff Rate
Peanuts	\$0.935/kg	30,393 tons	187.9% ad valorem
Beef	\$0.44/kg	634,621 tons	31.1% ad valorem
Milk	\$0.32/L	5.7 million L	\$0.885/L
Blue cheese	\$0.10/kg	2.6 million kg	\$2.60/kg

Source: From U.S. International Trade Commission, *Harmonized Tariff Schedule of the United States*, Washington, DC, U.S. Government Printing Office, 2017.

The tariff-rate quota appears to differ little from the absolute quota discussed earlier in this chapter. The distinction is that under an absolute quota it is legally impossible to import more than a specified amount. In principle, under a tariff-rate quota, imports can exceed this specified amount, but a higher over-quota tariff is applied on the excess. In practice, however, many over-quota tariffs are prohibitively high and effectively exclude imports in excess of the quota.

Concerning the administration of tariff-rate quotas, **license on demand allocation** is the most common technique of enforcement for the quotas. Under this system, licenses are required to import at the within-quota tariff as enforced by the department of U.S. Customs and Border Protection. Before the quota period begins, potential importers are invited to apply for import licenses. If the demand for licenses is less than the quota, the system operates like a first come, first served system. Usually, if demand exceeds the quota, the import volume requested is reduced proportionally among all applicants. Other techniques for allocating quota licenses are historical market share and auctions.

When the WTO was established in 1995 (see Chapter 6), member countries changed their systems of import protection for those agricultural products helped by government farm programs. The WTO requires members to convert to tariffs all nontariff trade barriers (absolute quotas, variable levies, discretionary licensing, outright import bans, etc.) applicable to imports from other members. In other words, it put all nontariff barriers on a common standard—tariff—that any exporter could readily measure and understand. Members are allowed to adopt tariff-rate quotas as a transitional instrument during this conversion period. At the writing of this text, the duration of this conversion period had not been defined. Tariff-rate quotas will likely be around for some time to come. The welfare effects of a tariff-rate quota are discussed in *Exploring Further 5.1*, which can be found in **MindTap**.

Tariff-Rate Quota Bittersweet for Sugar Consumers

The U.S. sugar industry provides an example of the effects of a tariff-rate quota. Traditionally, U.S. sugar growers have received government subsidies in the form of a guaranteed minimum price for sugar. However, this artificially high price can attract lower-priced imported sugar, driving down the price. To prevent this outcome, the U.S. government intervenes in the market a second time by implementing tariff-rate quotas that discourage imported sugar from entering the domestic market.

Tariff-rate quotas for raw cane sugar are allocated on a country-by-country basis among 41 countries in total, while those for refined sugar are allocated on a global first come, first served basis. For sugar entering the U.S. market within the tariff-rate quota, a lower tariff is applied. For sugar imports in excess of the tariff-rate quota, a much higher tariff rate is established that virtually prohibits these imports. In this manner, the tariff-rate quota approximates the trade volume limit of an absolute quota that was discussed earlier in this chapter. However, the U.S. government has the option of establishing higher tariff-rate quota amounts whenever it believes that the domestic supply of sugar may be inadequate to meet domestic demand.

The effect of the tariff-rate quota is to restrict the supply of foreign sugar from entering the United States, thus causing the price of sugar in the domestic market to increase substantially. The U.S. price of sugar has often been almost twice the world market price because of the tariff-rate quota. The world price of sugar averaged \$0.26 per pound in 2013 compared with \$0.43 in the United States. That resulted in higher costs for American food companies and led to higher prices at the grocery store. Therefore, some manufacturers of candies, chocolates, and breakfast cereal, which use substantial amounts of sugar, relocated to Canada and Mexico where sugar prices are much lower. Hershey Foods closed plants in Colorado, California, and Pennsylvania and relocated them to Canada; Brach's moved its Chicago candy production to Mexico. To add to the controversy, analysts estimate that almost half of the sugar program benefits go to only 1 percent of sugar growers. Is protecting a small group of rich sugar barons justified?

The sugar tariff-rate quota is a classic example of concentrated benefits and dispersed costs. The quota provides enormous revenues for a small number of American sugar growers and refiners. However, the costs of providing these benefits are spread across the U.S. economy, specifically to American families as consumers and sugar-using producers such as soft drink companies. The U.S. government's trade policy for sugar is "bittersweet" for American consumers.³

Export Quotas

Besides implementing import quotas, countries have used **export quotas** to restrain trade. When doing so, they typically negotiate a market sharing pact known as a voluntary export restraint agreement, also known as an orderly marketing agreement. The agreement's main purpose is to moderate the intensity of international competition, allowing less efficient domestic producers to participate in markets that would otherwise have been lost to foreign producers that sell a superior product at a lower price. Japan may impose quotas on its steel

³Bryan Riley, *Abolish the Costly Sugar Program to Lower Sugar Prices*, The Heritage Foundation, December 5, 2012; U.S. International Trade Commission, *The Economic Effects of Significant U.S. Import Restraints*, Washington, DC, 2011; and Mark Groombridge, *America's Bittersweet Sugar Policy*, Cato Institute, Washington, DC, December 4, 2001.

exports to Europe, or Taiwan may agree to cutbacks on textile exports to the United States. The export quotas are voluntary in the sense that they are an alternative to more stringent trade restraints that might be imposed by an importing nation. Although voluntary export quotas governed trade in television sets, steel, textiles, autos, and ships during the 1980s, recent international trade agreements have prevented further use of this trade restriction.

Voluntary export quotas tend to have identical economic effects to equivalent import quotas, except being implemented by the exporting nation. The revenue effect of an export quota is captured by the foreign exporting company or its government. The welfare effects of an export quota are further examined in *Exploring Further 5.2*, which can be found in **MindTap**.

An analysis of the major U.S. voluntary export restraint agreements of the 1980s (automobiles, steel, and textiles and apparel) concluded that about 67 percent of the costs to American consumers of these restraints was captured by foreign exporters as profit.⁴ From the viewpoint of the U.S. economy as a whole, voluntary export restraints tend to be more costly than tariffs. Let us consider a voluntary export restraint agreement from the 1980s.

Japanese Auto Restraints Put Brakes on U.S. Motorists

In 1981, as domestic auto sales fell, protectionist sentiment gained momentum in the U.S. Congress, and legislation was introduced calling for import quotas. This momentum was a major factor in the Reagan administration's desire to negotiate a voluntary restraint pact with the Japanese. Japan's acceptance of this agreement was apparently based on its view that voluntary limits on its auto shipments would derail any protectionist momentum in Congress for more stringent measures.

The restraint program called for self-imposed export quotas on Japanese auto shipments to the United States for three years, beginning in 1981. First-year shipments were to be held to 1.68 million units, 7.7 percent below the 1.82 million units exported in 1980. The quotas were extended annually with some upward adjustment in the volume numbers, until 1984.

The purpose of the export agreement was to help U.S. automakers by diverting U.S. customers from Japanese to U.S. showrooms. As domestic sales increased, so would jobs for American autoworkers. It was assumed that Japan's export quota would assist the U.S. auto industry as it went through a transition period of reallocating production toward smaller, more fuel-efficient autos and adjusting production to become more cost competitive.

Not all Japanese auto manufacturers were equally affected by the export quota. By requiring Japanese auto companies to form an export cartel against the U.S. consumer, the quota allowed the large, established firms (Toyota, Nissan, and Honda) to increase prices on autos sold in the United States. To derive more revenues from a limited number of autos, Japanese firms shipped autos to the United States with fancier trim, bigger engines, and more amenities such as air conditioners and deluxe stereos as standard equipment. Product enrichment also helped the Japanese broaden their hold on the U.S. market and enhance the image of their autos. As a result, the large Japanese manufacturers earned record profits in the United States. However, the export quota was unpopular with smaller Japanese automakers, such as Suzuki and Isuzu, that felt that the quota allocation favored large producers over small producers.

⁴David Tarr, *A General Equilibrium Analysis of the Welfare and Employment Effects of U.S. Quotas in Textiles, Autos, and Steel*, Washington, DC, Federal Trade Commission, 1989.

The biggest loser was the U.S. consumer who had to pay an extra \$660 for each Japanese auto purchased and an extra \$1,300 for each American-made auto in 1984. From 1981 to 1984, U.S. consumers paid an additional \$15.7 billion to purchase autos because of the quota. Although the quota saved some 44,000 jobs for American autoworkers, the consumer cost per job saved was estimated to be more than \$100,000.⁵

By 1985, Toyota, Honda, and Nissan had established manufacturing plants in the United States. This result had been sought by the United Auto Workers (UAW) and the U.S. auto companies. Their view was that taking such action, the Japanese would have to hire American workers and would also face the same competitive manufacturing conditions as U.S. auto companies. Things did not turn out the way that the American auto interests anticipated. When manufacturing in the U.S. market, the Japanese companies adjusted their production and developed new vehicles specifically designed for this market. Although their exports did decrease, vehicles produced at the Japanese transplant factories more than filled the market gap so that the U.S. producers' share of the market declined. Moreover, the UAW was unsuccessful in organizing workers at most transplant factories, and therefore, the Japanese were able to continue to keep labor costs down.

Domestic Content Requirements

Today, many products such as autos and aircraft embody worldwide production. Domestic manufacturers of these products purchase resources or perform assembly functions outside the home country—a practice known as outsourcing or production sharing. General Motors obtains engines from its subsidiaries in Mexico, Chrysler purchases ball joints from Japanese producers, and Ford acquires cylinder heads from European companies. Firms have used outsourcing to take advantage of lower production costs overseas, including lower wage rates. Domestic workers often challenge this practice, maintaining that outsourcing means that cheap foreign labor takes away their jobs and imposes downward pressure on the wages of those workers who are able to keep their jobs. Countries that have used domestic content requirements include Argentina, Mexico, Brazil, Uruguay, China, and others.⁶

To limit the practice of outsourcing, organized labor has lobbied for the use of **domestic content requirements**. These requirements stipulate the minimum percentage of a product's total value that must be produced domestically if the product is to qualify for zero tariff rates. The effect of content requirements is to pressure both domestic and foreign firms that sell products in the home country to use domestic inputs (workers) in the production of those products. The demand for domestic inputs thus increases, contributing to higher input prices. Manufacturers generally lobby against domestic content requirements because they prevent manufacturers from obtaining inputs at the lowest cost, thereby contributing to higher product prices and loss of competitiveness.

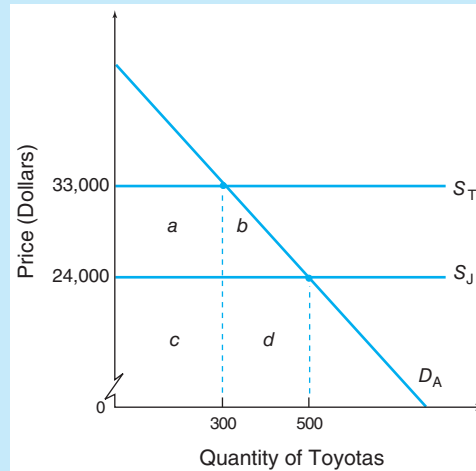
Figure 5.3 illustrates possible welfare effects of an Australian content requirement on automobiles. Assume that D_A denotes the Australian demand schedule for Toyota automobiles, while S_J depicts the supply price of Toyotas exported to Australia: \$24,000.

⁵U.S. International Trade Commission, *A Review of Recent Developments in the U.S. Automobile Industry Including an Assessment of the Japanese Voluntary Restraint Agreements*, Washington, DC, Government Printing Office, 1985.

⁶See U.S. Department of Commerce, International Trade Administration, Office of Automotive Affairs, *Compilation of Foreign Motor Vehicle Import Requirements* at <http://trade.gov>.

FIGURE 5.3

Welfare Effects of a Domestic Content Requirement



A domestic content requirement leads to rising production costs and prices to the extent that manufacturers are “forced” to locate production facilities in a high-cost nation. Although the content requirement helps preserve domestic jobs, it imposes welfare losses on domestic consumers.

With free trade, Australia imports 500 Toyotas. Japanese resource owners involved in manufacturing this vehicle realize incomes totaling \$12 million, denoted by area $c + d$.

Suppose the Australian government imposes a domestic content requirement on autos. This policy causes Toyota to establish a factory in Australia to produce vehicles replacing the Toyotas previously imported by Australia. Assume that the transplant factory combines Japanese management with Australian resources (labor and materials) in vehicle production. Also assume that high Australian resource prices (wages) cause the transplant’s supply price to be \$33,000, denoted by S_T . Under the content requirement, Australian consumers demand 300 vehicles. Because production has shifted from Japan to Australia, Japanese resource owners lose \$12 million in income. Australian resource owners gain \$9.9 million in income (area $a + c$) minus the income paid to Japanese managers and the return to Toyota’s capital investment (factory) in Australia.

However, the income gains of Australian resource owners inflict costs on Australian consumers. Because the content requirement causes the price of Toyotas to increase by \$9,000, the Australian consumer surplus decreases by area $a + b$ (\$3.6 million). Of this amount, area b (\$900,000) is a deadweight welfare loss for Australia. Area a (\$2.7 million) is the consumer cost of employing higher-priced Australian resources instead of lower-priced Japanese resources; this amount represents a redistribution of welfare from Australian consumers to Australian resource owners. Similar to other import restrictions, content requirements lead to the subsidizing by domestic consumers of the domestic producer.

INTERNATIONAL TRADE APPLICATION

How American Is Your Car?

Did you know that U.S. buyers of cars and light trucks can learn how American or foreign their new vehicle is? The American Automobile Labeling Act (AALA), passed in 1994, requires content labels on cars and trucks weighing 8,500 pounds or less, telling buyers where the parts of the vehicle were made.

Content is measured by the dollar value of components, not the labor cost of assembling vehicles. The percentages of North American (U.S. and Canadian) and foreign parts must be listed as an average for each



car line. Manufacturers are free to design the label, which can be included on the price sticker or fuel economy sticker or can be separate.

Detroit's Big Three automakers happened to own a number of auto and component plants just northwest of Detroit in Ontario. Subtract the Canadian content, and many Detroit cars became a lot less "American."

Table 5.2 provides examples of the North American content of vehicles sold in the United States for the 2017 model year.

TABLE 5.2

North American Content of Automobiles Sold in the United States

Vehicle	Final Assembly Location	North American Parts Content
Toyota Camry	Georgetown, Kentucky	75%
Buick Enclave	Lansing, Michigan	71
Honda Accord	Marysville, Ohio	70
Ford F-150	Dearborn, Michigan	70
Dodge Durango	Detroit, Michigan	62
Chevrolet Malibu	Kansas City, Kansas	56
Toyota Highlander	Princeton, Indiana	60
Tesla Model S	Freemont, California	50

Source: National Highway Traffic Safety Administration, "2017 AALA Listing," available at www.nhtsa.gov.

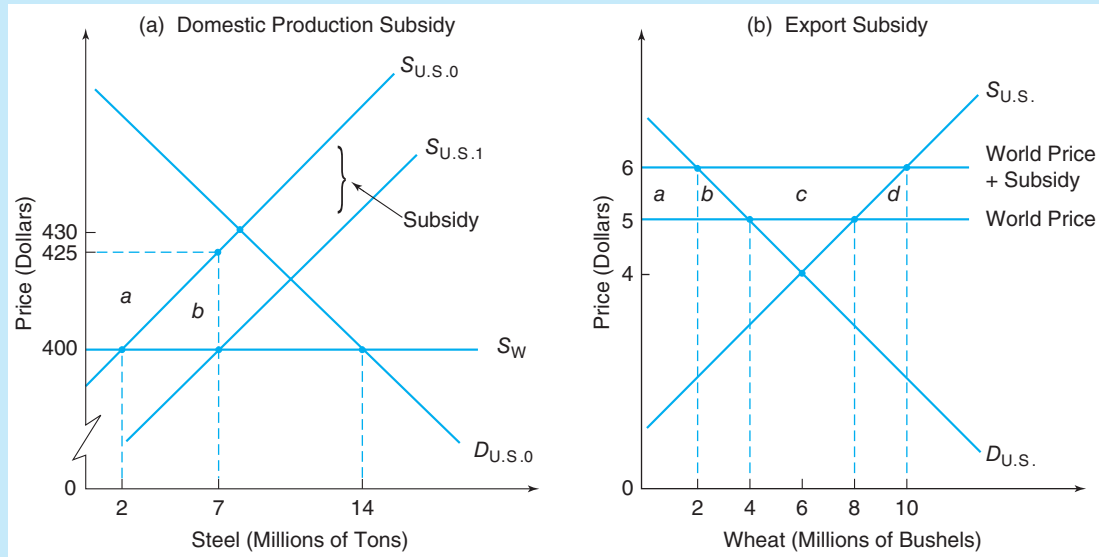
Subsidies

National governments sometimes grant **subsidies** to their producers to help improve their market position. By providing domestic firms a cost advantage, a subsidy allows them to market their products at prices lower than warranted by their actual cost or profit considerations. Governmental subsidies assume a variety of forms, including outright cash disbursements, tax concessions, insurance arrangements, and loans at below-market interest rates.

For purposes of our discussion, two types of subsidies can be distinguished: a **domestic production subsidy** that is granted to producers of import-competing goods; and an **export subsidy** that goes to producers of goods that are to be sold overseas. In both cases, the government adds an amount to the price the purchaser pays rather than subtracting from it. The net price actually received by the producer equals the price paid by the purchaser plus the subsidy. The subsidized producer is thus able to supply a greater quantity at this price. Let us use Figure 5.4 to analyze the effects of these two types of subsidies.

FIGURE 5.4

Trade and Welfare Effects of Subsidies



A government subsidy granted to import-competing producers leads to increased domestic production and reduced imports. The subsidy revenue accruing to the producer is absorbed by producer surplus and high-cost production (protective effect). A subsidy granted to exporters allows them to sell their products abroad at prices below their costs. However, it entails a deadweight welfare loss to the home country in the form of the protective effect and the consumption effect.

Domestic Production Subsidy

If a country decides that the public welfare necessitates the maintenance of a semiconductor industry or aircraft industry, would it not be better just to subsidize it directly, rather than preventing imports of a product? The purpose of a domestic production subsidy is to encourage the output and thus vitality of import-competing producers.

Figure 5.4(a) illustrates the trade and welfare effects of a production subsidy granted to import-competing producers. Assume that the initial supply and demand schedules for steel in the United States are depicted by curves $S_{U.S.0}$ and $D_{U.S.0}$, so that the market equilibrium price is \$430 per ton. Assume also that, because the United States is a small buyer of steel, changes in its purchases do not affect the world price of \$400 per ton. Given a free trade price of \$400 per ton, the United States consumes 14 million tons of steel, produces 2 million tons, and imports 12 million tons.

To partially insulate domestic producers from foreign competition, suppose the U.S. government grants them a production subsidy of \$25 per ton of steel. The cost advantage made possible by the subsidy results in a shift in the U.S. supply schedule from $S_{U.S.0}$ to $S_{U.S.1}$. Domestic production expands from 2 to 7 million tons, and imports fall from 12 to 7 million tons. These changes represent the subsidy's trade effect.

The subsidy also affects the national welfare of the United States. According to Figure 5.4(a), the subsidy permits U.S. output to rise to 7 million tons. At this output, the

net price to the steelmaker is \$425—the sum of the price paid by the consumer (\$400) plus the subsidy (\$25). To the U.S. government, the total cost of protecting its steelmakers equals the amount of the subsidy (\$25) times the amount of output to which it is applied (7 million tons), or \$175 million.

Where does this subsidy revenue go? Part of it is redistributed to the more efficient U.S. producers in the form of a *producer surplus*. This amount is denoted by area *a* (\$112.5 million) in the figure. There is also a *protective effect*, whereby more costly domestic output is allowed to be sold in the market as a result of the subsidy. This effect is denoted by area *b* (\$62.5 million) in the figure. To the United States as a whole, the protective effect represents a deadweight loss of welfare.

To encourage production by its import-competing producers, a government might levy tariffs or quotas on imports. Tariffs and quotas involve larger sacrifices in national welfare than occur under an equivalent subsidy. Unlike subsidies, tariffs and quotas distort choices for domestic consumers (resulting in a decrease in the domestic demand for imports) in addition to permitting less efficient home production to occur. The result is the familiar consumption effect of protection, whereby a deadweight loss of the consumer surplus is borne by the home nation. This welfare loss is absent in the subsidy case. A subsidy tends to yield the same result for domestic producers as does an equivalent tariff or quota, but at a *lower* cost in terms of the nation's welfare.

However, subsidies are not free goods because they must be financed by someone. The direct cost of the subsidy is a burden that must be financed out of tax revenues paid by the public. Moreover, when a subsidy is given to an industry it is often in return for accepting government conditions on key matters (such as wage and salary levels). Therefore, a subsidy may not be as superior to other types of commercial policies as this analysis suggests.

Export Subsidy

Rather than granting a production subsidy to import-competing producers, a government could pay a subsidy on exports only. The most common product groups on which export subsidies are applied are agricultural and dairy products.

Figure 5.4(*b*) shows the effects of an export subsidy. Assume that the supply and demand curves of the United States for wheat are shown by curves $S_{U.S.}$ and $D_{U.S.}$, so the autarky equilibrium price is \$4 per bushel. Assume also that because the United States is a relatively small producer of wheat, changes in its output do not affect the world price. At the world price of \$5 per bushel, the United States produces 8 million bushels, purchases 4 million bushels, and thus exports 4 million bushels.

Suppose that the U.S. government makes a payment of \$1 on each bushel of wheat exported in order to encourage export sales. The subsidy allows U.S. exporting firms to receive revenue of \$6 per bushel that is equal to the world price (\$5) plus the subsidy (\$1). Although the subsidy is not available on domestic sales, these firms are willing to sell to domestic consumers only at the higher price of \$6 per bushel. This is because the firms would not sell wheat in the United States for a price less than \$6 per bushel; they could always earn that amount on sales to the rest of the world. As the price rises from \$5 to \$6 per bushel, the quantity purchased in the United States falls from 4 million bushels to 2 million bushels, the quantity supplied rises from 8 million bushels to 10 million bushels, and the quantity of exports increases from 4 million bushels to 8 million bushels.

The welfare effects of the export subsidy on the U.S. economy can be analyzed in terms of the consumer and producer surpluses. The export subsidy results in a decrease in the consumer surplus of area *a* + *b* in the figure (\$3 million) and an increase in the producer surplus of area *a* + *b* + *c* (\$9 million). The taxpayer cost of the export subsidy equals the per unit subsidy (\$1) times the quantity of wheat exported (8 million bushels), resulting in

area $b + c + d$ (\$8 million). Thus, U.S. wheat producers gain at the expense of the U.S. consumer and taxpayer.

The export subsidy entails a deadweight loss of welfare to the U.S. economy. This consists of area d (\$1 million), which is a deadweight loss because of the increasing domestic cost of producing additional wheat, and area b (\$1 million), which is lost consumer surplus because the price has increased.

In this example, we assumed that the exporting country is a relatively small country. In the real world, the exporting country may be a relatively large producer in the world market, and will realize a decrease in its terms of trade when it imposes a subsidy on exports. Why would this occur? In order to export more product, firms would have to reduce the price. A decrease in the price of the exported good would worsen the exporting country's terms of trade.

The Export Enhancement Program provides an example of the use of export subsidies by the United States. Established in 1985, this program attempts to offset the adverse effects on U.S. agricultural exports because of unfair trade practices or subsidies by competing exporters, particularly the EU. This program allows U.S. exporters to sell their products in targeted markets at prices below their costs by providing cash bonuses. It has played a major role in the export of many agricultural products such as wheat, barley, poultry, and dairy products.

Dumping

The case for protecting import-competing producers from foreign competition is bolstered by the antidumping argument. **Dumping** is recognized as a form of international price discrimination. Dumping occurs when foreign buyers are charged lower prices than domestic buyers for an identical product, after allowing for transportation costs and tariff duties. Selling in foreign markets at a price below the cost of production is also considered dumping.

Forms of Dumping

Commercial dumping is generally viewed as sporadic, predatory, or persistent in nature. Each type is practiced under different circumstances.

Sporadic dumping (distress dumping) occurs when a firm disposes of excess inventories on foreign markets by selling abroad at lower prices than at home. This form of dumping may be the result of misfortune or poor planning by foreign producers. Unforeseen changes in supply and demand conditions can result in excess inventories and thus in dumping. Although sporadic dumping may be beneficial to importing consumers, it can be quite disruptive to import-competing producers who face falling sales and short-run losses. Temporary tariff duties can be levied to protect home producers, but because sporadic dumping has minor effects on international trade, governments are reluctant to grant tariff protection under these circumstances.

Predatory dumping occurs when a producer temporarily reduces the prices charged abroad to drive foreign competitors out of business. When the producer succeeds in acquiring a monopoly position, prices are then raised commensurate with its market power. The new price level must be sufficiently high to offset any losses that occurred during the period of cutthroat pricing. The firm would presumably be confident in its ability to prevent the entry of potential competitors long enough for it to enjoy economic profits. To be successful, predatory dumping has to be practiced on a massive basis to provide consumers with sufficient opportunity for bargain shopping. Home governments are generally concerned about predatory pricing for monopolizing purposes and may retaliate with antidumping duties that eliminate the price differential. Although predatory dumping is a theoretical possibility, economists have not found empirical evidence that supports its

existence. With the prospect of a long and costly period of predation and the likelihood of a limited ability to deter subsequent entry by new rivals, the chances of actually earning full monopoly profits seem remote.

Persistent dumping, as its name suggests, goes on indefinitely. In an effort to maximize economic profits, a producer may consistently sell abroad at lower prices than at home. The rationale underlying persistent dumping is explained in the next section.

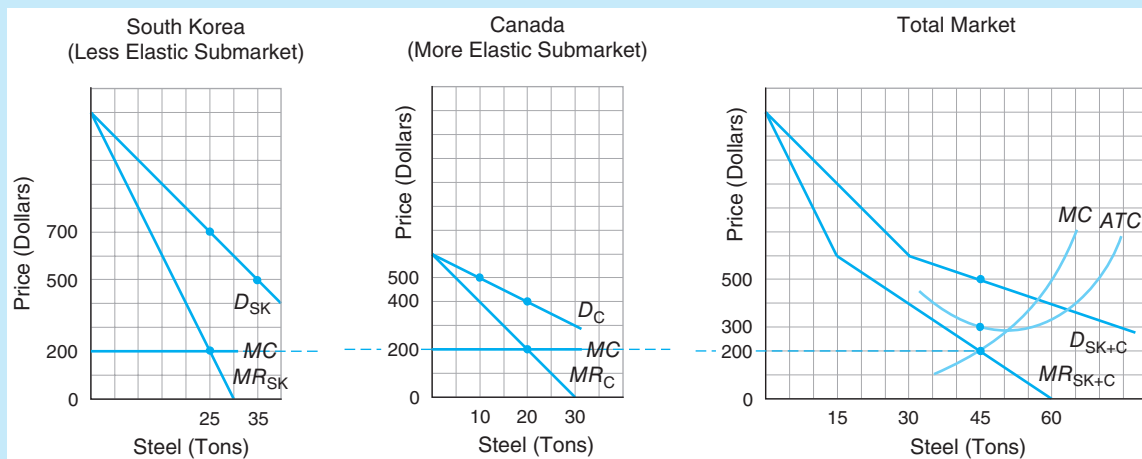
International Price Discrimination

Consider the case of a domestic seller that enjoys market power as a result of barriers that restrict competition at home. Suppose this firm sells in foreign markets that are highly competitive. This scenario means that the domestic consumer response to a change in price is less than that abroad; the home demand is less elastic than the foreign demand. A profit-maximizing firm would benefit from international price discrimination, charging a *higher* price at home, where competition is weak and demand is less elastic, and a *lower* price for the same product in foreign markets to meet competition. The practice of identifying separate groups of buyers of a product and charging different prices to these groups results in increased revenues and profits for the firm as compared to what would occur in the absence of price discrimination.

Figure 5.5 illustrates the demand and cost conditions of South Korean Steel Inc. (SKS) that sells steel to buyers in South Korea (less elastic market) and in Canada (more elastic market); the total steel market consists of these two submarkets. Let D_{SK} be the South Korean steel demand and D_C be the Canadian demand, with the corresponding marginal revenue schedules represented by MR_{SK} and MR_C , respectively. The D_{SK+C} denotes the market demand schedule, found by adding horizontally the demand schedules of the two submarkets; similarly, MR_{SK+C} represents the market marginal revenue schedule.

FIGURE 5.5

International Price Discrimination



A price-discriminating firm maximizes profits by equating marginal revenue, in each submarket, with marginal cost. The firm will charge a higher price in the less elastic demand (less competitive) market and a lower price in the more elastic demand (more competitive) market. Successful dumping leads to additional revenue and profits for the firm compared to what would be realized in the absence of dumping.

The marginal cost and average total cost schedules of SKS are denoted respectively by MC and ATC .⁷

SKS maximizes total profits by producing and selling 45 tons of steel, at which marginal revenue equals marginal cost. At this output level, ATC equals \$300 per ton, and total cost equals \$13,500 ($\300×45 tons). The firm faces the problem of how to distribute the total output of 45 tons and set price in the two submarkets in which it sells. Should the firm sell steel to South Korean and Canadian buyers at a uniform (single) price, or should the firm practice discriminating pricing?

As a *nondiscriminating* seller, SKS sells 45 tons of steel to South Korean and Canadian buyers at the single price of \$500 per ton, the maximum price permitted by demand schedule D_{SK+C} at the $MR = MC$ output level. To see how many tons of steel are sold in each submarket, construct a horizontal line in Figure 5.5 at the price of \$500. The optimal output in each submarket occurs where the horizontal line intersects the demand schedules of the two nations. Thus, SKS sells 35 tons of steel to South Korean buyers at \$500 per ton and receives revenues totaling \$17,500. The firm sells 10 tons of steel to Canadian buyers at \$500 per ton and realizes revenue of \$5,000. Sales revenues in both submarkets combined equal \$22,500. With a total cost of \$13,500, SKS realizes a profit of \$9,000.

Although SKS realizes a profit as a nondiscriminating seller, its profits are not optimal. By engaging in price discrimination, the firm can increase its total revenues without increasing its costs, and thus increase its profits. The firm accomplishes this by charging *higher* prices to South Korean buyers, who have less elastic demand schedules, and *lower* prices to Canadian buyers, who have more elastic demand schedules.

As a price-discriminating seller, SKS again faces the problem of how to distribute the total output of 45 tons of steel and set price in the two submarkets in which it sells. To accomplish this, the firm follows the familiar $MR = MC$ principle, whereby the marginal revenue of each submarket equals the marginal cost at the profit-maximizing output. This principle can be shown in Figure 5.5 by first constructing a horizontal line from \$200, the point where $MC = MR_{SK+C}$. The optimal output and price in each submarket is then found where this horizontal line intersects the MR schedules of the submarkets. SKS sells 25 tons of steel to South Korean buyers at a price of \$700 per ton and receives revenues totaling \$17,500. The firm sells 20 tons of steel to Canadian buyers at a price of \$400 per ton and collects revenues of \$8,000. The combined revenues of the two submarkets equal \$25,500, a sum \$3,000 greater than in the absence of price discrimination. With a total cost of \$13,500, the firm realizes a profit of \$12,000, compared to \$9,000 under a single pricing policy. As a price-discriminating seller, SKS thus enjoys a higher revenue and profit.

Notice that the firm took advantage of its ability to price discriminate, charging different prices in the two submarkets: \$700 per ton to South Korean steel buyers and \$400 per ton to Canadian buyers. For international price discrimination to be successful, certain conditions must hold. First, to ensure that at any price the demand schedules in the two submarkets have different demand elasticities, the submarkets' demand conditions must differ. Domestic

⁷Figure 5.5 provides an intuitive approach to dumping in that it assumes that South Korea's demand curve for steel is less elastic than Canada's demand curve, without reference to specific prices on the respective curves. Actually, elasticity generally varies along a demand curve because the percentage response by buyers to a given percentage change in price will depend upon the initial price. A more sophisticated explanation of dumping would be that South Korean Steel Inc., which has market power, initially sells or considers selling steel in South Korea and Canada at an identical price. However, the firm determines that at this price, the price elasticity of the Canadian demand exceeds that of the South Korean demand. Thus, the firm is motivated to charge a lower price in Canada to take advantage of the different price sensitivities—that is, to practice dumping. See William Rieber, "A Note on the Teaching of Dumping in International Economics Textbooks," *The American Economist*, 55, No. 2, Fall 2010.

buyers, for example, may have income levels or tastes and preferences that differ from those of the buyers abroad. Second, the firm must be able to separate the two submarkets, preventing any significant resale of commodities from the lower-priced to the higher-priced market. This is because any resale by consumers will tend to neutralize the effect of differential prices and narrow the discriminatory price structure to the point at which it approaches a single price to all consumers. Because of high transportation costs and governmental trade restrictions, markets are often easier to separate internationally than nationally.

INTERNATIONAL TRADE APPLICATION

Avoiding Antidumping Duties: U.S.–Mexico Sugar Agreement

The North American Free Trade Agreement (NAFTA) of 1995 was designed to abolish most of the trade barriers among the United States, Canada, and Mexico within a 15-year time period. In 2008, the last restrictions on Mexican sugar exports to the United States were eliminated, resulting in an open border for bilateral sugar trade. This was an historic event given that no other sugar-producing country had such unrestricted access to America's market.



However, in 2014, American sugar growers launched a campaign to restore trade restrictions on sugar imports. They complained that Mexican sugar exports were being subsidized by Mexico's government and dumped into the U.S. market at artificially low prices, causing economic injury to American growers.

The U.S. Department of Commerce and the U.S. International Trade Commission subsequently found that Mexican sugar growers were subsidized and dumped in a manner that threatened material injury to American growers. Therefore, punitive tariffs were placed against Mexican sugar entering the United States. The Commerce Department recommended antisubsidy tariffs on Mexican sugar of up to 17.01 percent, and antidumping tariffs ranging from 39.54 percent to 47.26 percent. What made this policy ironic was that the United States was as guilty as Mexico of subsidizing sugar growers.

Fearing that these tariffs might block access to America's sugar market, Mexico decided to minimize its

losses by agreeing to reduce exports to America in exchange for the termination of the tariffs. The sugar agreement with the United States included restrictions on both the price and quantity of imports from Mexico. Sugar was allowed to be imported into the United States if it was priced above certain levels; for example, 20.75 cents per pound for raw sugar and 23.75 cents per pound for refined sugar. Also, quantity restrictions on imports were imposed, as were restrictions on the timing of import arrivals.

Who were the likely winners and losers from the sugar agreement? The U.S. sugar industry got what it desired in that both price and quantity were constrained in a manner that kept the American sugar market insulated from the world. Therefore, U.S. sugar growers could continue to realize high profits. As for Mexico, it got a portion of what it wanted. Although Mexican sugar growers no longer enjoyed the open access to the U.S. market that was negotiated under NAFTA, they dodged being completely shut out of their most important export market. Finally, anyone who purchased sugar in the United States paid a higher price than it was worth in the outside world. This included not only consumers but also producers that use sugar as an input, like bakers and soft drink companies. Indeed, they were not pleased about the U.S.–Mexico sugar agreement.

What do you think? Do you feel that the antidumping duties placed on Mexican sugar provided overall benefits to the United States?

Antidumping Regulations

Despite the benefits that dumping may offer to importing consumers, governments have often levied penalty duties against commodities they believe are being dumped into their markets from abroad. U.S. antidumping law is designed to prevent price discrimination and below-cost sales that injure U.S. industries. Under U.S. law, an **antidumping duty** is levied when the U.S. Department of Commerce determines a class or kind of foreign

merchandise is being sold at *less than fair value* (LTFV) and the U.S. International Trade Commission (ITC) determines that LTFV imports are causing or threatening material injury (such as unemployment and lost sales and profits) to a U.S. industry. Such anti-dumping duties are imposed in addition to the normal tariff in order to neutralize the effects of price discrimination or below-cost sales.

The **margin of dumping** is calculated as the difference between the foreign market value and the U.S. price. Foreign market value is defined in one of two ways. According to the **priced-based definition**, dumping occurs whenever a foreign company sells a product in the U.S. market at a price below that for which the same product sells in the home market. When a home nation price of the good is not available (if the good is produced only for export and is not sold domestically), an effort is made to determine the price of the good in a third market.

In cases where the price-based definition cannot be applied, a **cost-based definition** of foreign market value is permitted. Under this approach, the Commerce Department “constructs” a foreign market value equal to the sum of (1) the cost of manufacturing the merchandise, (2) general expenses, (3) profit on home market sales, and (4) the cost of packaging the merchandise for shipment to the United States. The amount for general expenses must equal at least 10 percent of the cost of manufacturing, and the amount for profit must equal at least 8.0 percent of the manufacturing cost plus general expenses.

Antidumping cases begin with a complaint filed concurrently with the Commerce Department and the International Trade Commission. The complaint comes from within an import-competing industry (from a firm or labor union) and consists of evidence of the existence of dumping and data that demonstrate material injury or threat of injury.

The Commerce Department first makes a preliminary determination as to whether or not dumping has occurred, including an estimate of the size of the dumping margin. If the preliminary investigation finds evidence of dumping, U.S. importers must immediately pay a special tariff (equal to the estimated dumping margin) on all imports of the product in question. The Commerce Department then makes its final determination as to whether or not dumping has taken place, as well as the size of the dumping margin. If the Commerce Department rules that dumping did not occur, special tariffs previously collected are rebated to U.S. importers. Otherwise, the International Trade Commission determines whether or not material injury has occurred as the result of the dumping.

If the International Trade Commission rules that import-competing firms were not injured by the dumping, the special tariffs are rebated to U.S. importers. If both the International Trade Commission and the Commerce Department rule in favor of the dumping petition, a permanent tariff is imposed that equals the size of the dumping margin calculated by the Commerce Department in its final investigation.

In recent years, the average antidumping duty imposed by the United States has been about 45 percent, with some duties exceeding 100 percent. The impact of these duties on trade has been substantial, with targeted imports typically falling 50 to 70 percent over the first three years of protection. Let us consider some cases involving dumping.

Whirlpool Agitates for Antidumping Tariffs on Clothes Washers

Whirlpool Corporation is the world’s leading producer of major home appliances with 93,000 employees, \$21 billion in annual sales, and 70 manufacturing and technology research centers throughout the world in 2017. The firm markets clothes washers and dryers, refrigerators, and other appliances under brand names such as Whirlpool, Maytag, and KitchenAid in almost every country around the world.

The origins of Whirlpool date back to 1908 when Lou Upton invested his savings in a venture to produce household equipment. When that company did not pan out, Upton was offered the opportunity to select something of value from the failed venture as compensation

for his investment. He selected the patents on a hand washing machine that he thought might be electrified. With his patents and innovative vision, Upton joined his uncle and brother to produce motor-driven wringer washers. With the passage of time, Whirlpool prospered and became the world's leading producer of major home appliances.

By the early 2000s, Whirlpool faced intense competition from foreign appliance producers in countries such as South Korea and Mexico. Increasingly, Whirlpool contended that these producers were selling their government-subsidized appliances in the United States at prices substantially less than fair value as defined by U.S. trade law. The result was lost market share for Whirlpool, decreases in its appliance production, and job losses for its workers.

In 2011 Whirlpool filed antidumping and antisubsidy petitions against clothes washer makers Samsung and LG. The petitions asked the U.S. Department of Commerce and the U.S. International Trade Commission to investigate washers produced in South Korea and Mexico and then sold in the United States at prices below fair value. In 2013, the Commerce Department and International Trade Commission ruled that Samsung and LG practiced unlawful pricing for clothes washers originating from South Korea and Mexico, and that Whirlpool was materially damaged by these trade practices. Per the ruling, the U.S. customs officials imposed antidumping and antisubsidy import tariffs ranging from 11 percent to 151 percent for various Samsung and LG products. However, Whirlpool's antidumping victory was short lived. Because enforcement of U.S. antidumping law is generally country-specific, both Samsung and LG shifted production from South Korea and Mexico to China, therefore rendering the just-imposed tariffs moot. This practice is known as "country hopping."

By 2016, this story was repeating itself. Whirlpool again filed antidumping petitions against Samsung and LG, alleging that these companies engaged in unlawful dumping of clothes washers that were produced in China, into the United States. The U.S. Commerce Department ruled that illegal dumping did occur. But before the U.S. International Trade Commission could rule on whether the dumped clothes washers materially injured Whirlpool, Samsung and LG moved their washer production to Vietnam and Thailand to get around possible antidumping duties. Whirlpool thus complained that the country-specific dumping policy of the United States did not provide it adequate protection.

President Donald Trump's "America First" slogan provided Whirlpool fresh hope for more aggressive protection against import competition. Rather than accusing Samsung and LG of illegally dumping washers into the U.S. market, Whirlpool filed a petition with the U.S. International Trade Commission asking for little-used policies to ramp up trade protection. Under Section 201 of the Trade Act of 1974, U.S. companies can win import protection if they only show that they suffer serious injury from a surge in imports, rather than injury from illegal dumping or foreign export subsidies. Because this special "safeguard" protection can be applied broadly to imports all over the world, rather than to imports from a specific country, it is intended to offer American companies a bigger defense against foreign competition than the more widely used antidumping and antisubsidy laws (see Chapter 6 of this text).

In 2017, the U.S. International Trade Commission approved Whirlpool's petition for safeguard protection, recommending that the Trump administration impose tariffs on imported washing machines to protect Whirlpool and other American manufacturers. In 2018, the Trump administration imposed tariffs of 50 percent on imported washers exceeding a quota of 1.2 million units annually. Analysts noted that, in spite of the import tariff, Whirlpool would still likely face intensifying competition from LG and Samsung, which were planning to start production in the United States.⁸

⁸Jacob Schlesinger and Andrew Tangel, "Whirlpool Wins Backing for Import Protection from Key Government Panel," October 5, 2017; Andrew Tangel, "Trade's Test Case: Your Washing Machine," October 4, 2017; "Whirlpool Wins, Rivals to Face Big Import Duty," *The Blade*, January 24, 2013; and "Whirlpool Wins Decision in Anti-Dumping Case," *Crain's Detroit Business*, January 24, 2013.

Vaughan-Bassett Furniture Company: Furniture Dumping from China

For much of the 1900s, southern Virginia and North Carolina were home to the world's biggest furniture factories and suppliers. These factories benefitted from the region's abundant hardwood forests, cheap labor, and a railroad running through the region.

One of these producers was Bassett Furniture Company, founded in 1902 by J. D. Bassett and his brothers. They owned a pair of sawmills that supplied railroad ties and bridge-building material for the construction of the Norfolk and Western Railroad. When the railroad was completed, the Bassetts started selling wood to furniture makers. Then the Bassetts realized that there was more profit in producing the furniture. So they formed their own furniture company to make wooden beds and dressers in a hamlet that eventually became known as Bassett, Virginia. The company flourished. Taking advantage of the fact that furniture designs are hard to protect, they used inexpensive wood and cheap labor to manufacture lookalike products. Bassett was able to undercut the established industry, which was headquartered in Grand Rapids, Michigan, and which had unions, craftsmen, and high wages.

In 1983, J. D. Bassett III (a grandson of J. D. Bassett) separated from the family business to become plant manager for a much smaller competitor, Vaughan-Bassett Furniture, in nearby Galax, Virginia. Initially the company was profitable, and it expanded its manufacturing operations. However, a furniture-making industry in Asia appeared, based on even cheaper labor and government-subsidized capital. The Asian furniture companies were ruthless competitors, and they cut prices to the bone. This resulted in falling market share for the American producers, dwindling profits, and the shedding of the jobs of their employees.

Most of the American furniture producers, including Bassett Furniture Company, did not fight this trend. Instead, they embraced it, showing Asian manufacturers how to make better furniture and selling these Asian-made items under their own brand names in their retail stores in the United States. Bassett Furniture Company gradually closed all but 2 of its 40 factories across the nation in favor of marketing imports and selling them in its retail stores.

However, J. D. Bassett III and his Vaughan-Bassett Furniture employees fought back. Bassett III upgraded his product line, asked his workers to suggest factory-floor improvements, and offered incentives to increase productivity. Also, his workers tore down the imported furniture and found out that there was no way the furniture could be sold at that low of a price without dumping, which is selling below cost of production and injuring the U.S. industry. So Bassett III formed a coalition with other American furniture manufacturers and filed an antidumping complaint against China, over the opposition of many American furniture retailers who imported heavily from China.

After spending a great deal of money on the dumping case, J. D. Bassett III won. In 2005, the U.S. government imposed dumping duties of about 7 percent on most Chinese furniture being shipped to the U.S. market. This resulted in a decrease in the amount of Chinese furniture that was sold in the United States. However, following the imposition of antidumping duties on Chinese furniture, imports from Vietnam, Indonesia, and other countries not subject to the antidumping restrictions emerged to fill the vacuum created by decreasing imports from China.

Although the duties were much lower than the 30 to 40 percent duties Bassett III had hoped for, they were helpful in returning his furniture company to profitability. Vaughan-Bassett Furniture is currently the largest wood bedroom manufacturer in the United States.⁹

⁹Beth Macy, *Factory Man*, Little, Brown and Company, Boston, MA, 2014; Marc Levinson, "Book Review: *Factory Man* by Beth Macy," *The Wall Street Journal*, July 18, 2014; and Daniel Ikenson, "Anti-dumping and Bedroom Furniture from China: The Real Story," *Cato at Liberty*, May 25, 2011

Is Antidumping Law Unfair?

Supporters of antidumping laws maintain that they are needed to create a “level playing field” for domestic producers that face unfair import competition. Antidumping laws ensure a level playing field by offsetting artificial sources of competitive advantage. By making up the difference between the dumped price and fair market value, an antidumping duty puts the domestic producer back on an equal footing. Critics note that although protected industries may gain from antidumping duties, consumers of the protected good and the wider economy typically lose more, as discussed in Chapter 4. It is not surprising that antidumping law is subject to criticism, as discussed below.

Should Average Variable Cost Be the Yardstick for Defining Dumping?

Under current rules, dumping can occur when a foreign producer sells goods in the United States at less than fair value. Fair value is equated with average total cost plus an 8 percent allowance for profit. However, many economists argue that fair value should be based on *average variable cost* rather than average total cost, especially when the domestic economy realizes a temporary downturn in demand.

Consider the case of a radio producer under the following assumptions: (1) The producer’s physical capacity is 150 units of output over the given time period. (2) The domestic market’s demand for radios is price inelastic, whereas foreign demand is price elastic. Refer to Table 5.3. Suppose the producer charges a uniform price (no dumping) of \$300 per unit to both domestic and foreign consumers. With domestic demand inelastic, domestic sales total 100 units. But with elastic demand conditions abroad, suppose the producer cannot market any radios at the prevailing price. Sales revenues would equal \$30,000, with variable costs plus fixed costs totaling \$30,000. Without dumping, the firm would find itself with an excess capacity of 50 radios. Moreover, the firm would just break even on its domestic market operations.

TABLE 5.3

Dumping and Excess Capacity

	No Dumping	Dumping
Home sales	100 units @ \$300	100 units @ \$300
Export sales	0 units @ \$300	50 units @ \$250
Sales revenue	\$30,000	\$42,500
Less variable costs of \$200 per unit	– 20,000	– 30,000
	\$10,000	\$12,500
Less total fixed costs of \$10,000	– 10,000	– 10,000
Profit	\$0	\$2,500

Suppose this producer decides to dump radios abroad at lower prices than at home. As long as all variable costs are covered, any price that contributes to fixed costs will permit larger profits (smaller losses) than those realized with idle plant capacity at hand. According to Table 5.3, by charging \$300 to home consumers, the firm can sell 100 units. Suppose that by charging a price of \$250 per unit, the firm is able to sell an additional 50 units abroad. The total sales revenue of \$42,500 would not only cover variable costs plus fixed costs, but would permit a profit of \$2,500.

With dumping, the firm is able to increase profits even though it is selling abroad at a price less than the average total cost (average total cost = $\$40,000/150 = \267). Firms facing excess production capacity may thus have the incentive to stimulate sales by cutting prices charged to foreigners—perhaps to levels that just cover average variable cost. Of course, domestic prices must be sufficiently high to keep the firm operating profitably over the relevant time period.

Many economists argue that antidumping laws that use average total cost as a yardstick to determine fair value are unfair. They note that economic theory suggests that under competitive conditions, firms price their goods at average variable costs that are below average total costs. Therefore, the antidumping laws punish firms that are simply behaving in a manner typical of competitive markets. Moreover, the law is unfair because U.S. firms selling at home are not subject to the same rules. Indeed, it is quite possible for a foreign firm that is selling at a loss both at home and in the United States to be found guilty of dumping when U.S. firms are also taking losses and selling in the domestic market at exactly the same price.

Should Antidumping Law Reflect Currency Fluctuations?

Another criticism of antidumping law is that it does not account for currency fluctuations. Consider the price-based definition of dumping: selling at lower prices in a foreign market. Because foreign producers often must set their prices for foreign customers in terms of a foreign currency, fluctuations in exchange rates can cause them to “dump” according to the legal definition. Suppose the Japanese yen appreciates against the U.S. dollar; that means that it takes fewer yen to buy a dollar. But if Japanese steel exporters are meeting competition in the United States and setting their prices in dollars, the appreciation of the yen will cause the price of their exports in terms of the yen to decrease, making it appear that they are dumping in the United States. Under the U.S. antidumping law, American firms are not required to meet the standard imposed on foreign firms selling in the United States. Does the antidumping law redress unfairness—or create it?

Are Antidumping Duties Overused?

Until the 1990s, antidumping actions were a protectionist device used almost exclusively by a few rich countries: the United States, Canada, Australia, and Europe. Since then, there has been an increase in the number of antidumping cases brought by many developing nations such as Mexico, India, and Turkey. Rising use by other nations has meant that the United States itself has become a more frequent target of antidumping measures.

The widening use of antidumping duties is not surprising given the sizable degree of trade liberalization that has occurred across the world economy. However, the proliferation of antidumping duties is generally viewed by economists as a disturbing trend, a form of backdoor protectionism that runs counter to the post–World War II trend of reducing barriers to trade. Although antidumping actions are legal under the rules of the WTO, there is concern of a vicious cycle where antidumping duties by one country invite retaliatory duties by other countries.

For U.S. producers, it has become much easier to obtain relief from import competition in the form of antidumping duties. One reason is that the scope for initiating an antidumping action has been widened from preventing predatory pricing to any form of international price discrimination. More aggressive standards for assessing the role of imports in harming domestic industries have also contributed to greater use of antidumping duties.

Critics of U.S. antidumping policy maintain that the U.S. Department of Commerce almost always finds that dumping has occurred, although positive findings of material injury by the U.S. International Trade Commission are less frequent. Critics also note that in many cases where imports were determined to be dumped under existing rules, they would not

have been questioned as posing an anticompetitive threat under the same countries' antitrust laws. In other words, the behavior of the importers, if undertaken by a domestic firm, would not have been questioned as anticompetitive or otherwise generally harmful.

Other Nontariff Trade Barriers

Other NTBs consist of governmental codes of conduct applied to imports. Even though such provisions are often well disguised, they remain important sources of commercial policy. Let's consider three such barriers: government procurement policies, social regulations, and sea transport and freight regulations.

Government Procurement Policies: “Buy American”

Because government agencies are large buyers of goods and services, they are attractive customers for foreign suppliers. If governments purchased goods and services only from the lowest cost suppliers, the pattern of trade would not differ significantly from that which occurs in a competitive market. However, most governments favor domestic suppliers over foreign ones in the procurement of materials and products. This is evidenced by the fact that the ratio of imports to total purchases in the public sector is much smaller than in the private sector, as seen in Table 5.4.

TABLE 5.4

Imports as a Share of Government Procurement* and as a Share of Gross Domestic Product, Selected Countries, 2011

Country	Imports for Government Procurement (percent)	Total Imports of Goods and Services (percent of GDP)
South Korea	14.0	54.3
Indonesia	7.1	23.9
India	6.5	31.1
Japan	5.2	15.5
Australia	5.2	20.1
Russia	4.9	20.2
European Union	4.4	40.0
United States	4.4	17.3
Mexico	3.8	32.5
World Average	5.6	30.1

*Federal, state, and local government.

Sources: Gary Clyde Hufbauer and Euijin Jung, *Buy American is Bad for Taxpayers and Worse for Exports*, Peterson Institute for International Economics, September 5, 2017; World Bank, World Development Indicators database; and Patrick Messerlin, “How Open Are Public Procurement Markets?” In *The Internationalization of Government Procurement Regulation*, eds. Aris Georgopoulos, Bernard Hoekman, and Petros Mavroidis. Oxford: Oxford University Press, 2017.

Governments often extend preferences to domestic suppliers in the form of **buy national policies**, a type of domestic content requirement. The U.S. government, through explicit laws, openly discriminates against foreign suppliers in its purchasing decisions. Also, state and local government agencies have buy national regulations, ranging from explicit prohibitions on purchases of foreign products to loose policy guidelines favoring U.S. products.

To stimulate domestic employment during the Great Depression, in 1933 the U.S. government passed the Buy American Act. This act requires federal agencies to

purchase materials and products from U.S. suppliers if their prices are not “unreasonably” higher than those of foreign competitors; however, services are not covered by the act. A product, to qualify as domestic, must have at least a 50 percent domestic component content and must be manufactured in the United States. As it stands today, U.S. suppliers of civilian agencies are given a 6 percent price preference margin. This margin means that a U.S. supplier receives the government contract as long as the U.S. low bid is no more than 6 percent higher than the competing foreign bid. This price preference margin rises to 12 percent if the low domestic bidder is situated in a labor surplus area and to 50 percent if the purchase is made by the Department of Defense. These preferences are waived when it is determined that the U.S.-produced good is not available in sufficient quantities or is not of satisfactory quality. The preferences are also waived for products made in designated countries that have reciprocal trade agreements with the United States—that is, for countries that have signed the government procurement code of the WTO, countries that have free trade agreements with the United States, the least developed countries, and the Caribbean basin countries.

Similarly, in 1982, the U.S. government enacted the Buy America Act which applies domestic preferences for infrastructure-related procurements (highways, bridges, railways) valued at more than \$100,000, for which funding includes grants administered by the Federal Transit Authority or the Federal Highway Administration. The act generally requires that steel, iron, and manufactured products made primarily of steel or iron and used in infrastructure projects be produced or manufactured in the United States. Exceptions, though rare, can be granted from the restrictions of the act when (1) iron, steel, and manufactured products are not available in sufficient quantities and of a satisfactory quality in the United States; (2) the use of American products would increase the cost of the overall infrastructure project by more than 25 percent; or (3) the application of the Buy America provision would be inconsistent with the public interest. However, there are no designated-country exceptions to the Buy America Act of 1982. Therefore, this act tends to create a more significant preference for American products than does the Buy American Act of 1933, which allows for designated-country exceptions to preferences for American products.

Concerning steel, one reason for exceptions to the Buy America Act is that American companies tend to have limited capability to produce steel of certain strengths, thickness, and flexibility. For example, most higher-strength steels used in thin-walled pipelines are made overseas; such steel is purchased by American oil companies for their drilling projects. Thus, retrofitting U.S. plants to manufacture a type of steel for a few oil projects could delay the drilling project’s construction and raise the cost. Also, additional American steel workers would have to be retrained, which might not be feasible in the short run. So American oil companies often have no alternative but to purchase foreign steel.

What are the disadvantages of Buy American policies? By discriminating against low-cost foreign suppliers in favor of domestic suppliers, buy national policies are a barrier to free trade. Domestic suppliers are given the leeway to use less efficient production methods and to pay resource prices higher than those permitted under free trade. This leeway yields a higher cost for government projects and deadweight welfare losses for the nation in the form of the protective and consumption effects. Also, “Buy American” encourages other nations to enact buy national policies—“Buy China,” “Buy Canada,” “Buy France.” U.S. exporters thus have difficulty selling abroad when they confront buy national policies of other nations.

For example, during 2001–2004, the California Transit Authority rebuilt portions of the earthquake-damaged San Francisco–Oakland Bay Bridge. However, the project cost was about \$4 billion, three times more than the agency originally expected. One reason was California’s Buy American rules that required that foreign steel could be used on the bridge only if its cost was at least 25 percent less than domestic steel. In this case, the difference

was only 23 percent, so the state had to purchase domestic steel. That difference added \$400 million to the price tag. Although this requirement benefitted domestic steel producers, it was difficult to see how it helped California taxpayers.¹⁰

INTERNATIONAL TRADE APPLICATION

U.S. Fiscal Stimulus and Buy American Legislation

As the U.S. government moved toward enacting its \$787 billion fiscal stimulus legislation during the recession of 2007–2009, debate emerged over whether government-funded projects should use only U.S.-made materials. According to proponents of Buy American legislation, not one dollar of stimulus expenditures should be spent on foreign goods; instead, taxpayers' dollars should be used to buy U.S.-made goods and thus support the jobs of Americans.



The initial fiscal stimulus bill sponsored by the House of Representatives stipulated that none of the funds made available by the bill could be used for infrastructure projects unless all of the iron and steel used in a project were produced in the United States. The Senate version went even further, mandating that all manufactured goods used in construction projects come from U.S. producers. This legislation was strongly favored by U.S. labor unions and companies such as U.S. Steel Corp.

Although President Barack Obama supported Buy American legislation during his presidential campaign in 2008, his enthusiasm weakened by 2009. The initial foreign reaction to possible Buy American legislation was outrage. The European Union warned that passage of the legislation would result in the United States violating

past trade agreements and intensifying the possibility of a trade war that could plunge the world into depression.

Also, U.S. exporting companies such as Caterpillar argued that foreign retaliation would greatly reduce their sales abroad: Caterpillar noted that in 2009, 60 percent of its revenue was from foreign sales.

In response to these concerns, Obama came out against Buy American provisions that signaled blatant protectionism. He wound up signing a fiscal stimulus bill that included a watered down version of the Buy American provisions contained in the House and Senate stimulus bills. For example, federal agencies can waive Buy American preferences if they inflate the cost of a construction project by more than 25 percent or are deemed to be against the public interest. City and state (municipal) governments in the United States are not obligated to honor the trade agreements of the federal government: They have been able to enact Buy American preferences that exclude firms in Canada, Mexico, and other countries from bidding on municipal construction contracts for schools, water treatment plants, and the like.

What do you think? Should American taxpayer dollars be used to finance the federal government's purchases of supplies from firms of other nations?

Social Regulations

Since the 1950s, nations have assumed an increasing role in regulating the quality of life for society. **Social regulation** attempts to correct a variety of undesirable side effects in an economy that relate to health, safety, and the environment—effects that markets, left to themselves, often ignore. Social regulation applies to a particular issue, such as environmental quality, and affects the behavior of firms in many industries such as automobiles, steel, and chemicals.

CAFE Standards

Although social regulations may advance health, safety, and environmental goals, they can also serve as barriers to international trade. Consider the case of fuel economy standards imposed by the U.S. government on automobile manufacturers.

¹⁰“Steep Cost Overruns, Delays Plague Efforts to Rebuild Bay Bridge,” *Los Angeles Times*, May 29, 2004.

Originally enacted in 1975, **corporate average fuel economy (CAFE) standards** represent the foundation of U.S. energy conservation policy. Applying to all passenger vehicles sold in the United States, the standards are based on the average fuel efficiency of all vehicles sold by all manufacturers. As of 2016, the CAFE requirement was 37.8 miles per gallon for passenger cars and 28.8 miles per gallon for light trucks. Manufacturers whose average fuel economy falls below this standard are subject to fines.

During the 1980s, CAFE requirements were used not only to promote fuel conservation but also to protect the jobs of U.S. autoworkers. The easiest way for U.S. car manufacturers to improve the average fuel efficiency of their fleets would have been to import smaller, more fuel-efficient vehicles from their subsidiaries in Asia and Europe. However, this would have decreased employment in an already depressed industry. The U.S. government thus enacted *separate but identical* standards for domestic and imported passenger cars. General Motors, Ford, and Chrysler, which manufactured vehicles in the United States and also sold imported cars, would be required to fulfill CAFE targets for *both* categories of vehicles. Thus, U.S. firms could not fulfill CAFE standards by averaging the fuel economy of their imports with their less fuel-efficient, domestically produced vehicles. By calculating domestic and imported fleets separately, the U.S. government attempted to force domestic firms not only to manufacture more fuel-efficient vehicles but also to produce them in the United States! In short, government regulations sometimes place effective import barriers on foreign commodities, whether they are intended to do so or not, which aggravates foreign competitors.

Europe Has a Cow over Hormone-Treated U.S. Beef

The EU's ban on hormone-treated meat is another case where social regulations can lead to a beef. Growth-promoting hormones are used widely by livestock producers to speed up growth rates and produce leaner livestock more in line with consumer preferences for diets with reduced fat and cholesterol. However, critics of hormones maintain that they can cause cancer for consumers of meat.

In 1989, the EU enacted its ban on the production and importation of beef derived from animals treated with growth-promoting hormones. The EU justified the ban as necessary to protect the health and safety of consumers.

The ban was immediately challenged by U.S. producers who used the hormones in about 90 percent of their beef production. According to the United States, there was no scientific basis for the ban that restricted beef imports on the basis of health concerns. Instead, the ban was merely an attempt to protect the relatively high-cost European beef industry from foreign competition. American producers noted that when the ban was imposed, European producers had accumulated large, costly-to-store beef surpluses that resulted in enormous political pressure to limit imports of beef. According to the United States, the EU's emphasis on health concerns was thus a smokescreen for protecting an industry with comparative disadvantage.

The trade dispute eventually went to the WTO (see Chapter 6), which ruled the EU's ban on hormone-treated beef was illegal and resulted in lost annual U.S. exports of beef to the EU in the amount of \$117 million. Nonetheless, the EU, citing consumer preference, refused to lift its ban. The WTO authorized the United States to impose tariffs high enough to prohibit \$117 million of European exports to the United States. The United States exercised its right and slapped 100 percent tariffs on a list of European products that included tomatoes, Roquefort cheese, prepared mustard, goose liver, citrus fruit, pasta, hams, and other products. The U.S. hit list focused on products from Denmark, France, Germany, and Italy—the biggest supporters of the EU's ban on hormone-treated beef.

By effectively doubling the prices of the targeted products, the 100 percent tariffs pressured the Europeans to liberalize their imports of American beef products. In 2009, the EU and the United States signed an agreement that resulted in the EU agreeing to import more beef from the United States that is not treated with growth-promoting hormones. In return, the United States agreed to refrain from implementing higher duties on selected products imported from the EU. Yet the EU continued to ban imports of hormone-treated meat.

At the writing of this textbook, President Donald Trump was considering imposing tariffs of 100 percent on Perrier mineral water, Vespa motor scooters, and Roquefort cheese in response to the EU's longstanding ban of American beef from hormone-treated cattle. It remains to be seen how this issue will play out.

Sea Transport and Freight Regulations

During the 1990s, U.S. shipping companies serving Japanese ports complained of a highly restrictive system of port services. They contended that Japan's association of stevedore companies (companies that unload cargo from ships) used a system of prior consultations to control competition, allocate harbor work among themselves, and frustrate the implementation of any cost cutting by shipping companies.

In particular, shipping companies contended that they were forced to negotiate with the Japanese stevedore company association on everything from arrival times to choice of stevedores and warehouses. Because port services were controlled by the stevedore company association, foreign carriers could not negotiate with individual stevedore companies about prices and schedules. Moreover, U.S. carriers maintained that the Japanese government approved these restrictive practices by refusing to license new entrants into the port service business and supporting the requirement that foreign carriers negotiate with Japan's stevedore company association.

A midnight trip to Tokyo Bay illustrates the frustration of U.S. shipping companies. The lights are dimmed and the wharf is quiet, even though the *Sealand Commerce* has just docked. At 1:00 A.M., lights turn on, cranes swing alive, and trucks appear to unload the ship's containers that carry paper plates, computers, and pet food from the United States. However, at 4 A.M., the lights shut off and the work ceases. Longshoremen don't return until 8:30 A.M. and take three more hours off later in the day. They unloaded only 169 of 488 containers that they must handle before the ship sails for Oakland. At that rate, the job takes until past noon, but at least it isn't Sunday when docks close altogether.

When the *Sealand Commerce* reaches Oakland, however, U.S. dockworkers unload and load 24 hours a day, taking 30 percent less time for about half the price. To enter Tokyo Bay, the ship had to clear every detail of its visit with Japan's stevedore company association; to enter the U.S. port, the ship will merely notify port authorities and the Coast Guard. According to U.S. exporters, this unequal treatment on waterfronts is a trade barrier because it makes U.S. exports more expensive in Japan.

In 1997, the United States and Japan found themselves on the brink of a trade war after the U.S. government decided to direct its Coast Guard and customs service to bar Japanese-flagged ships from unloading at U.S. ports. The U.S. government demanded that foreign shipping companies be allowed to negotiate directly with Japanese stevedore companies to unload their ships, thus giving carriers a way around the restrictive practices of Japan's stevedore company association. After consultation between the two governments, an agreement was reached to liberalize port services in Japan. As a result, the United States rescinded its ban against Japanese ships.

SUMMARY

1. With the decline in import tariffs in the past two decades, nontariff trade barriers have gained in importance as a measure of protection. Nontariff trade barriers include such practices as (a) import quotas, (b) orderly marketing agreements, (c) domestic content requirements, (d) subsidies, (e) antidumping regulations, (f) discriminatory government procurement practices, (g) social regulations, and (h) sea transport and freight restrictions.
2. An import quota is a government-imposed limit on the quantity of a product that can be imported. Quotas are imposed on a global (worldwide) basis or a selective (individual country) basis. Although quotas have many of the same economic effects as tariffs, they tend to be more restrictive. A quota's revenue effect generally accrues to domestic importers or foreign exporters, depending on the degree of market power they possess. If government desired to capture the revenue effect, it could auction import quota licenses to the highest bidder in a competitive market.
3. A tariff-rate quota is a two-tier tariff placed on an imported product. It permits a limited number of goods to be imported at a lower tariff rate, whereas any imports beyond this limit face a higher tariff. Of the revenue generated by a tariff-rate quota, some accrues to the domestic government as tariff revenue and the remainder is captured by producers as windfall profits.
4. Because an export quota is administered by the government of the exporting nation (supply-side restriction), its revenue effect tends to be captured by sellers from the exporting nation. For the importing nation, the quota's revenue effect is a welfare loss in addition to the protective and consumption effects.
5. Domestic content requirements try to limit the practice of foreign sourcing and encourage the development of domestic industry. They typically stipulate the minimum percentage of a product's value that must be produced in the home country for that product to be sold tariff free. Domestic content protection tends to impose welfare losses on the domestic economy in the form of higher production costs and higher-priced goods.
6. Government subsidies are sometimes granted as a form of protection to domestic exporters and import-competing producers. They may take the form of direct cash bounties, tax concessions, credit extended at low interest rates, or special insurance arrangements. Direct production subsidies for import-competing producers tend to involve a smaller loss in economic welfare than do equivalent tariffs and quotas. The imposition of export subsidies results in a terms-of-trade effect and an export revenue effect.
7. International dumping occurs when a firm sells its product abroad at a price that is less than average total cost or less than that charged to domestic buyers of the same product. Dumping can be sporadic, predatory, or persistent in nature. Idle productive capacity may be the reason behind dumping. Governments often impose stiff penalties against foreign commodities that are believed to be dumped in the home economy.
8. Government rules and regulations in areas such as safety and technical standards and marketing requirements can have a significant impact on world trade patterns.

KEY CONCEPTS AND TERMS

Absolute quota (p. 157)	Dumping (p. 171)	Persistent dumping (p. 172)
Antidumping duty (p. 174)	Export quotas (p. 164)	Predatory dumping (p. 171)
Buy national policies (p. 180)	Export subsidy (p. 168)	Price-based definition of dumping (p. 175)
Corporate average fuel economy (CAFE) standards (p. 183)	Global quota (p. 158)	Selective quota (p. 158)
Cost-based definition of dumping (p. 175)	Import licenses (p. 158)	Social regulation (p. 182)
Domestic content requirements (p. 166)	License on demand allocation (p. 163)	Sporadic dumping (p. 171)
Domestic production subsidy (p. 168)	Margin of dumping (p. 175)	Subsidies (p. 168)
	Nontariff trade barriers (NTBs) (p. 157)	Tariff-rate quota (p. 162)

STUDY QUESTIONS

- In the past two decades, nontariff trade barriers have gained in importance as protectionist devices. What are the major nontariff trade barriers?
- How does the revenue effect of an import quota differ from that of a tariff?

TABLE 5.5

Venezuela Supply of and Demand for Television Sets

Price per TV Set	Quantity Demanded	Quantity Supplied
\$100	900	0
200	700	200
300	500	400
400	300	600
500	100	800

- What are the major forms of subsidies that governments grant to domestic producers?
- What is meant by voluntary export restraints, and how do they differ from other protective barriers?
- Should U.S. antidumping laws be stated in terms of average total production costs or average variable costs?
- Which is a more restrictive trade barrier—an import tariff or an equivalent import quota?
- Differentiate among sporadic, persistent, and predatory dumping.
- A subsidy may provide import-competing producers the same degree of protection as tariffs or quotas but at a lower cost in terms of national welfare. Explain.
- Rather than generating tax revenue as do tariffs, subsidies require tax revenue. Therefore, they are not an effective protective device for the home economy. Do you agree?
- In 1980, the U.S. auto industry proposed that import quotas be imposed on foreign-produced cars sold in the United States. What would be the likely benefits and costs of such a policy?
- Why did the U.S. government in 1982 provide import quotas as an aid to domestic sugar producers?
- Which tends to result in a greater welfare loss for the home economy: (a) an import quota levied by the home government or (b) a voluntary export quota imposed by the foreign government?
- What would be the likely effects of export restraints imposed by Japan on its auto shipments to the United States?
- Why might firms using U.S. steel lobby against the imposition of quotas on foreign steel sold in the United States?
- Concerning international dumping, distinguish between the price- and cost-based definitions of foreign market value.
- Table 5.5 illustrates the demand and supply schedules for television (TV) sets in Venezuela, a “small” nation that is unable to affect world prices. On graph paper, sketch Venezuela’s demand and supply schedules of TV sets.
 - Suppose Venezuela imports TV sets at a price of \$150 each. Under free trade, how many sets does Venezuela produce, consume, and import? Determine Venezuela’s consumer surplus and producer surplus.
 - Assume that Venezuela imposes a quota that limits imports to 300 TV sets. Determine the quota-induced price increase and the resulting decrease in consumer surplus. Calculate the quota’s redistributive, consumption, protective, and revenue effects. Assuming that Venezuelan import companies organize as buyers and bargain favorably with competitive foreign exporters, what is the overall welfare loss to Venezuela as a result of the quota? Suppose that foreign exporters organize as a monopoly seller. What is the overall welfare loss to Venezuela as a result of the quota?
 - Suppose that, instead of a quota, Venezuela grants its import-competing producers a subsidy of \$100 per TV set. In your diagram, draw the subsidy-adjusted supply schedule for Venezuelan producers. Does the subsidy result in a rise in the price of TV sets above the free trade level? Determine Venezuela’s production, consumption, and imports of TV sets under the subsidy. What is the total cost of the subsidy to the Venezuelan government? Of this amount, how much is transferred to Venezuelan producers in the form of producer surplus, and how much is absorbed by higher production costs due to inefficient domestic production? Determine the overall welfare loss to Venezuela under the subsidy.

17. This question applies to the welfare effects of an export quota that is examined in *Exploring Further 5.2*, which can be found in **MindTap**. Table 5.6 illustrates the demand and supply schedules for computers in Ecuador, a “small” nation that is unable to affect world prices. On graph paper, sketch Ecuador’s demand and supply schedules of computers.

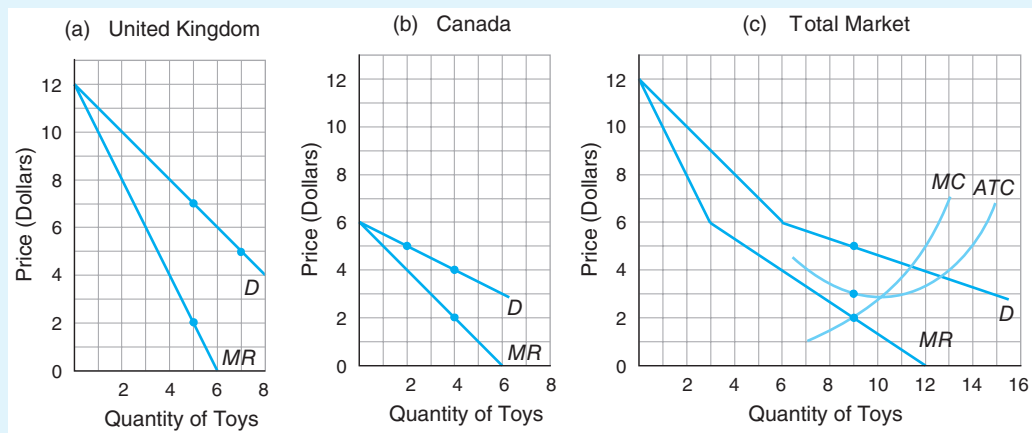
TABLE 5.6
Computer Supply and Demand: Ecuador

Price of Computer	Quantity Demanded	Quantity Supplied
\$0	100	—
200	90	0
400	80	10
600	70	20
800	60	30
1,000	50	40
1,200	40	50
1,400	30	60
1,600	20	70
1,800	10	80
2,000	0	90

- a. Assume that Hong Kong and Taiwan can supply computers to Ecuador at a per unit price of \$300 and \$500, respectively. With free trade, how many computers does Ecuador import? From which nation does it import?

- b. Suppose Ecuador and Hong Kong negotiate a voluntary export agreement in which Hong Kong imposes on its exporters a quota that limits shipments to Ecuador to 40 computers. Assume Taiwan does not take advantage of the situation by exporting computers to Ecuador. Determine the quota-induced price increase and the reduction in consumer surplus for Ecuador. Determine the quota’s redistributive, protective, consumption, and revenue effects. Because the export quota is administered by Hong Kong, its exporters will capture the quota’s revenue effect. Determine the overall welfare loss to Ecuador as a result of the quota.
- c. Again assume that Hong Kong imposes an export quota on its producers that restricts shipments to Ecuador to 40 computers, but now suppose that Taiwan, a nonrestrained exporter, ships an additional 20 computers to Ecuador. Ecuador thus imports 60 computers. Determine the overall welfare loss to Ecuador as a result of the quota.
- d. In general, when increases in nonrestrained supply offset part of the cutback in shipments that occurs under an export quota, will the overall welfare loss for the importing country be greater or smaller than that which occurs in the absence of nonrestrained supply? Determine the amount in the example of Ecuador.
18. Figure 5.6 illustrates the practice of international dumping by British Toys, Inc. (BTI). Figure 5.6(a) shows the domestic demand and marginal revenue

FIGURE 5.6
International Dumping Schedules



schedules faced by BTI in the United Kingdom (UK), and Figure 5.6(b) shows the demand and marginal revenue schedules faced by BTI in Canada. Figure 5.6(c) shows the combined demand and marginal revenue schedules for the two markets, as well as BTI's average total cost and marginal cost schedules.

- a. In the absence of international dumping, BTI would charge a uniform price to U.K. and Canadian customers (ignoring transportation costs). Determine the firm's profit-maximizing output and price, as well as total profit. How much profit accrues to BTI on its U.K. sales and on its Canadian sales?
 - b. Suppose now that BTI engages in international dumping. Determine the price that BTI charges its U.K. buyers and the profits that accrue on U.K. sales. Also determine the price that BTI charges its Canadian buyers and the profits that accrue on Canadian sales. Does the practice of international dumping yield higher profits than the uniform pricing strategy and, if so, by how much?
19. Why is a tariff-rate quota viewed as a compromise between the interests of the domestic consumer and those of the domestic producer? How does the revenue effect of a tariff-rate quota differ from that of an import tariff?

EXPLORING FURTHER

The welfare effects of a tariff-rate quota are discussed in *Exploring Further 5.1*, available in **MindTap**. The welfare effects of an export quota are further examined in *Exploring Further 5.2*, available in **MindTap**.

Trade Regulations and Industrial Policies



Previous chapters have examined the benefits and costs of tariff and nontariff trade barriers. This chapter discusses the major trade policies of the United States. It also considers the role of the World Trade Organization (WTO) in the global trading system, the industrial policies implemented by nations to enhance the competitiveness of their producers, and the nature and effects of international economic sanctions used to pursue foreign policy objectives.

U.S. Tariff Policies Before 1930

As Table 6.1 makes clear, U.S. tariff history has been marked by fluctuations. The dominant motive behind the early tariff laws of the United States was to provide the government with an important source of tax revenue. This *revenue* objective was the main reason Congress passed the first tariff law in 1789. This law allowed only the federal government to levy uniform tariffs, ranging from 5 to 15 percent, so the former system of separate state tariff rates disappeared. Tariffs were the largest source of federal revenue during this era, accounting for over 90 percent of federal revenue during the 1790s. Tariffs were the biggest funding source of the U.S. government from its founding until the advent of the federal income tax in 1913. As the economy diversified and developed alternative sources of tax revenue, such as the income tax and payroll tax, justification for the revenue motive was weakened. The tariffs collected by the federal government today are only about 1 percent of total federal revenues, a negligible amount.

As the revenue argument weakened, the *protective* argument for tariffs developed strength. In 1791, Alexander Hamilton presented to Congress his famous “Report on Manufacturers” that proposed the young industries of the United States be granted import protection until they could grow and prosper—the *infant industry* argument. Although Hamilton’s writings did not initially have a legislative impact, by the 1820s, protectionist sentiments in the United States were well established, especially in the Northern states where manufacturing industries were being developed. However, intense political opposition

TABLE 6.1**U.S. Tariff History: Average Tariff Rates**

Tariff Laws and Dates	Average Tariff Rate* (%)
McKinley Law, 1890	48.4
Wilson Law, 1894	41.3
Dingley Law, 1897	46.5
Payne–Aldrich Law, 1909	40.8
Underwood Law, 1913	27.0
Fordney–McCumber Law, 1922	38.5
Smoot–Hawley Law, 1930	53.0
1930–1949	33.9
1950–1969	11.9
1970–1989	6.4
1990–1999	5.2
2000–2009	3.5
2015	3.5

*Simple average.

Source: From U.S. Department of Commerce, *Statistical Abstract of the United States*, various issues, and World Trade Organization, *World Tariff Profiles*, 2016.

to higher tariffs came from Southerners who had almost no manufacturing industry and imported many products with high tariffs. Southerners claimed that they would have to pay more for manufactured imports while getting less for the cotton they sold abroad.

The surging protectionist movement reached its high point in 1828 with the passage of the so-called Tariff of Abominations. This measure increased duties to an average level of 45 percent, the highest in the years prior to the Civil War and provoked the South, which wanted low duties for its imported manufactured goods. The South's opposition to this tariff led to the passage of the Compromise Tariff of 1833, which provided for a downsizing of the tariff protection afforded to U.S. manufacturers. During the 1840s and 1850s, the U.S. government found that it faced an excess of tax receipts over expenditures. Therefore, the government passed the Walker tariffs that cut duties to an average level of 23 percent in order to eliminate the budget surplus. Further tariff cuts took place in 1857, bringing the average tariff levels to their lowest point since 1816, at around 16 percent.

During the Civil War era, tariffs were again raised with the passage of the Morrill Tariffs of 1861, 1862, and 1864. These measures were primarily intended as a means of paying for the Civil War. By 1870, protection climbed back to the heights of the 1840s; this time the tariff levels would not be reduced. During the latter part of the 1800s, U.S. policy makers were impressed by the arguments of American labor and business leaders who complained that *cheap foreign labor* was causing goods to flow into the United States. The enactment of the McKinley and Dingley Tariffs largely rested upon this argument. By 1897, tariffs on protected imports averaged 46 percent.

Although the Payne–Aldrich Tariff of 1909 marked the turning point against rising protectionism, it was the enactment of the Underwood Tariff of 1913 that reduced duties to 27 percent on average. Trade liberalization might have remained on a more permanent basis had it not been for the outbreak of World War I. Protectionist pressures built up during the war years and maintained momentum after the war's conclusion. During the early

1920s, the *scientific tariff* concept was influential, and in 1922, the Fordney–McCumber Tariff contained, among other provisions, one that allowed the president to increase tariff levels if foreign production costs were below those of the United States. Average tariff rates climbed to 38 percent under the Fordney–McCumber Law.¹

Smoot–Hawley Act

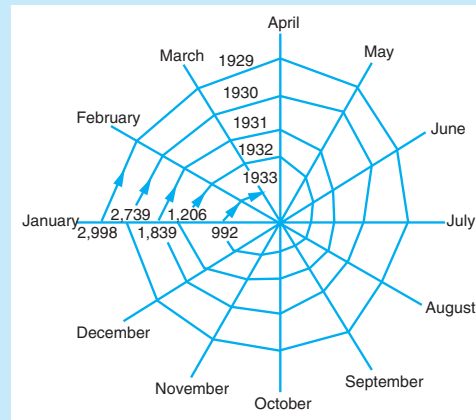
The crash of the U.S. stock market in 1929 and the fall of the American economy into the Great Depression resulted in the country’s unemployment steadily climbing upward and ultimately peaking at 25 percent in 1933. Although the U.S. government could have responded with fiscal stimulus, such as government spending projects, or the Federal Reserve could have cut interest rates in order to increase domestic spending, neither of these policies were implemented. Instead, the U.S. government implemented tariffs to reduce America’s imports and thus protect its firms and workers. This policy pushed costs onto America’s trade partners, by decreasing their sales and the price they receive for goods that they exported to the United States.

The high point of U.S. protectionism occurred with the passage of the **Smoot–Hawley Act** in 1930, under which U.S. average tariffs were raised to 53 percent on protected imports. As the Smoot–Hawley bill moved through the U.S. Congress, formal protests from foreign nations flooded Washington, eventually adding up to a document of 200 pages. Nevertheless, both the House of Representatives and the Senate approved the bill. Although about a thousand U.S. economists beseeched President Herbert Hoover to veto the legislation, he did not do so, and the tariff was signed into law on June 17, 1930. Simply put, the Smoot–Hawley Act tried to divert national demand away from imports and toward domestically produced goods.

The legislation provoked retaliation by 25 trading partners of the United States. Spain implemented the Wais Tariff in reaction to U.S. tariffs on cork, oranges, and grapes. Switzerland boycotted U.S. exports to protest new tariffs on watches and shoes. Canada increased its tariffs threefold in reaction to U.S. tariffs on timber, logs, and many food products. Italy retaliated against tariffs on olive oil and hats with tariffs on U.S. automobiles. Mexico, Cuba, Australia, and New Zealand also participated in the tariff wars. Other beggar-thy-neighbor policies, such as foreign-exchange controls and currency depreciations, were also implemented. The effort by several nations to run a trade surplus by reducing imports led to a breakdown of the international trading system. Within two years after the Smoot–Hawley Act, U.S. exports decreased by nearly two-thirds. Figure 6.1 shows the decline of world trade as the global economy fell into the Great Depression.

How did President Hoover fall into such a protectionist trap? The president felt compelled to honor the 1928 Republican platform calling for tariffs to aid the weakened farm economy. The stock market crash of 1929 and the imminent Great Depression further led to a crisis atmosphere. Republicans had been sympathetic to protectionism for decades. Now they viewed import tariffs as a method of fulfilling demands that government should initiate positive steps to combat domestic unemployment.

¹Throughout the 1800s, the United States levied high tariffs on imported goods, the infant industry argument being an important motive. The second half of the 1800s was also a period of rapid economic growth for the country. According to protectionists, these tariffs provided the foundation for a growing economy. However, free traders note that such conclusions are unwarranted because this era was also a time of massive immigration to the United States, which fostered economic growth. See T. Norman Van Cott and Cecil Bohanon, “Tariffs, Immigration, and Economic Insulation,” *The Independent Review*, Spring 2005, pp. 529–542.

FIGURE 6.1**Smoot–Hawley Protectionism and World Trade, 1929–1933 (millions of dollars)**

The figure shows the pattern of world trade from 1929 to 1933. Following the Smoot–Hawley Tariff Act of 1930, which raised U.S. tariffs to an average level of 53 percent, other nations retaliated by increasing their own import restrictions, and the volume of world trade decreased as the global economy fell into the Great Depression.

Source: Data taken from League of Nations, *Monthly Bulletin of Statistics*, February, 1934. See also Charles Kindleberger, *The World in Depression* (Berkeley, CA University of California Press, 1973), p. 170.

President Hoover felt bound to tradition and to the platform of the Republican Party. Henry Ford spent an evening with Hoover requesting a presidential veto of what he referred to as “economic stupidity.” Other auto executives sided with Ford. Tariff legislation had never before been vetoed by a president and Hoover was not about to set a precedent. Hoover remarked that “with returning normal conditions, our foreign trade will continue to expand.”

By 1932, U.S. trade with other nations had collapsed. Presidential challenger Franklin Roosevelt denounced the trade legislation as ruinous. Hoover responded that Roosevelt would have U.S. workers compete with peasant labor overseas. Following Hoover’s defeat in the presidential election of 1932, the Democrats dismantled the Smoot–Hawley legislation. But they used caution, relying on reciprocal trade agreements instead of across-the-board tariff concessions by the United States. Sam Rayburn, the speaker of the House of Representatives, insisted that any party member who wanted to be a member of the House Ways and Means Committee had to support trade reciprocity instead of protectionism. The Smoot–Hawley approach was discredited, and the United States pursued trade liberalization via reciprocal trade agreements.

Reciprocal Trade Agreements Act

The combined impact on U.S. exports of the Great Depression and the foreign retaliatory tariffs imposed in reaction to the Smoot–Hawley Act resulted in a reversal of U.S. trade policy. In 1934, Congress passed the **Reciprocal Trade Agreements Act** that changed U.S. trade policies by transferring authority from the Congress, which generally favored

domestic import-competing producers, to the president, who tended to consider the national interest when forming trade policy. This change tipped the balance of power in favor of lower tariffs and set the stage for a wave of trade liberalization. Specifically aimed at tariff reduction, the act contained two features: negotiating authority and generalized reductions.

Under this law, the president was given the unprecedented authority to negotiate *bilateral* tariff reduction agreements with foreign governments (for example, between the United States and Sweden). Without congressional approval, the president could lower tariffs by up to 50 percent of the existing level. Enactment of any tariff reductions was dependent on the willingness of other nations to reciprocally lower their tariffs on U.S. goods. From 1934 to 1947, the United States entered into 32 bilateral tariff agreements, and over this period, the average level of tariffs on protected products fell to about half of the 1934 levels.

The Reciprocal Trade Agreements Act also provided generalized tariff reductions through the **most favored nation (MFN) clause**. This clause means that countries cannot normally discriminate between their trading partners: Grant one country a lower tariff rate for one of its products and you must do the same for all other countries. In general, MFN means that every time a country reduces a trade barrier or opens up a market, it must do so for the same goods or services from all of its trading partners whether rich or poor. In 1998, the U.S. government replaced the term most favored nation with **normal trade relations**.

Although the Reciprocal Trade Agreements Act tipped the political balance of power in favor of lower tariffs, its piecemeal, bilateral approach limited the trade liberalization efforts of the United States. The United States recognized that a more comprehensive approach was needed to liberalize trade on a multilateral basis.

General Agreement on Tariffs and Trade

Partly in response to trade disruptions during the Great Depression, the United States and some of its allies sought to impose order on trade flows after World War II. The first major postwar step toward liberalization of trade on a multilateral basis was the **General Agreement on Tariffs and Trade (GATT)** signed in 1947. GATT was crafted as an agreement among contracting parties, the member nations, to decrease trade barriers and place all nations on an equal footing in trading relations. GATT was never intended to become an organization; instead, it was a set of agreements among countries around the world to reduce trade barriers and establish broad rules for commercial policy.

In 1995, GATT was transformed into the **World Trade Organization (WTO)**. The WTO embodies the main provisions of GATT, but its role was expanded to include a mechanism intended to improve GATT's process for resolving trade disputes among member nations. Let us first discuss the major principles of the original GATT system.

Trade without Discrimination

According to GATT, a member country should not discriminate between its trading partners. The two pillars of the nondiscrimination principle were the MFN principle (normal trade relations) and the national treatment principle.

According to the MFN principle, if a member of GATT granted another member a lower tariff rate for one of its products, it had to do the same for all other GATT members. The MFN thus meant “favor one, favor all.” Some exceptions are allowed. Countries can establish a free trade agreement that applies only to goods traded within the group, thus discriminating against goods from nonmembers, or they can provide developing countries special access (low tariffs) to their markets. A country might also increase trade barriers against goods that are deemed to be traded unfairly from certain countries.

Granting MFN status or imposing differential tariffs has been used as an instrument of foreign policy. A nation may punish unfriendly nations with high import tariffs on their goods and reward friendly nations with low tariffs. As of 2016, the United States granted MFN status to most of the nations with which it trades, with the exceptions being Cuba and North Korea.

The second aspect of trade without discrimination involved the national treatment principle. Under this principle, GATT members had to treat imported and domestically produced goods equally, once the foreign goods entered the market. Therefore, domestic regulations and internal taxes could not be biased against foreign products. Tariffs could apply to foreign products when they entered a country as imports.

The Canadian periodicals industry illustrates the use of discriminatory taxes that have violated the national treatment principle. A long-standing policy of the Canadian government has been to protect its magazine industry as a medium of Canadian ideas and interests and a tool for the promotion of Canadian culture. In the 1990s, the Canadian government levied a steep tax on U.S. magazines such as *Sports Illustrated* that were sold to Canadians. The intent of the tax was to make it unprofitable for U.S. firms to publish special edition periodicals aimed at the Canadian market, thereby protecting the advertising revenues of Canadian publications. These taxes were found to violate the national treatment rules established in GATT because they discriminated against foreign magazines.

Promoting Freer Trade

Another goal of GATT was to promote freer trade through its role in the settlement of trade disputes. Historically, trade disputes consisted of matters strictly between the disputants; no third party was available to whom they might appeal for a favorable remedy. As a result, conflicts often remained unresolved for years. When they were settled, the stronger country generally won at the expense of the weaker country. GATT improved the dispute resolution process by formulating complaint procedures and providing a conciliation panel to which a victimized country could express its grievance. GATT's dispute settlement process did not include the authority to enforce the conciliation panel's recommendations—a weakness that inspired the formation of the WTO.

GATT also obligated its members to use tariffs rather than quotas to protect their domestic industry. GATT's presumption was that quotas were inherently more trade distorting than tariffs because they allowed the user to discriminate between suppliers, were not predictable and transparent to the exporter, and imposed a maximum ceiling on imports. Here, too, exceptions were made to GATT's prohibition of quotas. Member nations could use quotas to safeguard their balance of payments, promote economic development, and allow the operation of domestic agricultural support programs. Voluntary export restraint agreements that used quotas also fell outside the quota restrictions of GATT because the agreements were voluntary.

Predictability: Through Binding and Transparency

Sometimes promising not to increase a trade barrier can be as important as reducing one because the promise provides businesses a clearer view of their future opportunities. Under GATT, when countries agreed to open their markets for goods or services, they would “bind” their commitments. These bindings amounted to ceilings on import tariff rates. For developed countries, the bound rates have generally been the rates actually charged. Most developing countries have bound the rates somewhat higher than the actual rates charged, so the bound rates serve as a ceiling. A country could change its bindings but only after negotiating with its trading partners; that meant compensating them for a loss of trade. The result of this was a much higher degree of market security for traders and investors.

Also, the GATT system tried to improve predictability and stability by making countries' trade rules as clear and public (transparent) as possible. Countries were required to disclose their trade policies and practices publically within the country or by notifying the GATT secretariat.

Multilateral Trade Negotiations

Prior to GATT, trade agreements involved bilateral negotiation between, say, the United States and a single foreign country. With the advent of GATT, trade negotiations were conducted on a multilateral basis that involved all GATT members participating in the negotiations. With the passage of time, GATT evolved to include almost all the main trading nations, although some were nonmembers. Therefore, "multilateral" was used to describe the GATT system instead of "global" or "world." To promote freer trade, GATT sponsored a series of negotiations to reduce tariffs and nontariff trade barriers as summarized in Table 6.2.

TABLE 6.2

GATT Negotiating Rounds

Negotiating Round and Coverage	Dates	Number of Participants	Tariff Cut Achieved (%)
Addressed tariffs			
Geneva	1947	23	21
Annecey	1949	13	2
Torquay	1951	38	3
Geneva	1956	26	4
Dillon Round	1960–1961	26	2
Kennedy Round	1964–1967	62	35
Addressed tariff and nontariff barriers			
Tokyo Round	1973–79	99	33
Uruguay Round	1986–93	125	34
Doha Round	2002–terminated in 2015	149	—

The first round of GATT negotiations, completed in 1947, achieved tariff reductions averaging 21 percent. However, tariff reductions were much smaller in the GATT rounds of the late 1940s and 1950s. During this period, protectionist pressures intensified in the United States as the war-damaged industries of Japan and Europe were reconstructed: The negotiation process was slow and tedious, and nations often were unwilling to consider tariff cuts on many goods.

During the period 1964–1967, GATT members participated in the **Kennedy Round** of trade negotiations, named after U.S. President John F. Kennedy who issued an initiative calling for the negotiations. A multilateral meeting of GATT participants occurred, at which the form of negotiations shifted from a product-by-product format to an across-the-board format. Tariffs were negotiated on broad categories of goods and a given rate reduction applied to the entire group, a more streamlined approach. The Kennedy Round cut tariffs on manufactured goods by an average of 35 percent to an average *ad valorem* level of 10.3 percent.

The GATT rounds from the 1940s to the 1960s focused almost entirely on tariff reduction. As average tariff rates in industrial nations decreased during the postwar period, the importance of nontariff barriers increased. In response to these changes, negotiators shifted emphasis to the issue of nontariff distortions in international trade.

At the **Tokyo Round** of 1973–1979, signatory nations agreed to tariff cuts that took the across-the-board form initiated in the Kennedy Round. The average tariff on manufactured goods of the nine major industrial countries was cut from 7.0 to 4.7 percent, a 39 percent decrease. Tariff reductions on finished products were deeper than those on raw materials, thus tending to decrease the extent of tariff escalation. After the Tokyo Round, tariffs were so low that they were not a significant barrier to trade in industrial countries. A second accomplishment of the Tokyo Round was the agreement to remove or lessen many nontariff barriers. Codes of conduct were established in six areas: customs valuation, import licensing, government procurement, technical barriers to trade (such as product standards), anti-dumping procedures, and countervailing duties.

Despite the trade liberalization efforts of the Tokyo Round, during the 1980s, world leaders felt that the GATT system was weakening. Members of GATT had increasingly used bilateral arrangements such as voluntary export restraints and other trade-distorting actions like subsidies that stemmed from protectionist domestic policies. World leaders also felt that GATT needed to encompass additional areas, such as trade in intellectual property, services, and agriculture. They also wanted GATT to give increasing attention to the developing countries that felt bypassed by previous GATT rounds of trade negotiations.

These concerns led to the **Uruguay Round** from 1986 to 1993. The Uruguay Round achieved across-the-board tariff cuts for industrial countries averaging 40 percent. Tariffs were eliminated entirely in several sectors, including steel, medical equipment, construction equipment, pharmaceuticals, and paper. Many nations agreed for the first time to bind, or cap, a significant portion of their tariffs, giving up the possibility of future rate increases above the bound levels. Progress was also made by the Uruguay Round in decreasing or eliminating nontariff barriers. The government procurement code opened a wider range of markets for signatory nations. The Uruguay Round made extensive efforts to eliminate quotas on agricultural products and required nations to rely instead on tariffs. In the apparel and textile sector, various bilateral quotas were phased out by 2005. The safeguards agreement prohibited the use of voluntary export restraints.

In 1999, members of the WTO (see next section) kicked off a new round of trade negotiations in Seattle, Washington, for the 2000s. The participants established an agenda that included trade in agriculture, intellectual property rights, labor and environmental matters, and help for less developed nations. Believing that they had been taken to the cleaners in previous trade negotiations, developing nations were determined not to allow that to occur again. Disagreements among developing nations and industrial nations were a major factor that resulted in a breakdown of the meetings. The meeting became known as “The Battle in Seattle” because of the rioting and disruption that took place in the streets during the meeting.

Although trade liberalization proponents were discouraged by the collapse of the Seattle meeting, they continued to press for another round of trade talks. The result was the **Doha Round** that was launched in Doha, Qatar, in 2002. The rhetoric of the Doha Round was elaborate: It would decrease trade-distorting subsidies on farm goods; slash manufacturing tariffs by developing countries; cut tariffs on textiles and apparel products that poor countries especially cared about; free up trade in services; and negotiate global rules in four new areas—competition, investment, government procurement, and trade facilitation.

Despite its ambitious aims, the Doha Round showed little progress. The Doha Round immediately encountered difficulties as developing countries refused to accept the central

bargain: large reductions in their industrial tariffs in exchange for greater access to the agricultural markets of the rich nations. Talks faltered in 2003 and finally collapsed in 2015. Skeptics have noted that because the Doha talks were not successful, it may be time to reconsider the size of these huge multilateral rounds and perhaps resort to bilateral trade agreements among a relatively small number of countries as the next best alternative. At the writing of this text, multilateral trade agreements were increasingly giving way to regional ones.

INTERNATIONAL TRADE APPLICATION

Avoiding Trade Barriers during the Great Recession

Global economic downturns are often a catalyst for trade protectionism. As economies shrink, nations have incentives to protect their struggling industries by establishing barriers against imported goods. During the Great Depression of the 1930s, the United States increased import tariffs on some 20,000 goods, which was followed by other countries raising their trade barriers (including tariffs, import quotas, and exchange controls) against the United States. This contributed to a collapse in world trade and a deepening of the global economic slump. However, during the Great Recession of 2007–2009, there was much less resorting to trade barriers than during the Great Depression. Why?



Today, economic historians recognize that the severe protectionism of the 1930s was not simply motivated by the desire for relief from foreign competition. Instead, it was also the result of government officials' reluctance to abandon the gold standard and allow their currencies to depreciate. As discussed in Chapter 15, under the gold standard, a country tied the value of its currency to a particular amount of gold. This meant that the exchange rate between any two currencies on gold was also fixed, which provided businesses certainty about the terms on which international trade would be conducted. Therefore, maintaining the fixed exchange rates of the gold standard was a goal that many governments clung to during the Great Depression.

Many governments were unable to use monetary and fiscal policy to stimulate weak economies; monetary policy was constrained by the gold standard and fiscal policy by the balanced budget doctrine that government spending should be reduced in conjunction with falling tax revenues. Because exchange rate depreciation, monetary policy, and fiscal policy were ruled out as economic adjustment mechanisms, policymakers turned instead to higher trade barriers as a means of restricting imports and bolstering a weak economy. During the 1930s,

governments had relatively few policy instruments, other than protectionism, for dealing with economic downturns; thus the widespread use of protectionism. In contrast, countries that went off the gold standard and allowed their currencies to depreciate did not have to resort to protectionism.

However, by 2007–2009, governments had expanded their arsenal of economic adjustment mechanisms. Many countries had flexible exchange rates, which meant currency depreciation helped reduce trade deficits. Expansionary fiscal and monetary policies were widely used to stimulate weak economies during the Great Recession, although their success is debatable. Countries are much more integrated into the global economy than in the 1930s, and it is widely understood that trade disruptions caused by protectionism would be much more costly. What's more, the composition of the labor force has greatly changed from agriculture and manufacturing to services. This means that fewer workers are directly affected by international trade and the constituency for protectionist policies is smaller than in the past. Finally, countries have signed agreements and are members of institutions such as the World Trade Organization and the North American Free Trade Agreement, which are intended to promote free trade.

Of course, trade protectionism around the globe increased during the Great Recession. However, the protectionist response to this recession was relatively muted.

What do you think? Why do countries sometimes implement increased trade barriers during economic downturns?

Sources: Douglas Irwin, *Trade Policy Disaster: Lessons From the 1930s* (Cambridge, MA: The MIT Press, 2012); Douglas Irwin, *Peddling Protectionism: Smoot Hawley and the Great Depression* (Princeton, NJ: Princeton University Press, 2011); Barry Eichengreen and Douglas Irwin, "The Slide to Protectionism in the Great Depression," *The Journal of Economic History*, Vol. 70, No. 4, December 2010, pp. 871–897.

World Trade Organization

On January 1, 1995, the day that the Uruguay Round took effect, GATT was transformed into the WTO. This transformation turned GATT from a trade accord into a membership organization responsible for governing the conduct of trade relations among its members. The GATT obligations remain at the core of the WTO. However, the WTO agreement requires that its members adhere not only to GATT rules, but also to the broad range of trade pacts that have been negotiated under GATT auspices in recent decades. This undertaking ends the free ride of many GATT members (especially developing countries) that benefited from, but refused to join in, new agreements negotiated in GATT since the 1970s. In 2017, the WTO consisted of 164 nations accounting for over 97 percent of world trade.

How different is the WTO from the old GATT? The WTO is a full-fledged international organization, headquartered in Geneva, Switzerland; the old GATT was basically a provisional treaty serviced by an ad hoc secretariat. The WTO has a far wider scope than the old GATT, bringing into the multilateral trading system for the first time trade in services, intellectual property, and investment. The WTO also administers a unified package of agreements to which all members are committed; in contrast, the GATT framework included many side agreements (for example, antidumping measures and subsidies) among just a few nations. Moreover, the WTO reverses policies of protection in certain “sensitive” areas (agriculture and textiles) that were more or less tolerated in the old GATT. The WTO is not a government; individual nations remain free to set their own appropriate levels of environment, labor, health, and safety protections.

Through various councils and committees, the WTO administers the many agreements contained in the Uruguay Round plus agreements on government procurement and civil aircraft. It oversees the implementation of the tariff cuts and reduction of non-tariff measures agreed to in the negotiations. The WTO is also a watchdog of international trade, regularly examining the trade regimes of individual members. In its various bodies, members flag proposed or draft measures by others that can cause trade conflicts. Members are also required to update various trade measures and statistics that are maintained by the WTO in a large database.

Under the WTO, when members open their markets through the removal of barriers to trade, they “bind” their commitments. Therefore, when they reduce their tariffs through negotiations, they commit to bind the tariff reduction at a fixed level negotiated with their trading partners beyond which tariffs may not be increased. The binding of tariffs in the WTO provides a stable and predictable basis for trade, a fundamental principle underlying the operation of the institution. A provision is made for the renegotiation of bound tariffs. This provision means that a country can increase a tariff if it receives the approval of other countries, which generally requires providing compensation by decreasing other tariffs. Currently, virtually all tariff rates in developed countries are bound, as are about 75 percent of the rates in developing countries.

Settling Trade Disputes

A major objective of the WTO is to strengthen the GATT mechanism for settling trade disputes. The old GATT dispute mechanism suffered from long delays, the ability of accused parties to block decisions of GATT panels that went against them, and inadequate enforcement. The dispute settlement mechanism of the WTO addresses each of these weaknesses. It guarantees the formation of a dispute panel once a case is brought and sets time limits for each stage of the process. The decision of the panel may be taken to a newly

created appellate body, but the accused party can no longer block the final decision. The dispute settlement issue was especially important to the United States because this nation was the most frequent user of the GATT dispute mechanism.

A trade dispute occurs when one member country enacts a trade policy measure or takes some action that one or more fellow members considers to be a violation of WTO agreements or to be a failure to live up to obligations. The WTO's dispute settlement process consists of three broad stages, as summarized below.

- **Consultations.** If a member country feels that a trade policy of another member country is in violation of WTO agreements, it may call for consultations with the other country. Hopefully, the trade dispute will be resolved through consultation. If the dispute is not resolved within 60 days, the complaining country may request the establishment of a WTO dispute panel.
- **Dispute Panel and Appellate Body.** The dispute panel normally consists of three individuals who are appointed by the Secretariat of the WTO. The panel hears the legal written and oral arguments from the disputing countries. After considering these presentations, it issues a report, including its findings concerning possible violation of WTO trade agreements, to the disputing countries and to all WTO members. If the dispute panel declares that a country is in violation of WTO rules, that country may appeal the declaration to the WTO's appellate body which may uphold, modify, or reverse the dispute panel's findings and recommendations. If the dispute panel rules that a member's trade policy violates the WTO and the ruling is upheld on appeal, the violating country has a reasonable period of time to bring the policy into compliance. Only if the violating country fails to act, or the WTO finds that the revised policy continues to violate WTO rules, can the complaining country seek compensation in the form of trade retaliation.
- **Retaliatory Tariffs.** Authorization of retaliatory tariffs arising from a WTO dispute can take four or more years from the time the violation first occurred. Even at the stage at which retaliation is implemented, the WTO does not mandate that the violating country rescind its illegal trade policy. Countries can choose to suffer the costs of trading partner retaliation instead of reforming an illegal trade policy. The WTO uses a trade-effects formula to determine the amount by which the complaining country is allowed to retaliate: The WTO establishes a value of trade that the complaining country is permitted to eliminate as compensation at the end of a dispute if the violating country refuses to reform its policy. The complaining country is then relatively free to decide how to implement the authorized retaliation—that is, what products to target with its retaliatory tariffs. Table 6.3 provides examples of WTO disputes that reached the stage of trade retaliation.

American export subsidies provide an example of retaliatory tariffs authorized by the WTO. From 1984 to 2004, the U.S. tax code provided a tax benefit that enabled American exporters to exempt between 15 and 30 percent of their export income from U.S. taxes. In 1998, the EU lodged a complaint with the WTO arguing that the U.S. tax benefit was an export subsidy in violation of WTO agreements. This complaint led to the WTO's ruling in 2003 that the tax benefit was illegal and the EU could immediately impose \$4 billion in punitive duties on U.S. exports to Europe. Although the EU gave the U.S. government time to eliminate its export subsidy program, inertia resulted in continuation of the program. Europe began implementing retaliatory tariffs in 2004. A 5 percent penalty tariff was levied on U.S. exports such as jewelry, refrigerators, toys, and paper. The penalty climbed by one percentage point for each month U.S. law makers failed

TABLE 6.3**Selected WTO Trade Disputes Resulting in Trade Retaliations**

Year of Alleged Violation	Defendant Country	Award by WTO Arbitrators to Complaining Country
1999	European Union (bananas)	\$191.4 million to United States
1999	European Union (beef hormones)	\$116.8 million United States
2000	United States (foreign sales corporation tax breaks)	\$4.04 billion to European Union
2003	Canada (aircraft credits and guarantees)	\$247.8 million to Brazil
2015	United States (labeling regulations for meat products)	\$805 million to Canada
2015	United States (labeling regulations for meat products)	\$227.8 million to Mexico

Source: Data taken from Chad Brown and Rachel Brewster, "U.S.-Cool Retaliation: The WTO's Article 22.6 Arbitration," *World Trade Review*, Vol. 16, Issue 2, April 2017.

to bring U.S. tax laws in line with the WTO ruling. This tariff marked the first time that the United States came under WTO penalties for failure to adhere to its rulings. Although some in Congress resisted surrendering to the WTO on anything, the pressure provided by the tariffs convinced Congress to repeal the export subsidies.

Since the WTO's trade dispute mechanism was enacted in 1995, WTO members have brought more than 500 formal legal challenges to trading policies under its provisions. The United States has been one of the dispute mechanism's major participants, both as a complaining country and defendant country, simply because it is a major player in international business. In practice, most WTO disputes are resolved without requiring exhaustion of the legal process and the implementation of retaliatory tariffs.

However, critics contend that the WTO's dispute settlement system based on tariff retaliation places smaller countries without much market power at a disadvantage. Suppose that Ecuador, a small country, receives WTO authorization to retaliate against unfair trade practices of the United States, a large country. With competitive conditions, if Ecuador applies a higher tariff to imports from the United States, its national welfare will decrease, as explained in Chapter 4. Therefore, Ecuador may be reluctant to impose a retaliatory tariff even though it has the approval of the WTO.

For countries large enough to affect prices in world markets, the issue is less clear. This is because a retaliatory tariff may improve a large country's terms of trade, thus enhancing its national welfare. If the United States raises a tariff barrier, it reduces the demand for the product on world markets. The decreased demand makes imports less expensive for the United States, so to pay for these imports, the United States can export less. The terms of trade (ratio of export prices to import prices) improves for the United States. This improvement offsets at least some of the welfare reductions that take place through less efficiency because of increasing the tariff.

Although a small country could decide to impose retaliatory tariffs to teach a larger trading partner a lesson, it will find such behavior relatively more costly to initiate than its larger trading partner because it cannot obtain favorable movements in its terms of trade. Therefore, the limited market power of small countries makes them less likely to induce compliance to WTO rulings through retaliation. The problems smaller nations face in retaliating are the opposite of the special benefits they gain in obtaining WTO tariff concessions without being required to make reciprocal concessions.

Some maintain that the WTO's current dispute settlement system should be modified. For example, free traders object to retaliatory tariffs on the grounds that the WTO's purpose is to reduce trade barriers. Instead, they propose that offending countries should be assessed

monetary fines. A system of fines has the advantage of avoiding additional trade protection and not placing smaller countries at a disadvantage. This system encounters the problem of deciding how to place a monetary value on violations. Fines might be difficult to collect because the offending country's government would have to initiate specific budgetary authorization. The notion of accepting an obligation to allow foreigners to levy monetary fines on a nation such as the United States would likely be criticized as taxation without representation, and the WTO would be attacked as undermining national sovereignty.

Does the WTO Reduce National Sovereignty?

Do WTO rules or dispute settlements reduce the sovereignty of the United States or other countries? The United States benefits from WTO dispute settlement by having a set of rules that it can use to hold other countries accountable for their trade actions. At the same time, the U.S. government was careful to structure the WTO dispute settlement rules to preserve the rights of Americans. Nevertheless, critics on both the left and right, such as Ralph Nader and Patrick Buchanan, contend that by participating in the WTO the United States has seriously undermined its sovereignty.

Proponents note that the findings of a WTO dispute settlement panel cannot force the United States to change its laws. Only the United States determines exactly how it will respond to the recommendations of a WTO panel, if at all. If a U.S. measure is found to be in violation of a WTO provision, the United States may, on its own, decide to change the law, compensate a foreign country by lowering its trade barriers of equivalent amount in another sector, or do nothing and possibly undergo retaliation by the affected country in the form of increased barriers to U.S. exports of an equivalent amount. America retains full sovereignty in its decision of whether or not to implement a panel recommendation. WTO agreements do not preclude the United States from establishing and maintaining its own laws or limit the ability of the United States to set its environmental, labor, health, and safety standards at the level it considers appropriate. The WTO does not allow a nation to use trade restrictions to enforce its own environmental, labor, health, and safety standards when they have selective and discriminatory effects against foreign producers.

Economists generally agree that the real issue raised by the WTO is not whether it decreases national sovereignty, but whether the specific obligations it imposes on a nation are greater or less than the benefits the nation receives from applying the same requirements to others (along with itself). According to this standard, the benefits to the United States of joining the WTO greatly exceed the costs. By granting the United States the status of normal trade relations with all 153 members, the agreement improves U.S. access to foreign markets. Moreover, it reduces the ability of other nations to impose restrictions to limit access to their markets. If the United States withdrew from the WTO it would lose the ability to use the WTO mechanism to induce other nations to decrease their own trade barriers and would harm U.S. exporting firms and their workers. Economists generally contend that the WTO puts some constraints on the decision making of the private and public sectors, but the costs of these constraints are outweighed by the economic benefits that citizens derive from freer trade.

Does the WTO Harm the Environment?

In recent years, the debate has intensified on the links between trade and the environment and the role that the WTO should play in promoting environment-friendly trade. A central concern of those who have raised the profile of this issue in the WTO is that there are circumstances in which trade and the pursuit of trade liberalization may have harmful environmental effects. Indeed, these concerns were voiced when thousands of environmentalists descended on the WTO summit in Seattle in 1999. They protested the WTO's influence

on everything from marine destruction to global warming. Let us consider the opposing views on the links between trade and the environment.²

Harming the Environment

Two main arguments are made as to how trade liberalization may harm the environment. First, trade liberalization leads to a “race to the bottom” in environmental standards. If some countries have low environmental standards, industry is likely to shift production of environmentally intensive or highly polluting products to such pollution havens. Trade liberalization can make the shift of smokestack industries across borders to pollution havens even more attractive. If these industries then create pollution with globally adverse effects, trade liberalization can, indirectly, promote environmental degradation. Worse, trade-induced competitive pressure may force countries to lower their environmental standards, encouraging trade in products creating global pollution.

Why would developing nations adopt less stringent environmental policies than industrial nations? Poorer nations may place a higher priority on the benefits of natural processes (such as Latin America’s rain forest capacity to reduce carbon dioxide in the air) than do industrial nations that suffer from the effects of past pollution. Developing nations can tolerate higher levels of emissions without increasing pollution levels. The introduction of a polluting industry into a sparsely populated developing nation will likely have less impact on the capacity of the environment to reduce pollution by natural processes than it would have in a densely populated industrial nation.

A second concern of environmentalists about the role of trade relates to social preferences. Some practices may simply be unacceptable for certain people or societies so they oppose trade in products that encourage such practices. These practices can include killing dolphins in the process of catching tuna and using leg-hold traps for catching animals for their furs. During the 1990s, environmentalists and the WTO clashed when the WTO ruled against a U.S. ban on the import of shrimp from countries using nets that trap turtles after complaints by India, Malaysia, Pakistan, and Thailand. The United States was found guilty of violating world trade law when it banned imports of Mexican tuna caught in ways that drown dolphins. Indeed, critics maintained that the free-trade policies of the WTO contradicted the goal of environmental quality.

To most economists, any measure that liberalizes trade enhances productivity and growth, puts downward pressure on inflation by increasing competition, and creates jobs. In Japan, tariffs are so high on imported finished wood products that U.S. firms don’t have much of a market there. High local prices limit domestic demand in Japan. If tariffs were abolished, demand for lumber products from the United States could surge, creating additional logging jobs in the United States and additional import-related jobs in Japan.

But environmentalists view the tariff elimination differently. Their main concern is that a nontariff market that would result in lower prices would stimulate so much demand that logging would intensify in the world’s remaining ancient forests, which they say serve as habitat for complex ecosystems that would otherwise not survive intact in forests that have been cut into fragments. Such old forests still exist across much of Alaska, Canada, and Russia’s Siberian region. Environmentalists note that in Pennsylvania, New York, and other states in the Northeast, the forests have been so chopped up that many large predators have been driven from the land, leaving virtually no check on the deer population. Deer are in a state of overpopulation.

²World Trade Organization, Annual Report, Geneva, Switzerland, 1998, pp. 54–55; and “Greens Target WTO’s Plan for Lumber,” *The Wall Street Journal*, November 24, 1999, pp. A2 and A4.

Trade liberalization proponents play down the adverse impacts, arguing that reduced tariffs would boost world economies by decreasing the cost of housing, paper, and other products made from wood, while actually helping forest conditions. Timber officials in the United States say they could go into a country like Indonesia and persuade local firms to adopt more conservation-minded techniques.

Improving the Environment

On the other hand, it is argued that trade liberalization may improve the quality of the environment rather than promote degradation. First, trade stimulates economic growth, and growing prosperity is one of the key factors in societies' demand for a cleaner environment. As people get richer, they want a cleaner environment—and they acquire the means to pay for it. Granted, trade can increase the cost of the wrong environmental policies. If farmers freely pollute rivers, higher agricultural exports will increase pollution. The solution to this is not to shut off exports, but rather, it is to impose tougher environmental laws that make polluters pay.

Second, trade and growth can encourage the development and dissemination of environmentally friendly production techniques as the demand for cleaner products grows and trade increases the size of markets. International companies may also contribute to a cleaner environment by using the most modern and environmentally clean technology in all their operations. This is less costly than using differentiated technology based on the location of production and helps companies to maintain a good reputation.

Although there is no dispute that, in theory, intensified competition could give rise to pollution havens, the empirical evidence suggests that it has not happened on a significant scale. The main reason is that the costs imposed by environmental regulation are small relative to other cost considerations, so this factor is unlikely to be at the basis of relocation decisions. The U.S. Census Bureau finds that even the most polluting industries spend no more than 2 percent of their revenues on abating pollution. Other factors such as labor costs, transportation costs, and the adequacy of infrastructure are much more costly. For all the talk of a race to the bottom, there is no evidence of a competitive lowering of environmental standards.

WTO Rules against China's Hoarding of Rare Earth Metals

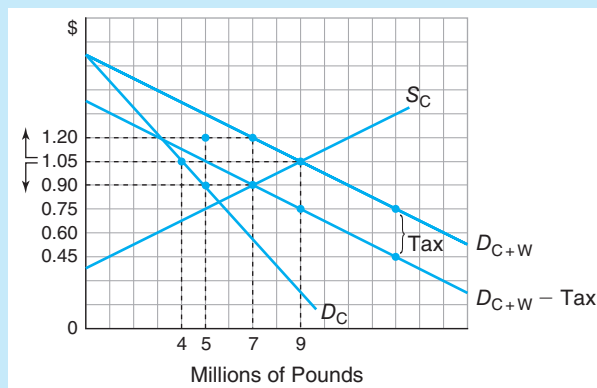
China's trade policy on rare earth metals (industrial raw materials) provides an example of the WTO's involvement of trade and the environment. In 2011, the WTO ruled that China had no legal right to impose export restrictions on nine rare earth metals, such as zinc and manganese, which are crucial to the production of high-technology goods from fiber optic cables to smart phones, electric cars, computer monitors, and weapons. China had been using export tariffs and export quotas to reduce overseas sales of these essential resources. China is a "large country" in rare earth metals, accounting for almost 97 percent of the world's output.

Why would a country restrict the export of raw materials and decrease the world supply? By restricting export sales, the supply of raw materials in the domestic market will increase, reducing the price faced by domestic buyers. By limiting the export of a good and decreasing world supply, the world price of the export good may be driven upward, improving the exporting country's terms of trade. The exporting country may want to conserve a scarce resource. Export limitations on raw materials would increase the domestic manufacturers' access to raw materials needed in production and also hold down the cost of these inputs, giving them a competitive advantage in global markets.

Figure 6.2 illustrates the effects of Chinese export tariffs applied to zinc, a rare earth metal. Assume that China produces a large share of the total world output of zinc. In the

FIGURE 6.2

China's Export Restrictions on Raw Materials



China's export restrictions on raw materials would guarantee Chinese manufacturers access to the raw materials needed in processing, as well as holding down the cost of these inputs to Chinese manufacturers. Also, the export restrictions would drive up the prices of raw materials used by foreign manufacturers that compete against the Chinese, placing them at a competitive disadvantage.

figure, S_C denotes China's domestic supply curve, D_C its domestic demand curve, and D_{C+W} the total world demand curve for zinc. The distance between D_C and D_{C+W} at each price represents the rest of the world's demand for zinc. Equilibrium is reached where supply curve S_C intersects demand curve D_{C+W} . At this point, China would produce 9 million pounds, of which 4 million pounds are sold domestically and 5 million pounds are exported. A price of \$1.05 would apply to both domestic sales and exports.

Now assume China imposes a tax of \$0.30 on each pound of zinc that is exported. A tax on foreign buyers decreases the amount they are willing to pay Chinese sellers, so the demand curve shifts downward, from D_{C+W} to $D_{C+W(\text{Tax})}$. Equilibrium occurs where the new demand curve intersects the supply curve at a quantity of 7 million pounds, with 5 million pounds sold in China and 2 million pounds exported abroad. Foreign consumers pay \$1.20 per pound; this includes the lower price of \$0.90 going to Chinese producers and \$0.30 going to the Chinese government as tax revenue. However, Chinese consumers pay only \$0.90 per pound because the export tax does not apply to them. China's export tax on zinc results in a combination of a lower domestic price and a higher world price. An alternative scheme for restricting exports is the implementation of an export quota that can yield the same effects on prices and volume.

Concerning the environment, China does not impose stringent regulations on mining rare earths like many other countries do. In China, the waste from rare earth mining is pumped into artificial ponds with earthen dams where the seepage and waste has caused health-related issues. The lack of stringent environmental regulations gives China's producers a cost advantage compared to their foreign competitors.

In defending its trade policy, China contended that its export restrictions are essential to protect its environment and scarce resources. WTO rules allow export controls for environmental reasons as long as such measures are made effective in conjunction with restrictions

on domestic production or consumption. Such restrictions cannot be used to discriminate against users and refiners of materials in other nations.

The United States and other complainants in the natural resource case maintained that China's export restrictions were a discriminatory protectionist policy. The effect of these restrictions was to reduce the supply of key resources abroad and drive up world prices higher than China's domestic prices. This disadvantaged foreign producers that used these resources as inputs and that competed against the Chinese. Steps to limit sales of raw materials abroad were seen as a bid by China to attract more manufacturing to its shores. The WTO ruling was a setback to China's policy of hoarding rare earth metals. In response to the ruling, China said that it would make modifications to its export controls to avoid penalties.

By 2016, China's attempt to control the market for rare earth metals was dwindling. New supplies for many minerals were appearing as uncertainty over China's reliability and a period of higher prices stimulated investment in new mining projects elsewhere, such as Greenland and Russia.

Future of the World Trade Organization

The failure of the Doha Round to achieve a successful multilateral trade agreement has led some observers to question whether the WTO's principle of nondiscriminatory trade applies in today's world. Although much trade between major economies is still conducted on a nondiscriminatory basis (most favored nation principle), there is also a "spaghetti bowl" of regional and bilateral trade deals. In recent years, multilateral trade pacts have been increasingly giving way to regional ones, and the structure of world trade has evolved toward a more fragmented system.

A major barrier to multilateral trade deals is the evolving balance of world economic power. Brazil, Russia, India, and China (the BRICs) visualize themselves as countries still poor enough to need protection for their industries while the rich should reduce their own trade barriers, especially to agriculture. The rich countries generally consider the BRICs as major economic competitors whose state capitalism is not compatible with a free and open world economy. Also, trade liberalization now proceeds along two different tracks. One, favored by the United States, attempts to enforce environmental and labor protection; harmonize health, safety, and technical standards; and address the protection of intellectual property. The other track, desired by China, emphasizes decreasing tariffs outside sensitive sectors. It is difficult to achieve a multilateral trade agreement when the views of negotiating countries greatly differ.

Perhaps the WTO is a victim of its own success. Thanks to previous rounds of tariff reductions, further liberalization offers progressively less economic benefit. Countries may have less incentive to pursue trade liberalization according to the WTO approach. The decline of the WTO's concept of multilateralism may not greatly affect large countries that can negotiate regional agreements to their own advantage. Small countries without much bargaining power may be disadvantaged.³

Many observers note that the WTO needs to change its way of achieving trade liberalization, which has sought grand bargains covering many industries. Instead, the WTO should pursue modest trade deals that cover specific industries. For example, it should seek a deal on cotton rather than combining various bits of farming with customs facilitation. Also, the WTO should attempt to get each deal completed in a matter of months, not years. Put simply, it is better to have some small trade deals than none at all.

³Greg Ip, "The Gated Globe," *The Economist*, October 12, 2013, pp. 3–20.

Trade Promotion Authority (Fast Track Authority)

If international trade agreements were subject to congressional amendments, achieving such pacts would be arduous, if not hopeless. The provisions that had been negotiated by the president would soon be modified by a deluge of congressional amendments that would quickly meet the disapproval of the trading partner(s) that accepted the original terms.

To prevent this scenario, the mechanism of **trade promotion authority** (also known as **fast track authority**) was devised in 1974. Under this provision, the president must formally notify Congress of his/her intent to enter trade negotiations with another country. This notification starts a clock in which Congress has 60 legislative days to permit or deny “fast track” authority. If fast track authority is approved, the president has a limited time period to complete the trade negotiations; extensions of this time period are permissible with congressional approval. Once the negotiations are completed, their outcome is subject only to a straight up-or-down vote (without amendment) in both houses of Congress within 90 legislative days of submission. In return, the president agrees to consult actively with Congress and the private sector throughout the negotiation of the trade agreement.

Fast track authority was instrumental in negotiating and implementing major trade agreements such as the Uruguay Round Agreements Act of 1994 and the North American Free Trade Agreement of 1993. Most analysts contend that the implementation of future trade agreements will require fast track authority for the president. Efforts to renew fast track authority have faced stiff opposition, largely due to congressional concerns about delegating too much discretionary authority to the president and disagreements over the goals of U.S. trade negotiations. In particular, labor unions and environmentalists have sought to ensure that trade agreements will address their concerns. They believe that high labor and environmental standards in the United States put American producers at a competitive disadvantage and that increased trade with countries with lax standards may lead to pressure to lower U.S. standards. If other countries are to trade with the United States, shouldn't they have similar labor and environmental standards?

Supporters of fast track authority have generally argued that, although labor and environmental standards are important, they do not belong in a trade agreement. Instead, these issues should be negotiated through secondary agreements that accompany a trade agreement. Labor leaders and environmentalists contend that past secondary agreements have lacked enforcement provisions and have done little to improve the quality of life abroad.

Safeguards (The Escape Clause): Emergency Protection from Imports

In addition to the WTO's addressing of unfair trade practices, the United States itself has adopted a series of **trade remedy laws** designed to produce a fair trading environment for all parties engaging in international trade. These laws include the escape clause, countervailing duties, antidumping duties, and unfair trading practices. Table 6.4 summarizes the provisions of the U.S. trade remedy laws that are discussed in the following sections.

The **escape clause** provides temporary **safeguards** (relief) to U.S. firms and workers who are substantially injured from surges in imports that are fairly traded. To offset surging imports, the escape clause allows the president to terminate or make modifications in trade concessions granted foreign nations and to levy trade restrictions. The most common form of relief is tariff increases, followed by tariff rate quotas and trade adjustment assistance. Import relief can be enacted for an initial period of four years and extended for another four years. The temporary nature of safeguards is to give the domestic industry time to adjust to

TABLE 6.4

Trade Remedy Law Provisions

Statute	Focus	Criteria for Action	Response
Fair trade (escape clause)	Increasing imports	Increasing imports are substantial cause of injury	Duties, quotas, tariff-rate quotas, orderly marketing arrangements, adjustment assistance
Subsidized imports (countervailing duty)	Manufacturing production, or export subsidies	Material injury or threat of material injury	Duties
Dumped imports (antidumping duty)	Imports sold below cost of production or below foreign market price	Material injury or threat of material injury	Duties
Unfair trade (Section 301)	Foreign practices violating a trade agreement or injurious to U.S. trade	Unjustifiable, unreasonable, or discriminatory practices, burdensome to U.S. commerce	All appropriate and feasible action

import competition. It is common for safeguards to decline during the period in which they are imposed so as to gradually wean the domestic industry from protectionism.

An escape clause action is initiated by a petition from an American industry to the U.S. International Trade Commission (USITC), which investigates and recommends a response to the president. To receive relief, the industry must demonstrate that it has been substantially injured by foreign competition. The industry must also prepare a statement that shows how safeguards will help it adjust to import competition. An affirmative decision by the USITC is reported to the president who determines what remedy is in the national interest. Because safeguard protection can be applied broadly to imports all over the world, rather than to imports to a specific country, it is intended to offer American companies a bigger defense against foreign competition than the more widely used antidumping and antisubsidy laws which generally apply to imports from a particular country.

Most recipients of safeguard relief come from manufacturing, such as footwear, steel, fishing tackle and rods, and clothespins. Agricultural products are the second largest category, including asparagus, mushrooms, shrimp, honey, and cut flowers. Table 6.5 provides examples of safeguard relief granted to U.S. industries.

TABLE 6.5

Safeguard Relief Granted Under the Escape Clause: Selected Examples

Product	Type of Relief
Porcelain-on-steel cooking ware	Additional duties imposed for four years of \$0.20, \$0.20, \$0.15, and \$0.10 per pound in the first, second, third, and fourth years, respectively
Prepared or preserved mushrooms	Additional duties imposed for three years of 20%, 15%, and 10% ad valorem in the first, second, and third years, respectively
High-carbon ferrochromium	Temporary duty increase
Color TV receivers	Orderly marketing agreements with Taiwan and Korea
Footwear	Orderly marketing agreements with Taiwan and Korea

Source: From *Annual Report of the President of the United States on the Trade Agreements Program*, Washington, DC, Government Printing Office, various issues.

Although safeguard relief was invoked often during the 1970s, in recent decades it has been rarely used. This is partly because safeguard relief has proven to be a difficult way to win protection against imports because presidential action is required for it to be granted, and presidents have often been reluctant to grant such relief. Instead, safeguard relief has been overshadowed by antidumping duties, whose implementation does not require presidential action and whose injury standards are not as stringent.

One argument for safeguard provisions is that they are a political necessity for the formation of agreements to liberalize trade. Without the assurance of a safety net to protect domestic producers from surging imports, trade liberalization agreements would be impossible to achieve. Another argument for safeguards is a more practical political argument. Governments appease domestic producers that maintain strong lobbying power, even at the detriment of foreign producers of like products, simply because the domestic producers are voting constituents. It is argued that a better solution to the pressure on domestic producers is to impose these temporary measures from time to time to reduce strain on the industry rather than to take any permanent action that might dismantle liberal trade policies in general. The problem with this justification is that there are usually other possible ways to reduce this pressure that do not involve restrictions on imports to the disadvantage of foreign producers, such as government aid and tax relief.

U.S. Safeguards Limit Surging Imports of Textiles from China

Surging textile exports from China to the United States provide an example of how safeguards can be used to stabilize a market. Producers of textiles and apparel have benefitted from some of the most substantial and long-lasting trade protection granted by the U.S. government in recent times. In 1974, the United States and Europe negotiated a system of rules to restrict competition from developing exporting countries employing low-cost labor. Known as the **Multifiber Arrangement (MFA)**, quotas were negotiated each year on a country-by-country basis, assigning the quantities of specific textile and apparel items that could be exported from developing countries to the industrial countries. Although the MFA was initially intended as a short-term measure to give industrialized countries time to adjust to the rigors of global competition, because of extensions, it lasted until 2005.

The MFA helped create textile and apparel industries in some countries where these sectors would likely not have emerged on their own, simply because these countries were granted rights to export. Impoverished countries such as Bangladesh, Cambodia, and Costa Rica grew to rely on garment exports as a means of providing jobs and income for their people. Without the MFA, many developing countries that benefitted from the quotas might have lost out in a more competitive environment.

When the MFA came to an end in 2005, importers were allowed to buy textile products in any volume from any country. This affected the geographic distribution of industrial production in favor of China, the world's lowest cost and largest supplier of textile products. China was poised to become the main beneficiary of trade liberalization under the removal of the quota.

The superior competitive position of China resulted in its textile and apparel exports surging to the markets of Europe and the United States in 2005. To soften the shock wave, the Chinese government took voluntary measures including strengthening self-discipline among its textile exporters, curbing investment in the sector, and encouraging big textile companies to invest abroad. The government also added an export tax to reduce the competitiveness of 148 textile and apparel products in foreign markets. Nevertheless, Chinese exports continued to flow rapidly to the markets of the United States and Europe.

Alarmed that Chinese garments might overwhelm domestic producers, the U.S. government imposed safeguard quotas that restricted the rise in imports to 7.5 percent on Chinese trousers, shirts, and underwear. In November 2005, the safeguard quotas were

replaced by a textile agreement with China that imposed annual limits on 34 categories of clothing running through 2008. Economists estimated that the restrictions would drive up clothing prices between \$3 billion and \$6 billion annually, an amount that would translate into \$10 to \$20 higher bills for the average U.S. family.

Countervailing Duties: Protection against Foreign Export Subsidies

As consumers, we tend to appreciate the low prices of foreign subsidized steel. Foreign export subsidies are resented by import-competing producers who must charge higher prices because they do not receive such subsidies. From their point of view, the export subsidies give foreign producers an unfair competitive advantage.

As viewed by the WTO, export subsidies constitute unfair competition. Importing countries can retaliate by levying a **countervailing duty**. The size of the duty is limited to the amount of the foreign export subsidy. Its purpose is to increase the price of the imported good to its fair market value.

Upon receipt of a petition from a U.S. industry or firm, the U.S. Department of Commerce will conduct a preliminary investigation as to whether or not an export subsidy was given to a foreign producer. If the preliminary investigation finds a reasonable indication of an export subsidy, U.S. importers must immediately pay a special tariff (equal to the estimated subsidy margin) on all imports of the product in question. The Commerce Department then conducts a final investigation to determine whether an export subsidy was in fact granted, as well as the amount of the subsidy. If it determines that there was no export subsidy, the special tariff is rebated to the U.S. importers. Otherwise, the case is investigated by the U.S. International Trade Commission, which determines if the import-competing industry suffered material injury as a result of the subsidy.⁴ If both the Commerce Department and the International Trade Commission rule in favor of the subsidy petition, a permanent countervailing duty is imposed that equals the size of the subsidy margin calculated by the Commerce Department in its final investigation. Once the foreign nation stops subsidizing exports of that product, the countervailing duty is removed.

Countervailing Duties: Trade Disputes between Canada and the United States

For decades, the United States and Canada have tussled over trade in tree products. During the 1980s and 1990s, the two nations were sparring over softwood lumber. By 2015, the dispute turned to glossy paper used in magazines and advertisements. Let us consider these trade cases.

Lumber Imports from Canada Lumber producers in the United States have often complained that they are disadvantaged by subsidies that the Canadian government provide its lumber producers. The lumber dispute has followed a repetitive pattern. U.S. lumber producers allege that Canadian producers pay unfairly low tree cutting fees to harvest timber from lands owned by the Canadian government. In the United States, lumber producers pay higher fees for the right to cut trees in government forests. Canadian

⁴For those nations that are signatories to the WTO Subsidy Code, the International Trade Commission must determine that their export subsidies have injured U.S. producers before countervailing duties are imposed. The export subsidies of nonsignatory nations are subject to countervailing duties immediately following the Commerce Department's determination of their occurrence; the International Trade Commission does not have to make an injury determination.

regulations permit provincial governments to reduce their tree cutting fees when lumber prices decline to keep Canadian sawmills profitable. To U.S. producers, this amounts to an unfair export subsidy granted to their Canadian competitors. Therefore, trade restrictions are the appropriate policy for offsetting the competitive disadvantage of U.S. lumber producers. However, Canadian producers complain that they do not receive illegal subsidies and that such trade restrictions are unfair and violate international trade rules.

For example, in 1996, the Coalition for Fair Lumber Imports, a group of U.S. sawmill companies, won a countervailing duty petition with the U.S. government charging that domestic lumber companies were hurt by subsidized exports from Canada. The complaint led to the imposition of a tariff-rate quota to protect U.S. producers. According to the trade restraint, up to 14.7 billion board feet of Canadian lumber exports from Canada to the United States could enter duty free. The next 0.65 billion board feet of exports was subject to a tariff of \$50 per thousand board feet. The Canadian government also agreed to raise the tree cutting fees it charged provincial producers. The result was that Canadian lumber exports to the United States fell about 14 percent. Although the trade restriction benefitted American lumber producers, critics argued that it failed to take into account the interests of American lumber users in the lumber dealing, homebuilding, and home furnishing industries. It also overlooked the interests of American buyers of new homes and home furnishings according to the critics. They noted that the trade restrictions increased the price of lumber from 20 to 35 percent; thus, the cost of the average new home increased from \$800 to \$1,300.⁵

In order to resolve the lumber trade dispute, the governments of the United States and Canada announced the Softwood Lumber Agreement in 2006. Under the agreement, export charges or quota limitations were levied on Canadian softwood lumber shipped to the United States when the price of U.S. softwood lumber products fell below a specified level. Also, the United States would not self-initiate an antidumping or countervailing duty investigation with respect to imports of softwood lumber products from Canada. Thus, the agreement represented a compromise between lumber producers of Canada and the United States. In 2015, the Softwood Lumber Agreement expired.

In 2017, failure to reach a new lumber agreement with Canada led to President Donald Trump's slapping tariffs of up to 24 percent on Canadian lumber shipped into the United States. Trump noted that the tariffs were intended to create a level playing field for American lumber companies—that is, the tariffs were commensurate to the subsidies the Canadian companies received from the Canadian government. Canada vigorously denied that it subsidizes its lumber companies. At the writing of this textbook, it remained to be seen how this trade dispute would be resolved.

Glossy Paper Imports from Canada Another trade dispute between Canada and the United States involved glossy paper (known as supercalendered paper) from Canadian mills. In 2015, Canadian mills exported about three-fourths of their glossy paper to the United States, valued at \$850 million, and were able to capture about 60 percent of America's market. As demand dropped, the profitability of the American mills fell and layoffs were occurring for American paper workers.

This led to two American paper mills filing a complaint with the U.S. government—Madison Paper Industries (Maine) and Verso Corporation (Ohio). They alleged that the Canadian mills received illegal subsidies from their government, giving them an unfair price advantage in the sale of glossy paper. The complaint was also supported by the labor unions which represented workers at Madison and Verso.

⁵Brink Lindsey, Mark Groombridge, and Prakash Loungani, *Nailing the Homeowner: The Economic Impact of Trade Protection of the Softwood Lumber Industry*, CATO Institute, July 6, 2000, pp. 5–8.

The complaint was first reviewed by the U.S. Department of Commerce which determined that illegal subsidies did occur. The subsidies included the Canadian government's approving loans at artificially low interest rates and a special discount that the Canadian mills received on their purchases of electricity, as approved by the Canadian government. Energy tends to be a paper mill's largest expense.

The Commerce Department determined that the subsidy rates ranged from 17.87 to 20.18 percent for the various Canadian mills. As a result of this finding, the Commerce Department ordered the implementation of countervailing duties (tariffs) equal to the subsidy rates. Also, Canadian paper exporters were ordered to make a cash deposit, with the U.S. government, for the countervailing duties.

After the Department of Commerce determined that illegal subsidies occurred, the complaint went to the U.S. International Trade Commission which was charged with determining whether or not the subsidies caused material injury, or threatened material injury, to the American paper mills. The International Trade Commission found that the Canadian subsidies caused significant injury to these mills in the form of lost sales and profits as well as job losses for their workers. If the International Trade Commission issued a negative injury determination, the investigation would have been terminated. Therefore, the countervailing duties would have been canceled and all cash deposits already collected from Canadian paper mills would have been refunded. However, this did not occur.

Workers at the struggling American paper mills cheered in 2015 when the Commerce Department implemented countervailing duties on glossy paper made in Canada. However, the duties were not enough. Months later, Madison Paper Industries closed its mill in Maine and laid off more than 200 workers. It was the fifth paper mill to shut down in Maine in two years.

The Canadian paper mills were outraged by countervailing duties, claiming that they did not receive illegal subsidies. In particular, the Canadian mills denied that they received subsidies from the Canadian government on the grounds that the discounted electricity rates were negotiated with a private electricity company, and thus it was not a government subsidy that was subject to countervailing duties. The Canadian mills vowed that they would challenge the U.S. countervailing duties under the rules of the North American Free Trade Agreement and the World Trade Organization. At the writing of this text, it remains to be seen how this case will be resolved.⁶

INTERNATIONAL TRADE APPLICATION

Would a Carbon Tariff Help Solve the Climate Problem?

Many scientists consider carbon dioxide to be a contributor to global warming. This colorless, odorless gas is released into the environment whenever oil, coal, and other fossil fuels are burned. Among the policies to reduce the consumption of fossil fuels are annual limits placed on the number of tons of a pollutant that a firm can emit into the atmosphere and a tax



placed on each ton of pollutant that a firm emits. These policies especially raise the cost of pollution for carbon dioxide-intensive industries such as steel, aluminum, chemicals, paper, and cement.

The issue of economic competitiveness has been a sticking point in global negotiations to reduce emissions. If the United States independently raises the penalty for

(continued)

⁶U.S. International Trade Commission, *Supercalendered Paper from Canada*, Washington, DC, December, 2015; and U.S. Department of Commerce, *Commerce Finds Countervailable Subsidization of Imports of Supercalendered Paper from Canada*, Washington, DC, October 14, 2015.

carbon dioxide emissions by imposing emission caps or taxes, its producers will be at a competitive disadvantage because the cost of regulating carbon dioxide will be embodied in the overall price of goods—increasing costs relative to goods produced in countries with little or no carbon dioxide regulations. Instead of paying these higher costs, U.S. firms might relocate to countries with lower pollution enforcement standards, thus costing Americans jobs while failing to decrease global emissions.

One way to protect American firms would be to place a “carbon tariff” on goods that are imported from nations that have less strict regulations to limit their carbon dioxide emissions. Presumably, the tariff would be higher on imports from polluting nations such as China than on imports from energy-efficient Brazil. Proponents of carbon tariffs maintain that by increasing the price of imported goods, a tariff would protect domestic industries from the competitive disadvantage they incur when adhering to pollution regulations. They also contend that a carbon tariff provides an incentive for other countries to enact pollution regulations.

There are several arguments against imposing a carbon tariff. First, this sort of tariff would be hard to implement because of lack of knowledge about the carbon dioxide content of imports. Customs officials would have to know precisely how much steel is in each automobile and where and how every bit of that steel is produced, which would be a difficult task. An automobile from Indonesia made of steel imported from energy-efficient Germany should

presumably be taxed at a different rate than the same Indonesian model made of steel from energy-inefficient China. This would be tough.

Another argument against enacting carbon tariffs is that they might result in a trade war with damaging effects for domestic industry: They target developing countries whose cooperation is essential for global climate policy. The legitimacy of carbon tariffs under the rules of the World Trade Organization (WTO) is uncertain. The principle of free trade, as promoted by the WTO, suggests that countries should make goods that embody their comparative advantage. Imposing a carbon tariff to discourage carbon-intensive producers works against the principle of comparative advantage for countries such as China and India that would likely challenge it at the WTO. Carbon tariffs might be found to be illegal by the WTO, depending on how they are implemented.

Indeed, there are many practical and political complexities of implementing carbon tariffs. It remains to be seen whether they will become a major part of global climate policy.

What do you think? Do you feel that carbon tariffs should be placed on imported goods?

Sources: “Can Trade Restrictions Be Justified on Environmental Grounds?” *The Economist*, February 23, 2013; David Drake, *Carbon Tariffs*, Working Paper 12–29, Harvard Business School, October 19, 2011; Tim Wilson and Caitlin Brown, *Costly, Ineffective and Protectionist Carbon Tariffs*, Institute of Public Affairs, Melbourne, Australia, 2010; Olive Heffernan, *Would a Carbon Tariff Even Work?* (London: Nature Publishing Group, Macmillan Publishers Limited, January 2010).

Antidumping Duties: Protection against Foreign Dumping

In recent years, relatively few American firms have chosen to go through the cumbersome process of obtaining relief through countervailing duties. Instead, they have found another way to obtain protection against imports: They have found it much easier to accuse foreign firms of dumping in the U.S. market and convince the U.S. government to impose antidumping duties on these goods. From the perspective of American firms trying to obtain protection from imports, antidumping is where the action is.

The objective of U.S. antidumping policy is to offset two unfair trading practices by foreign nations: export sales in the United States at prices below the average total cost of production, and price discrimination in which foreign firms sell in the United States at a price less than that charged in the exporter’s home market. Both practices can inflict economic hardship on U.S. import-competing producers; by reducing the price of the foreign export in the U.S. market, they encourage U.S. consumers to buy a smaller quantity of the domestically produced good.

Antidumping investigations are initiated upon a written request by the import-competing industry that includes evidence of (1) dumping; (2) material injury, such as lost sales, profits, or jobs; and (3) a link between the dumped imports and the alleged injury. Antidumping investigations commonly involve requests that foreign exporters and domestic importers fill out detailed questionnaires. Parties that elect not to complete questionnaires can be put at a disadvantage with respect to case decisions; findings are made on the best information available, which may simply be information supplied by the domestic industry in support of the dumping allegation. The number of antidumping cases dwarfs those of other trade remedies. The Commerce Department determines whether dumping did occur, and the International Trade Commission determines whether the domestic industry was harmed because of dumping.

If these agencies determine that dumping is occurring and is causing material injury to the domestic industry, then the U.S. response is to impose an antidumping duty (tariff) on dumped imports equal to the margin of dumping. The effect of the duty is to offset the extent to which the dumped goods' prices fall below average total cost, or below the price at which they are sold in the exporter's home market. Antidumping duties are generally large, often in the neighborhood of 60 percent. According to the International Trade Commission, imports subject to antidumping duties of over 50 percent tend to increase by 33 percent in price and decrease by 73 percent in volume as compared to the year prior to the petition for antidumping duties.⁷

An antidumping case can be terminated prior to conclusion of the investigation if the exporter of the product to the United States agrees to cease dumping, stop exporting the product to the United States, increase the price to eliminate the dumping, or negotiate some other agreement that will decrease the quantity of imports. Indeed, the mere threat of an antidumping investigation may induce foreign companies to increase their export prices and thus to stop any dumping they were practicing.

Are antidumping laws good for a nation? Economists tend to be dubious of antidumping duties because they increase the price of imported goods and decrease consumer welfare. According to economic analysis, low prices are a problem in need of remedy only if they tend to result in higher prices in the long run. Economists generally consider antidumping duties appropriate only when they combat predatory pricing designed to monopolize a market by knocking competitors out of business. The consensus among economists is that antidumping laws have virtually nothing to do with addressing predatory pricing, so their existence is without economic justification.

Supporters of antidumping laws admit that they are not intended to combat predatory pricing or to enhance consumer welfare in the economists' definition of the term. However, they justify antidumping laws, not on the criterion of efficiency, but on the criterion of fairness. Even though dumping may benefit consumers in the short run, they contend that it is unfair for domestic producers to have to compete with unfairly traded goods.

Remedies against Dumped and Subsidized Imports

Recall that the direct effect of dumping and subsidizing imports is to lower import prices, an effect that provides benefits and costs for the importing country. There are benefits to consumers if imports are finished goods and to consuming industries that use imports as intermediate inputs into their own production (*downstream* industry). Conversely, there are costs to the import-competing industry, its workers, and other domestic industries selling intermediate inputs to production of the import-competing industry (*upstream*

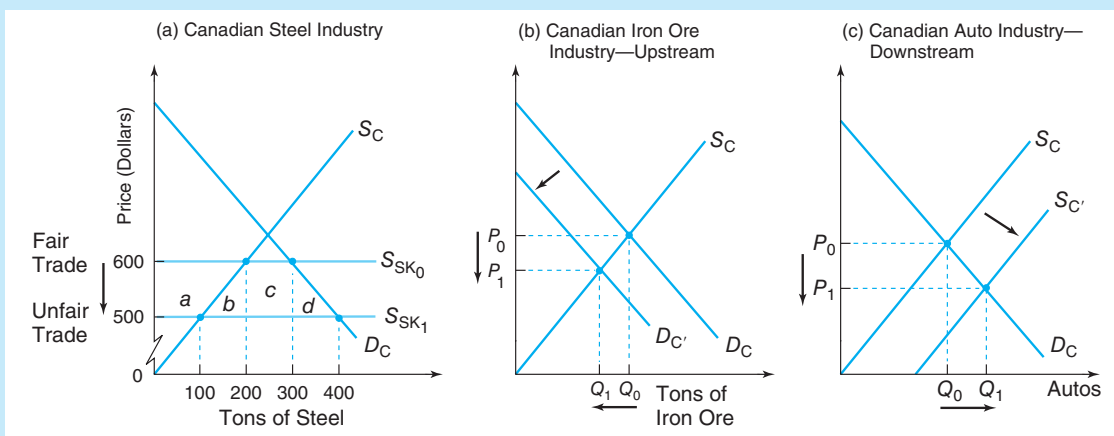
⁷U.S. International Trade Commission, *The Economic Effects of Antidumping and Countervailing Duty Orders and Suspension Agreements*, Washington, DC: International Trade Commission, June 1995.

industry). Dumping at prices below fair market value and subsidizing exports are considered unfair trade practices under international trade law; they can be neutralized by the imposition of antidumping or countervailing duties on dumped or subsidized imports.

Figure 6.3 illustrates the effects of unfair trade practices on Canada, a nation too small to influence the foreign price of steel; for simplicity, the figure assumes that Canada’s steel, iron ore, and auto companies operate in competitive markets. In Figure 6.3(a), S_C and D_C represent the Canadian supply and demand for steel. Suppose that South Korea, which has a comparative advantage in steel, supplies steel to Canada at the fair trade price of \$600 per ton. At this price, Canadian production equals 200 tons, consumption equals 300 tons, and imports equal 100 tons.

FIGURE 6.3

Effects of Dumped and Subsidized Imports and Their Remedies



Dumped or subsidized imports provide benefits to consumers if imports are finished goods and to consuming producers that use the imports as intermediate inputs into their own production; they inflict costs on the import-competing domestic producers, their workers, and other domestic producers selling intermediate inputs to the import-competing producers. An antidumping or countervailing duty inflicts costs on consumers if imports are finished goods and on consuming producers that use the imports as intermediate inputs into their own production; benefits are provided to import-competing domestic producers, their workers, and other domestic producers selling intermediate inputs to the protected industry.

Now suppose that as a result of South Korean dumping and subsidizing practices, Canada imports steel at \$500 per ton; the margin of dumping and subsidization would equal \$100 ($\$600 - \$500 = \100). The unfair trade practice reduces Canadian production from 200 tons to 100 tons, increases Canadian consumption from 300 tons to 400 tons, and increases Canadian imports from 100 tons to 300 tons. Falling prices and quantities, in turn, lead to falling investment and employment in the Canadian steel industry. Although the producer surplus of Canadian steelmakers decreases by area a due to unfair trade, Canadian buyers find their consumer surplus rising by area $a + b + c + d$. The Canadian steel market as a whole benefits from unfair trade because the gains to its consumers exceed the losses to its producers by area $b + c + d$!

Unfair trade also affects Canada’s upstream and downstream industries. If the Canadian iron ore industry (upstream) supplies mainly to Canadian steelmakers, the demand for

Canadian iron ore will decrease as their customers' output falls based on competition from cheaper imported steel. As illustrated in Figure 6.3(b), without unfair trade, the quantity of iron ore demanded by Canadian steelmakers is Q_0 tons at a price of P_0 per ton. Because of unfair trade in the steel industry, the demand for iron ore decreases from D_C to $D_{C'}$; production falls, as do revenues and employment in this industry. In autos (downstream), production will increase as manufacturing costs decrease because of the availability of cheaper imported steel. As illustrated in Figure 6.3(c), Canadian auto production increases from Q_0 units to Q_1 units as the supply curve shifts downward from S_C to $S_{C'}$ with accompanying positive effects on revenues and employment; the decrease in production costs also improves the Canadian auto industry's competitiveness in international markets.

Suppose that unfair trade in steel results in the imposition by the Canadian government of an antidumping duty or countervailing duty on imported steel equal to the margin of dumping or subsidization (\$100). The effect of an exact offsetting duty in the steel industry is a regaining of the initial prices and quantities in Canada's steel, iron ore, and auto industries, as seen in Figure 6.3. The duty raises the import price of unfairly traded steel in Canada, leading to increased steel production by Canadian steelmakers; this results in increased demand and higher prices for Canadian iron ore, but also implies increased production costs, higher prices, and lower sales for Canadian automakers. With the import duty, the decrease in the consumer surplus more than offsets the increase in the producer surplus in the Canadian steel market.⁸

U.S. Steel Companies Lose an Unfair Trade Case and Still Win

For years, the U.S. steel industry has dominated at the complaint department of the U.S. International Trade Commission. The steel industry has swamped the USITC with numerous petitions alleging that foreign steel has been subsidized or dumped into the U.S. market. However, the steel industry has not always been successful in its petitions against cheap imports; it has lost more cases than it has won.

To the steel industry, winning isn't everything. Just filing and arguing its cases is part of its competitive strategy. Steel companies know that they can use the trade laws to influence the supply of steel in the marketplace and thus limit foreign competition. Whenever the market gets weak, for whatever reason, they can file an unfair trade case.

Here's how the strategy works. The market gets soft, and the steel companies file trade cases alleging foreign subsidization or dumping, and then imports from the target companies decrease. The case proceeds for a year or so, allowing domestic steelmakers to increase market share and raise prices. Even if the USITC rules against the case, the market has time to recover.

Once a case is filed, it takes months to proceed through a four-stage legal process, and time benefits domestic steelmakers. American steelmakers usually win the first round, in which the industry has to show the USITC a "reasonable indication" of harm from imports. Armed with that finding, the U.S. Department of Commerce can set preliminary duties on the imports. Importers must post a financial bond to cover those duties. Then, the Commerce Department determines the final duties, based on the extent of foreign subsidization or dumping, and the case goes back to the USITC for a final determination of injury. If the U.S. companies lose, the duty is never collected, and the bond is lifted. However, if they win, the importer may be liable for the full amount.

During this process, U.S. importers have the right to continue importing. They might continue to import if they feel strongly that the U.S. steelmakers will lose the case. However,

⁸U.S. International Trade Commission, *The Economic Effects of Antidumping and Countervailing Duty Orders and Suspension Agreements*, Washington, DC: International Trade Commission, June 1995.

the USITC is a political body, with some of the presidentially appointed commissioners being free traders and others tending to be more protectionist. Because U.S. importers realize that they run a big risk if they are wrong, the response is usually to stop importing when a case is filed.

Just by filing unfair trade cases, the U.S. steel industry may win. Whatever it spends on legal fees, it may recoup many times over in extra revenue. That's the great thing about filing: Even if you lose, you still win.

Section 301: Protection against Unfair Trading Practices

Section 301 of the Trade Act of 1974 gives the U.S. trade representative (USTR) the authority, subject to the approval of the president, and the means to respond to unfair trading practices by foreign nations. Included among these unfair practices are foreign trade restrictions that hinder U.S. exports and foreign subsidies that hinder U.S. exports to third-country markets. The USTR responds when they determine that such practices result in “unreasonable” or “discriminatory” burdens on U.S. exporters. The legislation was primarily a congressional response to dissatisfaction with GATT’s ineffectiveness in resolving trade disputes.

Section 301 investigations are usually initiated on the basis of petitions by adversely affected U.S. companies and labor unions; they can also be initiated by the president. If after investigation it is determined that a foreign nation is engaging in unfair trading practices, the USTR is empowered to (1) impose tariffs or other import restrictions on products and services and (2) deny the foreign country the benefits of trade agreement concessions.

Although the ultimate sanction available to the United States is retaliatory import restrictions, the purpose of Section 301 is to obtain the successful resolution of conflicts. In a large majority of cases, Section 301 has been used to convince foreign nations to modify or eliminate what the United States has considered to be unfair trading practices; only in a small minority of cases has the United States retaliated against foreign producers by means of tariffs or quotas. Foreign nations have often likened Section 301 to a “crowbar” approach to resolve trade disputes that invites retaliatory trade restrictions. At least two reasons have been advanced for the limitations of this approach to opening foreign markets to U.S. exports: (1) Nationalism unites the people of a foreign nation against U.S. threats of trade restrictions; and (2) the foreign nation reorients its economy toward trading partners other than the United States.

An example of a Section 301 case is the banana dispute between the United States and Europe. In 1993, the EU implemented a single EU-wide regime on banana imports. The regime gave preferential entry to bananas from the EU’s former colonies, including parts of the Caribbean, Africa, and Asia. It also restricted entry from other countries, including several in Latin America where U.S. companies predominate. According to the United States, the EU’s banana regime resulted in unfair treatment for American companies. U.S. trade officials maintained that Chiquita Brands International and Dole Food Co., which handle and distribute bananas from Latin American nations, lost half of their business because of the EU’s banana regime. As a result, the United States and several Latin American countries brought this issue to the WTO and successfully argued their case. The WTO ruled that the EU’s banana regime discriminated against U.S. and Latin American distribution companies and banana exports from Latin American countries. After a prolonged struggle, Europe modified its behavior and the tariff was lifted.

Protection of Intellectual Property Rights

In the 1800s, Charles Dickens criticized U.S. publishers for printing unauthorized versions of his works without paying him one penny. U.S. copyright protection did not apply to foreign (British) authors, so Dickens's popular fiction could be pirated without punishment. In recent years, it is U.S. companies whose profit expectations have been frustrated. Publishers in South Korea run off copies of bootlegged U.S. textbooks without providing royalty payments. American research laboratories find themselves in legal tangles with Japanese electronics manufacturers concerning patent infringement.

Intellectual property is an invention, idea, product, or process that has been registered with the government and awards the inventor (or author) exclusive rights to use the invention for a given time period. Governments use several techniques to protect intellectual property. *Copyrights* are awarded to protect works of original authorship (music compositions and textbooks); most nations issue copyright protection for the remainder of the author's life plus 50 years. *Trademarks* are awarded to manufacturers and provide exclusive rights to a distinguishing name or symbol (Coca-Cola). *Patents* secure to an inventor for a term, usually 20 years, the exclusive right to make, use, or sell the invention.

Although measuring the flow of ideas is difficult, patents provide some evidence on the production of ideas. What we learn from this data is that global idea production has traditionally been dominated by the United States, Japan, and China, as shown in Table 6.6.

Despite efforts to protect **intellectual property rights (IPRs)**, competing firms sometimes infringe on the rights of others by making a cheaper imitation of the original product. The lack of effective international procedures for protecting IPRs becomes a problem when the expense of copying an innovation (including the cost of penalties if caught) is less than the cost of purchasing or leasing the technology. Suppose that Warner-Lambert Drug Co. develops a product that cures the common cold, called "Cold-Free," and the firm plans to export it to Taiwan. If Cold-Free is not protected by a patent in Taiwan, either because Taiwan does not recognize IPRs or Warner-Lambert has not filed for protection, cheaper copies of Cold-Free could legally be developed and marketed. If Warner-Lambert's trademark is not protected, counterfeit cold remedies that are indistinguishable from Cold-Free could be legally sold in Taiwan. These copies would result in reduced sales and profits for Warner-Lambert. If "Cold-Free" is a trademark that consumers strongly associate with

TABLE 6.6

Patents in Force by Selected Countries in 2014

Country	Number of Patents
United States	2,527,750
Japan	1,920,490
China	1,196,407
South Korea	892,597
Germany	576,273
France	510,490
United Kingdom	498,904
Switzerland	144,859

Source: From World Intellectual Property Organization, *Patents in Force: Total Count*, Statistics Data Center, March 2016. See also World Intellectual Property Organization, *World Intellectual Property Indicators*, 2016.

Warner-Lambert, a counterfeit product of noticeably inferior quality could adversely affect Warner-Lambert's reputation and detract from the sales of both Cold-Free and other Warner-Lambert products.

Although most nations have regulations protecting IPRs, many problems have been associated with trade in products affected by IPRs. One problem is differing IPR regulations across nations. The United States uses a first-to-invent rule when determining patent eligibility, whereas most other nations employ a first-to-file rule. Another problem is lack of enforcement of international IPR agreements. These problems stem largely from differing incentives to protect intellectual property, especially between nations that are innovating, technological exporters and those that are aren't technological importers. Developing nations lacking in research and development and patent innovation sometimes pirate foreign technology and use it to produce goods at costs lower than could be achieved in the innovating nation. Poorer developing nations often find it difficult to pay the higher prices that would prevail if innovated products (such as medical supplies) were provided patent protection. They have little incentive to provide patent protection to the products they need.

As long as the cost of pirating technology, including the probability and costs of being caught, is less than the profits captured by the firm doing the pirating, technology pirating tends to continue. However, pirating reduces the rate of profitability earned by firms in the innovating nations, which in turn deters them from investing in research and development. Over time, this lack of investment leads to fewer products and welfare losses for the people of both nations.

The United States has faced many obstacles in trying to protect its intellectual property. Dozens of nations lack adequate legal structures to protect the patents of foreign firms. Others have consciously excluded certain products (such as chemicals) from protection to support their industries. Even in developed countries where legal safeguards exist, the fast pace of technological innovation often outruns the protection provided by the legal system.

China's Piracy of Software

When China became a member of the World Trade Organization in 2001, it agreed to implement the WTO's standards on IPR protection and rules for enforcement. However, critics have maintained that China has fallen short of the mark for several reasons:

- China's transformation from a command economy, in which the government owned and controlled most aspects of economic life, to one that has become more market based is a relatively recent occurrence in China's history. Therefore, IPR enforcement is unfamiliar for many people in China and thus the government has difficulty in convincing its citizens that IPR piracy is illegal.
- Chinese government officials want to make China a major producer of high-technology and capital-intensive goods, and therefore they are tolerant of IPR piracy.
- Although China's central government may be committed to protecting IPR, local government officials tend to be less supportive because production of pirated goods results in jobs and tax revenues.
- IPR enforcement will likely be inadequate until Chinese-owned businesses begin to place pressure on the government to protect their own brands and IPR-related goods.

Although China has improved its IPR protection regime in recent years, American industries complain that piracy rates in China remain unacceptably high and economic losses are sizable. Table 6.7 provides examples of IPR violations in China.

Consider the case of Microsoft Corp., the maker of computer software. Microsoft is among the firms whose sales have suffered because of Chinese piracy. In China, illegal copies of Microsoft's Office and Windows programs have been sold on street corners

TABLE 6.7

Examples of Intellectual Property Right Violations in China

Affected Firm	Violation in China
Epson	Copying machines and ink cartridges are counterfeited.
Microsoft	Counterfeiting of Windows and Windows NT, with packaging virtually indistinguishable from the real product and sold in authorized outlets.
Yamaha	5 of every 6 JYM150-A motorcycles and ZY125 scooters bearing Yamaha's name are fake in China. Some state-owned factories manufacture copies four months following the introduction of a new model.
Gillette	Up to one-fourth of its Parker pens, Duracell batteries, and Gillette razors sold in China are pirated.
Anheuser-Busch	Some 640 million bottles of fake Budweiser beer are sold annually in China.
Bestfoods	Bogus versions of Knorr bouillon and Skippy Peanut Butter lead to tens of millions of dollars in forgone sales each year.

Source: From U.S. Trade Representative, *National Trade Estimate Report on Foreign Trade Barriers*, various issues, available at <http://www.ustr.gov>.

for \$2 to \$3 each, a fraction of their retail price, despite attempts by the company to discourage illegal counterfeiting. Microsoft has rejected the argument widespread in China that many Chinese consumers use pirated software because authentic versions are too expensive. Although Microsoft recognizes that not everyone in China can afford a PC, the firm maintains that if you can afford a PC, you can afford the software that accompanies it. Despite having frustrations about piracy, Microsoft has continued to invest in China.

Trade Adjustment Assistance

Economists tend to agree that in defining the rules of trade among countries, freer trade is preferable to protectionism. Insights from trade theory point to the mutual gains for countries trading according to the principle of comparative advantage: They produce those goods at which they are relatively more efficient, and trade for those at which they are relatively less so. Consumers gain by having a wider variety of goods to choose from at lower prices.

However, increased competition from trade liberalization creates both “winners and losers,” resulting in adjustment problems for all countries. The more efficient firms and plants may grow as they expand into overseas markets; the less efficient may contract, merge, or perhaps even fail when encountering increased foreign competition. While the adjustment process may be healthy from a macroeconomic perspective, much like market-driven adjustments that occur for reasons other than trade (for example, technological change), it can be a harsh transition for some firms and their workers.

Critics of free trade agreements often cite the adjustment costs of import competition. To avoid business closures and layoffs, trade-impacted firms may seek to weaken, if not defeat, trade liberalizing legislation. This makes economic sense from the perspective of affected industries, firms, and workers. However, economists argue that in the long run protectionism can be more costly for the country as a whole. The costs of protection arise because competition is decreased, reducing pressure on firms to innovate, operate more efficiently, and become lower-cost producers. The brunt of these costs falls on consumers, both individuals and businesses, who must pay higher prices. The national economy is also denied higher standards of living because of forgone productivity gains.

While the benefits of freer trade are spread throughout the economy, acute losses can be concentrated in specific geographic regions and among a relatively small number of workers who lose their jobs or otherwise find their earning power permanently damaged because of

import competition. For example, in the late 1980s, large layoffs in the steel and auto industries occurred in the “rust-belt” states—Michigan, Ohio, Pennsylvania, and Virginia. Evidence suggests that American workers who are displaced by import competition tend to be older and less educated than the overall labor force, and they often find it difficult to become reemployed in other industries without additional educational or training programs which can often take two or more years to complete. Therefore, compared with other displaced workers, trade-displaced workers tend to face higher adjustment costs as they must endure longer unemployment spells and larger wage losses once reemployed.

One way to balance the gains of freer trade that are realized broadly throughout the economy with the costs that tend to be more concentrated is to address the needs of firms and workers that have been adversely affected. Many advanced nations have done this by enacting programs for granting **trade adjustment assistance** (TAA) to those who incur hardships because of trade liberalization. The underlying rationale comes from the notion that if society in general enjoys welfare gains from the increased efficiency stemming from trade liberalization, some sort of compensation should be provided for those who are injured by import competition. As long as freer trade generates significant gains to the nation, the winners can compensate the losers and still enjoy some of the gains from freer trade.

Supporters justify trade adjustment assistance on grounds that (1) it helps those who are harmed by trade liberalization (the losers); (2) the economic costs are lower than protectionism and can be borne by society as a whole (the winners); and (3) given rigidities in the adjustment process, it may help redeploy economic resources more quickly, thereby reducing productivity losses and related public sector costs such as unemployment compensation. Therefore, trade adjustment assistance is seen as an alternative to protectionist policies that would restrict imports; that is, the program provides assistance while bolstering freer trade and diminishing prospects for retaliation among trade partners.

Trade Adjustment Assistance for Workers, Firms, Farmers, and Fishermen

Since 1962, the U.S. government has responded to trade adjustment costs by authorizing trade adjustment assistance for firms, farmers, fishermen, and workers. Eligible firms, farmers, and fishermen can receive technical assistance and cash payments from the federal government to help improve their productivity and competitive position in the global economy.

The essence of the U.S. trade adjustment assistance program for workers can be seen in the following example. In 2015, Brandon lost his job as a maintenance mechanic in a company that he worked with for 13 years before it moved its plant overseas. Prior to becoming an adversely affected worker, Brandon held an associate’s degree in Mechanics and a certificate in Welding from Southeast Community College. Under the TAA Program, Brandon decided to enroll in the Nursing program at North Central Missouri College. In 2017, Brandon successfully completed his training and received a Certificate in Nursing. He is now using his newly acquired skills and is working at a hospital in Fairfax, Missouri as a Licensed Practical Nurse.

Trade adjustment assistance for workers provides federal assistance to those who have involuntarily lost their jobs due to foreign competition or offshoring. To be eligible for trade adjustment assistance, a group of workers must establish that they were separated from their employment either because their jobs moved outside the United States or because of an increase in directly competitive imports. Workers at firms that are suppliers to TAA-certified firms may also be eligible for TAA benefits. To qualify these benefits, trade-affected workers must petition the U.S. Department of Labor (DOL) and a DOL investigation must verify the role of foreign trade in the workers’ job losses.

Individual benefits are funded by the U.S. government and administered by the states through their workforce systems and unemployment insurance systems. Benefits available to individual workers include the following:

- Assistance in preparing for and obtaining new employment, such as support for workers in developing skills for a new occupation.
- Weekly income support payment for workers who have exhausted their unemployment insurance and who are enrolled in an eligible training program.
- Reimbursement for relocation costs for a job outside the worker's local commuting area.
- Wage insurance available to workers age 50 and over and who obtain reemployment at a lower wage. The wage insurance program provides a cash payment equal to 50 percent of the difference between the worker's new wage and previous wage, up to a two-year maximum of \$10,000.

In this manner, the trade adjustment assistance program is designed to address the unique needs of trade-displaced workers. The program extends benefits to its participants in order to give them adequate time to acquire the skills necessary to become reemployed in a new industry or occupation.

Simply put, the notion of trade adjustment assistance was in theory a substantial advance over the economists' concept of compensation. Compensating the unemployed for not working, through unemployment compensation programs or disability programs, might be a fair and reasonable method of redistributing the gains from trade. However, it would not produce lasting benefits for the economy. Instead, retraining workers in ways that provide them with new skills and efficiencies and moving them as quickly as possible back into the workforce would foster the economy's competitiveness.

In 1962, President John F. Kennedy declared that those injured by trade competition should not be required to bear the full brunt of the impact; rather the burden of economic adjustment should be borne in part by the federal government. This led to Congress' passing the Trade Expansion Act of 1962 which granted the president unprecedented authority to negotiate tariff reductions as well as establish trade adjustment assistance. A key motivation behind trade adjustment assistance was based on political considerations. The program was part of a package to win labor union support for tariff reductions authorized by the Trade Expansion Act.

Is Trade Adjustment Assistance Necessary?

Despite the appeal of trade adjustment assistance, the effectiveness of this program has been the subject of widespread debate. One concern expressed is whether a special program for trade-related job losses should exist. Are job displacements caused by foreign competition any different from job displacements caused by any other form of competition? Also, critics note that job training programs sponsored by TAA are often ineffective; even if the training programs are effective, workers may be reluctant to move to new areas, mainly because of family commitments or ties to the community.

When Ronald Reagan became president in 1981, he promised to reduce government spending. Trade Adjustment Assistance was one of the first programs affected. Payments to workers and firms were decreased, eligibility time was reduced, and the criteria stiffened. Although the budget for Trade Adjustment Assistance has had its ups and downs since the 1980s, the program has never assisted more than a fraction of the workers potentially eligible for government aid. Critics note that every other major economy currently spends at least twice what the United States does in retraining workers and helping them find new jobs. For example, Denmark spends more than 2 percent of its gross domestic product

helping unemployed workers back into the labor force, about 20 times as much as the United States. Germany and France spend about five times as much.

At the writing of this text, many analysts noted that, if additional efforts to promote freer trade are to be successful, they will require a rethinking about how to take care of those who have been harmed by the opening of markets. Should trade adjustment include more generous jobless benefits or a more comprehensive system of wage insurance? That might inspire workers to acquire new skills by taking a less well-paid job when they lose a good one. However, there is little point in helping people change careers if a lack of dynamism in the economy means that too few good jobs are being created. How to grow the economy will continue to be of vital concern for the nation.

However, not all observers are enthusiastic about trade adjustment assistance. They note that besides losing jobs due to import competition and outsourcing, many workers lose their jobs because of cyclical fluctuations in the economy, changing technology, bad management of firms, and other factors. Therefore, some critics ponder over what makes losing one's job to international trade worthy of the special treatment provided by trade adjustment assistance compared to losing one's job because of cyclical downturns in the economy or technological change. There does not appear to be a totally satisfactory answer to this question.⁹

INTERNATIONAL TRADE APPLICATION

United States Lifts Its Restrictions on Oil Exports

After decades of falling domestic oil production, by 2014–2015 output was surging in the United States. The reason? Technological changes in producing crude oil and natural gas from shale (hydraulic fracturing and horizontal drilling) turned America into a big fuel producer. With the production of America's crude oil and natural gas surging, a national debate emerged: Should the United States repeal its 1970s era ban on exports of these energies?

The ban eliminated most avenues for U.S. oil exports; less than 2 percent of the oil produced in the United States is sold outside its borders. The ban was adopted as part of a series of laws passed after the 1973 Arab oil embargo and the Iranian Revolution in 1978–1979. At that time, the United States was concerned about shortages of oil and possible supply disruptions as a threat to its security. The export ban was meant to increase America's oil independence and ensure that foreign powers could not bring the United States to its knees by denying access to energy. It was also intended to prevent



American producers from skirting government price ceilings by selling crude oil into the world market at higher prices. By 2015, however, economic conditions had dramatically changed. Many analysts felt that the ban on oil exports no longer reflected the dramatic turnaround in U.S. oil production. Thus, calls have been made to have the export ban lifted.

The mismatch between increasing U.S. oil production from shale and the country's ability to refine it is what has driven the debate over whether to eliminate the ban on crude exports. Producing oil from shale yields very light oil (a lower density and lower sulfur variety) that is not well connected to the infrastructure of American refineries that process it; they are geared to process heavy crude oil coming from Canada, Mexico, and Venezuela. Should the abundant, light crude oil be exported?

Supporters of exports maintain that allowing American oil to flow onto the global market will provide incentives to produce more oil, because the fuel would command higher prices than it would in the United States. It will

(continued)

⁹Edward Alden, *Failure to Adjust: How Americans Got Left Behind in the Global Economy*, Rowman and Littlefield, Lanham, Maryland, 2016.

also reduce America's trade deficit and pump more money into the U.S. economy. Moreover, allowing U.S. producers new export markets for their oil could, over time, drive down the price of gas for Americans. Why? Adding U.S. crude oil to the world market would increase supply and thus reduce global oil prices. Because America's gasoline is priced off global gasoline prices, rather than domestic crude prices, the decrease will flow back into reduced prices at the pump.

However, opponents of exports contend that isn't the case. Removing the export restriction, they say, will drive up prices of oil and gas for American industries that depend on them. This will discourage innovation among energy firms and harm the environment. Also, the recent oil boom has resulted in surplus quantities of crude oil, which help insulate the U.S. economy from the uncertainty caused by oil supply disruptions abroad. The allowing of crude exports would eliminate that protection. Finally, some American refiners oppose lifting the export ban, saying that they can make the

investments needed to change configurations to allow for greater processing of light crudes. However, it would likely take considerable time and much investment to make this conversion.

In December 2015, nearly 40 years to the day after the oil export ban was enacted by then-president Gerald Ford, President Barack Obama signed into law legislation lifting the prohibition. This was a victory for the U.S. oil industry, which lobbied for over two years to end the ban.

What do you think? Oil is a vital resource for the United States. Do you feel that American oil companies should be allowed to export oil to foreign markets?

Sources: Jason Bordoff and Trevor Houser, *Navigating the U.S. Oil Export Debate*, Columbia/SIPA Center on Global Energy Policy, Columbia University, January 2015; Christian Berthelsen, Lynn Cook, and Laurence Iliff, "U.S. Loosens Longtime Ban on Oil Exports," *The Wall Street Journal*, August 15, 2015; Christina Nunez, "Amid U.S. Oil Bounty, a Growing Debate over Exports," *National Geographic News*, June 16, 2014; IHS Global Inc., *U.S. Crude Export Decision*, Englewood, CO 2014.

Industrial Policies of the United States

Besides enacting regulations intended to produce a fair trading environment for all parties engaging in international business, the United States has implemented *industrial policies* to enhance the competitiveness of domestic producers. As discussed in Chapter 3, such policies involve government channeling of resources into specific, targeted industries that it views as important for future economic growth. Among the methods used to channel resources are tax incentives, loan guarantees, and low-interest loans.

What has been the U.S. approach to industrial policy? The U.S. government has attempted to provide a favorable climate for business given the social, environmental, and safety constraints imposed by modern society. Rather than formulating a coordinated industrial policy to affect particular industries, the U.S. government has generally emphasized macroeconomic policies (fiscal and monetary policies) aimed at such objectives as economic stability, growth, and the broad allocation of the gross domestic product.

However, there is no doubt that the U.S. government uses a number of measures to shape the structure of the economy that would be called "industrial policies" in other nations. The most notable of these measures is agricultural policy. In agriculture, a farmer who initiates a major innovation can be imitated by many other farmers who capture the benefits without sharing the risks. To rectify this problem, the U.S. government is involved in research in agricultural techniques and in the dissemination of this information to farmers through its agricultural extension service, as well as the fostering of large-scale projects such as irrigation facilities. The U.S. government has also provided support for the shipping, aerospace, shipbuilding, energy, and defense industries, primarily on the grounds of national security.

Another element of U.S. industrial policy is export promotion. The U.S. government furnishes exporters with marketing information and technical assistance, in addition to

trade missions that help expose new exporters to foreign customers. The government also promotes exports by sponsoring exhibits of U.S. goods at international trade fairs and establishing overseas trade centers that enable U.S. businesses to exhibit and sell machinery and equipment. The United States also encourages exports by allowing its manufacturers to form export trade associations to facilitate the marketing of U.S. products abroad.

The Export-Import Bank

The United States provides export subsidies to its producers to promote international sales, thus providing jobs for Americans. The **Export-Import Bank** (Eximbank) is the official export credit agency of the U.S. government. Founded in 1934, its purpose is to provide cheap credit for foreign customers who purchase American-made products. Such credit is provided through a variety of loan, loan guarantee, and insurance programs. Of these programs, loan guarantees are the dominant type of Eximbank financing. Although this assistance is available to any American firm regardless of size, Eximbank supports exports on a small scale. Only about 2 percent of U.S. exports receive Eximbank financing, suggesting that most exports compete without the bank's assistance.

The Eximbank does not compete with private sector lenders, but rather provides financing for transactions that would otherwise not occur because commercial lenders are either unable or unwilling to accept the risks inherent in the deal. Table 6.8 provides examples of direct loans and loan guarantees made by Eximbank. Major beneficiaries have included aircraft, telecommunications, power-generating equipment, and energy developments. Firms such as Boeing, General Electric, Caterpillar, and Westinghouse have enjoyed substantial benefits from these programs as well as many small- and medium-size firms. Because of the fees and interest it charges borrowers, the Eximbank is self-sustaining.

Proponents of the Eximbank contend that American companies that use its financing can compete in a global marketplace in which foreign companies and their governments systematically use export credit financing. A Chinese locomotive company can offer government export financing to international buyers that makes their trains less expensive in foreign markets such as India. When an American company such as General Electric is competing for that locomotive sale, it ought to be able to provide comparable financing for its locomotives. Such policies ensure a level playing field for American companies in a competitive global marketplace.

TABLE 6.8

Examples of Loans Provided by Eximbank of the United States

Foreign Borrower/U.S. Exporter	Purpose
Banco Santander Noroeste of Brazil/General Electric	Locomotives
Government of Bulgaria/Westinghouse	Instruments
Air China/Boeing	Aircraft
Government of Croatia/Bechtel International	Highway construction
Government of Ghana/Wanan International	Electrical equipment
Government of Indonesia/IBM	Computer hardware
Japan Airlines/Boeing	Aircraft
Fevisa Industrial of Mexico/Pennsylvania Crusher Inc.	Glass manufacturing equipment
Delta Communications of Mexico/Motorola	Communications equipment

Source: From Export-Import Bank of the United States, *Annual Report*, various issues, <http://www.exim.gov>.

In offering cheap credit in financing exports, the Eximbank has been criticized because some of its funds are borrowed from the U.S. Treasury. Critics question whether U.S. tax revenues should subsidize exports to foreign countries at interest rates lower than could be obtained from private banks. To this extent, it is true that tax funds distort trade and redistribute income toward exporters, as discussed below.

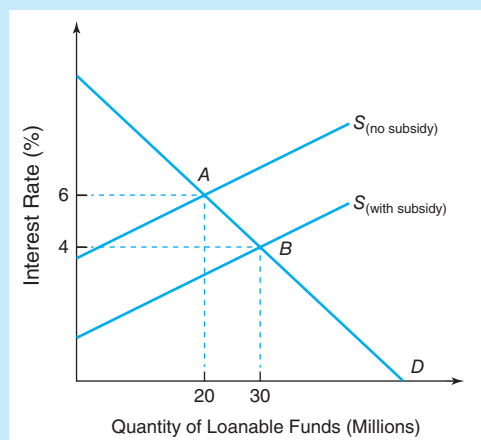
Let us consider the effects of a loan guarantee that the Eximbank offers to a private American lender, say, Bank of America, who makes loans to Japan Airlines Co. (JAL) for the purchase of Boeing aircraft. JAL must pay the Eximbank a fee for the loan guarantee. In exchange, the Eximbank guarantees up to 85 percent of the loan that Bank of America makes to JAL. If the airline cannot pay back the loan, the Eximbank covers the cost. Therefore, JAL gets the loan on better terms than it could in the private market.

Figure 6.4 illustrates the effects of this loan guarantee. In the figure, the quantity of loanable funds is denoted on the horizontal axis, and the price of a loan (the interest rate) is depicted on the vertical axis. The demand curve (D) for loanable funds is under-laid by JAL's demand for investment capital; the curve's downward slope implies that borrowing increases as the interest rate decreases. The supply of loanable funds offered by Bank of America is denoted by S ; its upward slope reflects the law of supply, which means that a bank offers more funds to borrowers when the price (interest rate) increases. In the absence of a loan guarantee, market equilibrium occurs at point A , where \$20 million dollars are lent at a 6 percent interest rate.

We will now consider what happens when the Eximbank guarantees the loans of Bank of America. Realizing that American taxpayers will cover up to 85 percent of its losses, Bank of America will be willing to supply any given quantity of loans at a lower interest rate. Therefore, the supply curve of loanable funds shifts to the lower schedule, $S_{(\text{with subsidy})}$. Given JAL's demand curve for loanable funds (D), the equilibrium interest rate falls to 4 percent.

FIGURE 6.4

Economic Effects of a Loan Guarantee



With a loan guarantee, Japan Airlines Co. (JAL) gets a loan on better terms than it could in the private market. However, American taxpayers bear the risk that the loan will not be repaid. Also, the U.S. economy is made poorer because scarce resources are redirected from higher-valued uses toward lower-valued uses.

JAL thus gets the loan on better terms than it could in the private market. However, although the loan guarantee insulates Bank of America from the true cost of these funds, this does not imply that there is no cost. In this situation, American taxpayers bear the risk. Therefore, the U.S. economy is made poorer because scarce resources are redirected from higher-valued uses toward lower-valued uses. In other words, because Eximbank subsidizes loans to JAL, it diverts capital from other nonsubsidized borrowers, including small- and medium-size firms who seek credit for business investment.

This example concludes that there are beneficiaries of the Eximbank's export subsidy. First, there are the American manufacturers whose products constitute the bulk of the Eximbank's subsidies and can increase their sales abroad. Benefits are also extended to foreign purchasers who are granted loans and loan guarantees from the Eximbank in exchange for purchasing these goods. Furthermore, the beneficiaries include the private American banks who finance these export transactions and get to shift up to 85 percent of the risk onto American taxpayers.

However, there are costs of the loan guarantee. First, American taxpayers bear risks that private American lenders are unable or unwilling to bear. Also, American consumers must pay higher prices for goods that are made artificially expensive by the Eximbank's subsidies. Moreover, there are other American borrowers who lose out on investment capital because they are not fortunate enough to have the full faith and credit of the U.S. taxpayer standing behind them.

U.S. Airlines and Boeing Spar Over Export-Import Bank Credit

In 2014, major airlines in the United States joined to oppose billions of dollars in subsidies for jetliners bought by their foreign rivals from Boeing Co. What they opposed was the export-financing practices of the Eximbank that provide cheap credit to foreign countries and companies that purchase American-made products. Such credit is extended to foreign customers at below-market interest rates that do not qualify for loans from commercial lenders. In 2014, about one-third of Boeing's sales was supported by credit provided by the Eximbank.

Carriers such as Delta Airlines and Southwest Airlines contended that because they are American companies, they cannot receive these export subsidies, which can greatly increase an airline's access to funding and cut its cost of borrowing, while their foreign rivals can benefit from such subsidies. Delta maintained that its interest rate on jetliner purchases from Boeing was 4.5 percentage points higher than the rate paid by carriers in the United Arab Emirates. These international rivals obtained longer term financing and were able to finance a higher percentage of the purchase price than Delta. Delta maintained that giving foreign rivals access to cheap financing puts it at a cost disadvantage and floods the world airline market with uneconomic capacity.

Export subsidies are large because bankers generally dislike lending directly to airlines other than a handful of those with strong credit ratings. Rather than assuming the risk of default when making loans to airlines, bankers want the loans to be guaranteed by the government. Some bankers who are willing to accept more risk and thus charge higher interest rates on loans have maintained that the practices of the U.S. Eximbank squeeze them out of the market.

The dispute amounted to a conflict over which contributes more to the U.S. economy—airlines or plane manufacturers—and how the government can support them without distorting markets. According to Delta, the U.S. government must realize that export credit does more than help Boeing; it also has negative consequences for the American airline industry. Boeing criticized Delta's position by noting that curtailing export credit would jeopardize U.S. aerospace competitiveness as governments in Canada, Brazil, and Europe have ramped up access to export credit.

For the U.S. economy as a whole, the subsidy conflict revealed a trade-off. Economic gains accrued to Boeing in the form of increased sales, profits, more jobs, and higher earnings for its workers. Increased jetliner exports by Boeing also strengthened the U.S. balance of trade. The cost disadvantage placed on American airlines by the export subsidy led to decreasing sales and profits, losses in jobs and earnings for their workers, and a weakening of the U.S. trade balance as American airlines lost market share to foreign airlines. It remains to be seen how this conflict will be resolved.¹⁰

U.S. Solar Industry Dims as China's Industrial Policy Lights Up

Solar energy has been harnessed by humans since ancient times using a range of ever-evolving technologies. Although there is no denying solar energy's promise and potential, debate remains about how the industry should develop. Should the market be relied on to determine winners and losers, or should industrial policy carry out the task, whereby governments subsidize their producers to enhance their competitiveness?

The bankruptcy of three American solar power companies in 2011 left China's industry with a dominant sales position; about two-thirds of the market. Another major producer of solar energy, Germany, was also retrenching in that year. Although some American, Japanese, and European solar companies had a technological edge over their Chinese rivals, they maintained that they could not beat the Chinese when it came to cost. They noted that the Chinese government has been particularly effective in developing an industrial policy that provides Chinese manufacturers with a number of advantages in the global solar industry, including access to lower-cost capital, subsidized electricity rates, free access to land, and a much shortened permitting process for factories. China's solar energy producers have realized huge economies of scale that result in decreasing production cost and increased competitiveness. China is not alone in using industrial policy to promote clean energy. The European Union and the United States provide governmental support for solar energy, including tax credits for buyers and low interest rate loans and loan guarantees for solar companies.

At the heart of the solar industry's problems in 2011 were sharply decreasing prices for solar panels and their components—wafers, cells, polysilicon, and the modules themselves. The reason was obvious: There were simply too many manufacturers trying to sell their products. The glut of manufacturers was a result of factors including efforts by the U.S. government to promote clean technology, venture capitalists pouring into the sector, investors purchasing stock issues of solar companies during an upswing in oil prices, and an increased sense of urgency for climate change. European governments offered substantial subsidies for solar installation, stimulating demand in the market. The abundant production of solar panels resulted in cutthroat price competition. In 2010, solar panels sold for \$1.60 per watt, on average. By 2011, the going price was between \$0.90 per watt and \$1.05 per watt. Despite the buyers' market, customers were not purchasing solar panels fast enough to match the increase in supply. The result was the bankruptcy of numerous producers.

The bankruptcy of Solyndra Inc. in 2011, a California company making solar panels, received much publicity. In 2010, President Barack Obama visited Solyndra and touted it as a leading company in a growing industry. The company found that it could not compete with cheaper Chinese-manufactured solar panels, so it defaulted on its government-guaranteed loan of \$535 million. This resulted in attacks by critics of Obama who tried to make the failed solar panel company both a symbol of the failure of industrial policy in solar energy and a club with which to beat alternative renewable energy of all kinds.

¹⁰“Carriers Oppose Plane Subsidies,” *The Wall Street Journal*, October 7, 2010, p. B-3; and “U.S., European Airlines to Seek Curbs on Aircraft Subsidies,” *Bloomberg*, October 6, 2010, at <http://www.bloomberg.com/news>.

Carrier Inc. Agrees to Keep Jobs in Indiana

Soon after being elected to President of the United States, Donald Trump was enacting industrial policy. In December, 2016 Trump triumphantly announced that he had convinced Carrier Inc., which produces heating and cooling equipment, to keep about 1,000 jobs at its Indianapolis factory from moving to Mexico. In exchange, Carrier would get a \$7 million tax break over 10 years from Indiana and promises of tax reductions and less regulation from the Trump administration. Trump also threatened to impose import tariffs of 35 percent on American companies that outsource production to other countries and then sell their products in the United States. Carrier is a unit of Hartford, Connecticut-based United Technologies Corporation, which also owns Pratt and Whitney, a big supplier of fighter jet engines that relies in part on U.S. military contracts.

The gas furnaces Carrier manufactures in Indianapolis are a low-tech product in which the United States has no comparative advantage. The comparative advantage in gas furnaces exists in Mexico, largely because of lower wages. Carrier wanted to relocate its production line to Mexico to remain competitive in the market for gas furnaces. Carrier had expected to save about \$65 million a year by shifting the Indianapolis plant's operations to Monterrey, where wages averaged about \$11 a day. That compared to an average wage of about \$30 an hour for the Indiana jobs that would be retained.

Carrier noted that if the extra costs of staying in Indianapolis eroded its gas furnace business, the Indianapolis workers would eventually lose their jobs in any case. That is, any company pressured into keeping a high-cost plant open will have to choose between subpar profits to match the price of cheaper imports, or losing market share.

Besides applying industrial policy to Carrier, Trump aggressively pressured American auto companies to produce their vehicles in the United States, including Ford, General Motors, and Chrysler. He also criticized the price that the Pentagon paid for jets produced by Lockheed Martin Corp. and the prices that Boeing Inc. charged for its jumbo jets.

Critics of Trump's use of industrial policy noted that his pressure tactics would not take away Mexico's comparative advantage in labor-intensive manufacturing. However, his tactics would encourage other American businesses to seek special treatment from the U.S. government at the expense of taxpayers and consumers. Simply put, the United States will not become more prosperous by forcing businesses to make noneconomic investments, according to the critics of Trump.¹¹

Strategic Trade Policy

Beginning in the 1980s, a new argument for industrial policy gained prominence. The theory behind **strategic trade policy** is that government can assist domestic companies in capturing economic profits from foreign competitors.¹² Such assistance entails government support for certain "strategic" industries (such as high technology) that are important to future domestic economic growth and provide widespread benefits (externalities) to society.

¹¹Ted Mann, "Carrier Corp. Agrees to Keep About 1,000 Jobs at Indiana Plant," *The Wall Street Journal*, November 29, 2016; Ted Mann, Damian Paletta, and Andrew Tangel, "Donald Trump Warns of Penalties if U.S. Firms Take Jobs Abroad," *The Wall Street Journal*, December 1, 2016; Julie Pace, "Carrier Says It Has Deal with Trump to Keep Jobs in Indiana," *PBS NewsHour*, November 30, 2016; and Vikas Bajaj, "Donald Trump's Company-by-Company Industrial Policy," *The New York Times*, December 8, 2016.

¹²The argument for strategic trade policy was first presented in J. Brander and B. Spencer, "International R&D Rivalry and Industrial Strategy," *Review of Economic Studies* 50 (1983), pp. 707–722. See also P. Krugman, ed., *Strategic Trade Policy and the New International Economics* (Cambridge, MA: MIT Press, 1986); and P. Krugman, "Is Free Trade Passe?" *Economic Perspectives*, Fall 1987, pp. 131–144.

The essential notion underlying strategic trade policy is *imperfect competition*. Many industries participating in trade, the argument goes, are dominated by a small number of large companies—large enough for each company to significantly influence market price. Such market power gives these companies the potential to attain long-run economic profits. According to the strategic trade policy argument, government policy can alter the terms of competition to favor domestic companies over foreign companies and shift economic profits in imperfectly competitive markets from foreign to domestic companies.

A standard example is the aircraft industry.¹³ With the high fixed costs of introducing a new aircraft and a significant learning curve in production that leads to decreasing unit production costs, this industry can support only a small number of manufacturers. The aircraft industry is also an industry that typically is closely associated with national prestige.

Assume that two competing manufacturers, Boeing (representing the United States) and Airbus (a consortium owned jointly by four European governments), are considering whether to construct a new aircraft. If *either* firm manufactures the aircraft by itself, it will attain *profits* of \$100 million. If *both* firms manufacture the aircraft, they will each suffer a *loss* of \$5 million.

Now assume that the European governments decide to subsidize Airbus production in the amount of \$10 million. Even if both companies manufacture the new aircraft, Airbus is now certain of making a \$5 million profit. The point is this: Boeing will *cancel* its new aircraft project. The European subsidy ensures not only that Airbus will manufacture the new aircraft but also that Boeing will suffer a loss if it joins in. The result is that Airbus achieves a profit of \$110 million and can easily repay its subsidy to the European governments. If we assume that the two manufacturers produce entirely for export, the subsidy of \$10 million results in a transfer of \$100 million in profits from the United States to Europe. Figure 6.5 summarizes these results. The welfare effects of strategic trade policy are discussed in *Exploring Further 6.1*, which can be found in MindTap.

FIGURE 6.5

Effects of a European Subsidy Granted to Airbus

Hypothetical Payoff Matrix: Millions of Dollars

		Without Subsidy		With European Subsidy			
		Airbus		Airbus			
Boeing	Produces	Airbus -5 Boeing -5	Airbus 0 Boeing 100	Boeing	Produces	Airbus 5 Boeing -5	Airbus 0 Boeing 100
	Does Not Produce	Airbus 100 Boeing 0	Airbus 0 Boeing 0		Does Not Produce	Airbus 110 Boeing 0	Airbus 0 Boeing 0

According to the theory of strategic trade policy, government subsidies can assist domestic firms in capturing economic profits from foreign competitors.

Source: Paul Krugman, “Is Free Trade Passe?” *Economic Perspectives*, Fall 1987, pp. 131–144.

¹³Paul Krugman, “Is Free Trade Passe?” *Economic Perspectives*, Fall 1987, pp. 131–144; and R. Baldwin and P. Krugman, “Industrial Policy and International Competition in Wide-Bodied Jet Aircraft,” in R. Baldwin, ed., *Trade Policy Issues and Empirical Analysis* (Chicago: University of Chicago Press, 1988), pp. 45–77.

Consider another example. Suppose the electronics industry has just two companies, one in Japan and one in the United States. In this industry, learning by doing reduces unit production costs indefinitely with the expansion of output. Assume that the Japanese government considers its electronics industry to be “strategic” and imposes trade barriers that close its domestic market to the U.S. competitor; consider that the United States keeps its electronics market open. The Japanese manufacturer can expand its output and reduce its unit cost. Over a period of time, this competitive advantage permits it to drive the U.S. manufacturer out of business. The profits that the U.S. company had extracted from U.S. buyers are transferred to Japan.

Advocates of strategic trade policy recognize that the classical argument for free trade considered externalities at length. The difference, they maintain, is that the classical theory was based on *perfect competition* and does not appreciate the most likely source of the externality, whereas modern theories based on imperfect competition do. The externality in question is the ability of companies to capture the fruits of expensive innovation. Classical theory based on perfect competition neglected this factor because large fixed costs are involved in innovation and research and development, and such costs ensure that the number of competitors in an industry will be small.

The strategic trade policy concept has been criticized on several grounds. From a political perspective, special interest groups may dictate who will receive government support. Also, if a worldwide cycle of activist trade policy retaliation and counter-retaliation were to occur, all nations would be worse off. Governments lack the information to intervene intelligently in the marketplace. In the Boeing–Airbus example, the activist government must know how much profit would be achieved as a result of proceeding with the new aircraft, both with and without foreign competition. Minor miscalculations could result in an intervention that makes the home economy worse off instead of better. Finally, the mere existence of imperfect competition does not guarantee that there is a strategic opportunity to be pursued, even by an omniscient government. There must also be a continuing source of economic profits with no potential competition to erase them. But *continuing* economic profits are probably less common than governments think.

The case of the European subsidization of aircraft during the 1970s provides an example of the benefits and costs encountered when applying the strategic trade policy concept. During the 1970s, Airbus received a government subsidy of \$1.5 billion. The subsidy was intended to help Airbus offset the 20 percent cost disadvantage it faced on the production of its A300 aircraft compared to that of its main competitor, the Boeing 767. Did the subsidy help the European nations involved in the Airbus consortium? Evidence suggests it did not. Airbus itself lost money on its A300 plane and continued to face cost disadvantages relative to Boeing. European airlines and passengers did benefit because the subsidy kept Airbus prices lower; however, the amount of Airbus’s losses roughly matched this gain. Because the costs of the subsidy had to be financed by higher taxes, Europe was probably worse off with the subsidy. The United States also lost, because Boeing’s profits were smaller and not fully offset by lower prices accruing to U.S. aircraft users; but the European subsidy did not drive Boeing out of the market. The only obvious gainers were other nations, whose airlines and passengers enjoyed benefits from lower Airbus prices at no cost to themselves.

Economic Sanctions

Instead of promoting trade, governments may *restrict* trade for domestic and foreign policy objectives. **Economic sanctions** are government-mandated limitations placed on customary trade or financial relations among nations. They have been used to protect the domestic economy, reduce nuclear proliferation, set compensation for property

expropriated by foreign governments, combat international terrorism, preserve national security, and protect human rights. The nation initiating the economic sanctions, the *imposing nation*, hopes to impair the economic capabilities of the *target nation* to such an extent that the target nation will succumb to its objectives.

The imposing nation can levy several types of economic sanctions. *Trade sanctions* involve boycotts on imposing-nation exports. The United States has used its role as a major producer of grain, military hardware, and high-technology goods as a lever to win overseas compliance with its foreign policy objectives. Trade sanctions may also include quotas on imposing-nation imports from the target nation. *Financial sanctions* can entail limitations on official lending or aid. During the late 1970s, the U.S. policy of freezing the financial assets of Iran was seen as a factor in the freeing of the U.S. hostages. Table 6.9 provides examples of economic sanctions levied by the United States for foreign policy objectives.

Figure 6.6 can be used to illustrate the goal of economic sanctions levied against a target country, say, Iran. The figure shows the hypothetical production possibilities curve of Iran for machines and oil. Prior to the imposition of sanctions, suppose that Iran is able to operate at maximum efficiency as shown by point A along production possibilities frontier PPC_0 . Under the sanctions program, a refusal of the imposing nations to purchase Irani oil leads to idle wells, refineries, and workers in Iran. Unused production capacity forces Iran to move inside PPC_0 . If imposing nations also impose export sanctions on productive inputs and curtail equipment sales to Iran, the output potential of Iran would decrease. This is shown by an inward shift of Iran's production possibilities curve to PPC_1 . Economic inefficiencies and reduced production possibilities caused by economic sanctions are intended to inflict hardship on the people and government of Iran. Over time, sanctions may cause a reduced growth rate for Iran. Even if short-run welfare losses from sanctions are not large, they can appear in inefficiencies in the usage of labor and capital, deteriorating domestic expectations, and reductions in savings, investment, and employment. Sanctions do reduce Iran's output potential.

Factors Influencing the Success of Sanctions

The historical record of economic sanctions provides some insight into the factors that govern their effectiveness. Among the most important determinants of the success of economic sanctions are (1) the number of nations imposing sanctions, (2) the degree to

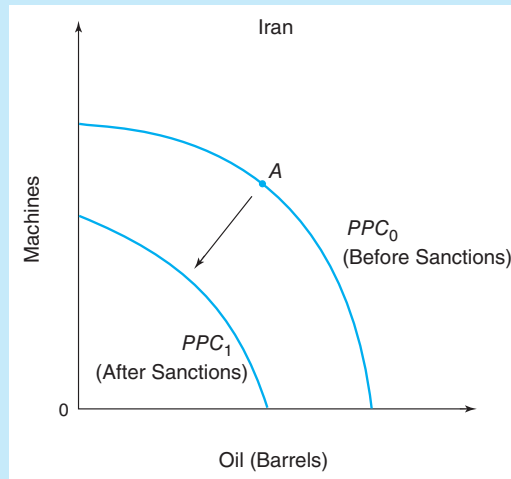
TABLE 6.9

Selected Economic Sanctions of the United States

Year	Target Country	Objectives
2014	Russia	Discourage annexation of Crimea
1998	Pakistan and India	Discourage nuclear proliferation
1993	Haiti	Improve human rights
1992	Serbia	Terminate civil war in Bosnia-Herzegovina
1990	Iraq	Terminate Iraq's military takeover of Kuwait
1987	Iran	Discourage nuclear proliferation
1985	South Africa	Improve human rights
1981	Soviet Union	Terminate martial law in Poland
1979	Iran	Release U.S. hostages; settle expropriation claims
1961	Cuba	Improve national security

FIGURE 6.6

Effects of Economic Sanctions



Economic sanctions placed against a target country have the effect of forcing it to operate inside its production possibilities curve. Economic sanctions can also result in an inward shift in the target nation's production possibilities frontier.

which the target nation has economic and political ties to the imposing nation(s), (3) the extent of political opposition in the target nation, and (4) cultural factors in the target nation.

Although unilateral sanctions may have some success in achieving intended results, it helps if sanctions are imposed by a large number of nations. Multilateral sanctions generally result in greater economic pressure on the target nation than do unilateral measures. Multilateral measures also increase the probability of success by demonstrating that more than one nation disagrees with the target nation's behavior and enhances the political legitimacy of the effort. International ostracism can have a significant psychological impact on the people of a target nation. Failure to generate strong multilateral cooperation can result in sanctions becoming counterproductive; disputes among the imposing nations over sanctions can be interpreted by the target nation as a sign of disarray and weakness.

Sanctions tend to be more effective if the target nation had substantial economic and political relationships with the imposing nation(s) before the sanctions are imposed. Then the potential costs to the target nation are high if it does not comply with the wishes of the imposing nation(s). Western sanctions against South Africa during the 1980s helped convince the government to reform its apartheid system, in part because South Africa conducted four-fifths of its trade with six Western industrial nations and obtained almost all of its capital from the West.

Strength of political opposition within the target nation also affects the success of sanctions. When the target government faces substantial domestic opposition, economic sanctions can lead powerful business interests (such as companies with international ties) to pressure the government to conform to the imposing nation's wishes. Selected, moderate sanctions with the threat of more severe measures to follow inflict economic hardship on domestic residents while providing an incentive for them to lobby for compliance to

forestall more severe sanctions; the political advantage of levying graduated sanctions may outweigh the disadvantage of giving the target nation time to adjust its economy. If harsh, comprehensive sanctions are imposed immediately, domestic business interests have little incentive to pressure the target government to modify its policy; the economic damage has already been done.

When the people of the target nation have strong cultural ties to the imposing nation(s), they are likely to identify with the imposing nation's objectives, which enhances the effectiveness of sanctions. South African whites have generally thought of themselves as part of the Western community. When economic sanctions were imposed on South Africa in the 1980s because of its apartheid practices, many liberal whites felt isolated and morally ostracized by the Western world; this encouraged them to lobby the South African government for political reforms.

Sanctions and Nuclear Weapons: Iran and North Korea

For decades, the United States and the United Nations have imposed economic sanctions against countries that have been implicated in the use of terrorism and the development of chemical, biological, and nuclear weapons. Let us consider the cases of Iran and North Korea.

Iranian Sanctions In response to Iran's continued pursuit of nuclear programs, the United States and other countries levied unprecedented economic sanctions to censure Iran and prevent its further progress in prohibited nuclear activities. The sanctions began in 1979, and they were intensified in 2006 when Iran openly pursued the development of a nuclear reactor. Iran has insisted that its nuclear program is for civilian purposes, including generating electricity, and medical purposes. Yet other countries have been suspicious that this technology can be shifted to the development of nuclear weapons.

Acting both through the United Nations and regional authorities, the United States, along with the European Union, Japan, South Korea, Australia, Norway, Canada, Switzerland, and others have implemented a strong set of trade and financial sanctions related to Iran's nuclear, missile, energy, shipping, transportation, and financial sectors. Among the sanctions that have been used are bans on the export of materials, equipment, and technology that could contribute to Iran's nuclear program, bans on imports of oil from Iran, and the freezing of assets of key Iranian individuals and companies related to the country's nuclear program.

These sanctions have been intended (1) to prevent the transfer of weapons, components, technology, and dual-use items to Iran's prohibited nuclear and missile programs; (2) to target select sectors of Iran's economy relevant to its nuclear proliferation activities; and (3) to encourage Iran to engage constructively, through discussions with the United States, China, Germany, France, Russia, and the United Kingdom, to fulfill its nonproliferation obligations.

The sanctions have significantly burdened Iran's oil-dominated economy. They have contributed to a sharp drop in the value of Iran's currency, an increase in the rate of inflation to over 50 percent, a dramatic decline in Iran's gross domestic product, and an unemployment rate of 20 percent. Iran's oil exports, which fund nearly half of Iran's government spending, have dramatically decreased as a result of the sanctions. Economists estimated that the tightening of U.S. and EU sanctions led to a loss of \$17 billion in export revenue from 2012 to 2014, the equivalent of 4.5 percent of Iran's gross domestic product.

With the pressure of the sanctions mounting, Iran came to realize that it was in an unsustainable situation. In 2015, Iran reached an agreement with negotiators of the United States and its allies, subject to ratification by their governments. Iran agreed to

restrain its enrichment of uranium, the fuel for a bomb, and to cut its stockpile of low- and medium-enriched uranium, from which the weapons-grade stuff is spun, for a period of 10 to 15 years. Iran also agreed to UN inspectors monitoring all its nuclear facilities, including military facilities. Once the agreement was finalized and implemented, most of the sanctions would be lifted.

The lifting of sanctions would provide a major boost to Iran's economy, according to economists at the World Bank.¹⁴ The most significant change would be Iran's return to the world oil market, where it would become an exporting nation. Also, foreign direct investment, which had decreased by billions of dollars following the tightening of sanctions in 2012, would pick up for Iran. Moreover, Iran would have access to frozen financial assets of some \$56 billion. It could use this sum to resurrect its oil fields, revive domestic industries such as auto and pharmaceutical manufacturing, and reduce widespread unemployment. At the writing of this text, it remains to be seen how this provisional agreement will play out.

North Korean Sanctions Since 1950, when North Korea invaded South Korea, the United States and the United Nations have imposed numerous sanctions against North Korea. The use of sanctions has been justified on the grounds that North Korea is a threat to global security through its sponsorship of terrorism and its proliferations of weapons of mass destructions such as nuclear bombs and missiles.

Can North Korea be cajoled or pressured into giving up its nuclear weapons? History does not provide much optimism on this issue. In 1994, President Bill Clinton secured a deal whereby North Korea agreed to stop producing the raw material for nuclear bombs in return for a large injection of aid. North Korea took the money and technical help, but immediately started cheating. Another deal in 2005 failed, for the same reason. The current dictator of North Korea, Kim-Jong Un, apparently sees nuclear weapons as the only way to guarantee the survival of his repressive regime.

The United Nations Security Council has passed numerous rounds of economic sanctions since 2006, when North Korea performed its first nuclear test. Among the sanctions that have been used against North Korea are bans on trade and the entry of North Korean ships and people into other countries. Financial sanctions have also been applied to banks that conduct business with North Korea. For example, once a bank is targeted, it is effectively terminated from the U.S. financial system. The bank cannot clear U.S. dollars and it cannot have transactions with other U.S. banks and financial institutions.

One reason why sanctions have not been able to pressure North Korea into changing its behavior is because North Korea's trade and financial relations with the rest of the world are limited. These limited relations restrict the scope of sanctions and their leverage on North Korea. Another problem is that China, the main economic lifeline of North Korea, who accounts for about 90 percent of its trade, has refrained from implementing substantial sanctions against its neighbor for fear of possible turmoil in the region which could result in masses of North Korean refugees flowing into China as well as U.S. military troops being placed on China's border.

Tensions between North Korea and the United States dramatically increased in 2017 when North Korea test-launched its first ballistic missile potentially capable of hitting America's cities. This resulted in additional UN sanctions being placed against North Korea. These sanctions banned trade in textiles and coal with North Korea (its primary export product) along with other commodities such as natural gas, iron ore, gold, and rare earth

¹⁴Lili Mottaghi, "Economic Implications of Lifting Sanctions on Iran," *MENA Quarterly Economic Brief*, 98389, The World Bank, July 2015.

minerals. Caps were also placed on the amount of oil that North Korea could purchase, thus decreasing oil imports by North Korea by 30 percent. They also barred countries from employing North Korean laborers except when deemed for vital humanitarian reasons. In addition, the United States expanded sanctions to hit any individuals, companies, and financial institutions doing business with North Korea, not only those involved in aiding its weapons program or laundering funds. These measures were intended to slash sources of revenue used to fund North Korea's efforts to develop nuclear weapons. Analysts estimated that the sanctions could cut a third, or \$1 billion, from North Korea's foreign revenue.

However, the sanctions met resistance in Asia, where many countries have business ties with North Korea dating back decades. The biggest challenge was China, which has not fully enforced past UN sanctions, according to analysts. To really pressure North Korea, experts say that China would need to cut off its oil exports to North Korea for a long stretch of time, a move that would be very risky for Beijing. Other countries that appeared unwilling to bear the cost of sanctions included Thailand, Malaysia, and Indonesia. These countries argued that a solution to North Korea's nuclear weapons issue should occur at the bargaining table rather than through the use of economic sanctions to further isolate North Korea from the world community. At the writing of this textbook, there was much uncertainty about the status of North Korea and its nuclear weapons.

Russia Hit by Sanctions Over Ukraine

Responding to political unrest by pro-Russian supporters in Ukraine, in February 2014, President Vladimir Putin sent Russian troops into the country. His military swiftly seized control of the Crimea region in Ukraine. Putin also provided arms and expertise for pro-Russian rebels living in Ukraine. The Ukrainian government responded that Russia's aggression was illegal and must halt. Putin denied supporting the rebels and accused the West of blocking attempts at a political settlement by encouraging Ukraine to use its military to crush the insurgents.

After months of disjointed action, the United States, European Union, and other major nations came together to impose a coordinated package of economic sanctions against Russian individuals, entities, and sectors for Russia's role in the Ukrainian crisis. The sanctions were intended to convince Putin that his aggression against Ukraine would come at a high cost to Russia and that it must be ended.

The sanctions began by imposing bans on travel to the United States, Canada, and the European Union by key Russian officials and politicians. Sanctions were also levied against Russian state-owned banks, which made it harder for these lenders to provide funds for investment throughout Russia. Also, the United States froze the financial assets of wealthy Russian businessmen, with holdings in the United States. Moreover, the sanctions included forbidding the export of technologies needed by Russia's oil and defense industries. Although the sanctions did not target Russia's energy exports, the ban on Western technology was intended to restrict Russia's ability to tap new and hard-to-get-at oil fields in the Arctic and elsewhere, resulting in a possible decrease in oil revenue in the years ahead. However, the sanctions did not completely sever Russia's economic ties to the West. For example, the bans on technology exports to Russia's oil industry left the natural gas sector untouched, due to Europe's dependence on Russian natural gas.

It was generally realized that the West's sanctions were not strong enough to bring Russia to its knees. But they could impose significant harm to an already ailing economy, which suffered from a collapse of its currency, the ruble, in 2014. From January to December, the currency's value fell by about 50 percent in response to falling oil and natural gas prices, capital fleeing Russia for political reasons, and Western sanctions in response to Putin's attacks on the Ukraine.

In response to the West's sanctions, Putin retaliated by banning many food imports from the West, including Europe, Canada, Australia, and the United States. Russia insisted that it could replace Western imports with food from Latin America, Turkey, and former Soviet republics, including Belarus, a major dairy producer. However, most market analysts forecasted shortages and price increases that would further cloud Russia's already bleak economic horizon. Putin also declared that if the West didn't alter its policies, Russia might impose restrictions on the import of navy vessels, aircraft, and other industrial products as well as banning Western airlines from flying over Russia on routes to and from Asia, which would significantly increase flight time and costs.

Most observers felt that Putin underestimated the West's resolve in imposing economic pressure against Russia for its role in the Ukrainian crisis. Putin appeared to count on the West's inability to formulate a meaningful set of economic sanctions. However, the sanctions did come about, and the costs were higher than Putin reckoned.

At the writing of this text in 2018, the sanctions were still in effect. Why have the sanctions proved so resilient? For starters, Europe and the United States demonstrated strong leadership and solidarity regarding the importance of sanctions imposed against Russia. Also, the economic sanctions did not significantly harm the economies of Europe or the United States. Finally, Europe and the United States agreed to a simple criterion for a possible lifting of sanctions—as long as Russia continued to control parts of the Ukraine, there was no justification to remove the sanctions. It remains to be seen how the sanctions imposed against Russia will play out.

SUMMARY

1. U.S. trade policies have reflected the motivation of many groups, including government officials, labor leaders, and business management.
2. U.S. tariff history has been marked by ups and downs. Many of the traditional arguments for tariffs (revenue, jobs) have been incorporated into U.S. tariff legislation.
3. The Smoot–Hawley Act of 1930 raised U.S. tariffs to an all-time high, with disastrous results. Passage of the Reciprocal Trade Act of 1934 resulted in generalized tariff reductions by the United States as well as the enactment of most favored nation provisions.
4. The purposes of the General Agreement on Tariffs and Trade (GATT) were to decrease trade barriers and place all nations on an equal footing in trading relations. In 1995, GATT was transformed into the World Trade Organization (WTO), which embodies the main provisions of GATT and provides a mechanism intended to improve the process of resolving trade disputes among member nations. The Tokyo Round and Uruguay Round of multilateral trade negotiations went beyond tariff reductions to liberalize various nontariff trade barriers.
5. Trade remedy laws can help protect domestic firms from stiff foreign competition. These laws include the escape clause, provisions for antidumping and countervailing duties, and Section 301 of the 1974 Trade Act, which addresses unfair trading practices of foreign nations.
6. The escape clause provides temporary protection to U.S. producers who desire relief from foreign imports that are fairly traded.
7. Countervailing duties are intended to offset any unfair competitive advantage that foreign producers might gain over domestic producers because of foreign subsidies.
8. Economic theory suggests that if a nation is a net importer of a product subsidized or dumped by foreigners, the nation as a whole gains from the foreign subsidy or dumping. This is because the gains to domestic consumers of the subsidized or dumped good more than offset the losses to domestic producers of the import-competing goods.

9. U.S. antidumping duties are intended to neutralize two unfair trading practices: export sales in the United States at prices below average total cost, and international price discrimination in which foreign firms sell in the United States at a price lower than that charged in the exporter's home market.
10. Section 301 of the Trade Act of 1974 allows the U.S. government to levy trade restrictions against nations that are practicing unfair competition, if trade disagreements cannot be successfully resolved.
11. Intellectual property includes copyrights, trademarks, and patents. Foreign counterfeiting of intellectual property has been a significant problem for many industrial nations.
12. Because foreign competition may displace import-competing producers, the United States and other nations have initiated programs of trade adjustment assistance involving government aid to adversely affected businesses, workers, and communities.
13. The United States has been reluctant to formulate an explicit industrial policy in which government picks winners and losers among products and firms. Instead, the U.S. government has generally taken a less activist approach in providing assistance to domestic producers (such as the Export-Import Bank and export trade associations).
14. According to the strategic trade policy concept, government can assist firms in capturing economic profits from foreign competitors. The strategic trade policy concept applies to firms in imperfectly competitive markets.
15. Economic sanctions consist of trade and financial restraints imposed on foreign nations. They have been used to preserve national security, protect human rights, and combat international terrorism.

KEY CONCEPTS AND TERMS

Countervailing duty (p. 209)	Kennedy Round (p. 195)	Smoot–Hawley Act (p. 191)
Doha Round (p. 196)	Most favored nation (MFN) clause (p. 193)	Strategic trade policy (p. 228)
Economic sanctions (p. 230)	Multifiber Arrangement (MFA) (p. 208)	Tokyo Round (p. 196)
Escape clause (p. 206)	Normal trade relations (p. 193)	Trade adjustment assistance (p. 220)
Export-Import Bank (p. 224)	Reciprocal Trade Agreements Act (p. 192)	Trade promotion authority (p. 206)
Fast track authority (p. 206)	Safeguards (p. 206)	Trade remedy laws (p. 206)
General Agreement on Tariffs and Trade (GATT) (p. 193)	Section 301 (p. 216)	Uruguay Round (p. 196)
Intellectual property rights (IPRs) (p. 217)		World Trade Organization (WTO) (p. 193)

STUDY QUESTIONS

1. To what extent have the traditional arguments that justify protectionist barriers actually been incorporated into U.S. trade legislation?
2. At what stage in U.S. trade history did protectionism reach its high point?
3. What is meant by the most favored nation clause, and how does it relate to the tariff policies of the United States?
4. GATT and its successor, the World Trade Organization, have established a set of rules for the commercial conduct of trading nations. Explain.
5. What are trade remedy laws? How do they attempt to protect U.S. firms from unfairly (fairly) traded goods?
6. What is intellectual property? Why has intellectual property become a major issue in recent rounds of international trade negotiations?
7. How does the trade adjustment assistance program attempt to help domestic firms and

workers who are displaced as a result of import competition?

8. Under the Tokyo Round of trade negotiations, what were the major policies adopted concerning non-tariff trade barriers? What about the Uruguay Round?
9. Describe the industrial policies adopted by the U.S. government. How have these policies differed from those adopted by Japan?
10. If the United States is a net importer of a product that is being subsidized or dumped by Japan, not only do U.S. consumers gain, but they also gain more than U.S. producers lose from the Japanese subsidies or dumping. Explain why this is true.
11. What is the purpose of strategic trade policy?
12. What is the purpose of economic sanctions? What problems do they pose for the nation initiating the sanctions? When are sanctions most successful in achieving their goals?
13. Assume that the nation of Spain is “small” and unable to influence the Brazilian (world) price of steel. Spain’s supply and demand schedules are illustrated in Table 6.10. Assume that Brazil’s price is \$400 per ton of steel. Using graph paper, plot the demand and supply schedules of Spain and Brazil on the same graph.
 - a. With free trade, how many tons of steel will be produced, purchased, and imported by Spain? Calculate the dollar value of Spanish producer and consumer surpluses.

TABLE 6.10**Steel Supply and Demand for Spain**

Price	Quantity (million tons) Supplied	Quantity (million tons) Demanded
\$0	0	12
200	2	10
400	4	8
600	6	6
800	8	4
1,000	10	2
1,200	12	0

- b. Suppose the Brazilian government grants its steel firms a production subsidy of \$200 per ton. Plot Brazil’s subsidy adjusted supply schedule on your graph.
 - (1) What is the new market price of steel? At this price, how much steel will Spain produce, purchase, and import?
 - (2) The subsidy helps/hurts Spanish firms because their producer surplus rises/falls by \$____. Spanish steel users realize a rise/fall in the consumer surplus of \$____. The Spanish economy as a whole benefits/suffers from the subsidy by an amount totaling \$____.

EXPLORING FURTHER

For a discussion of the welfare effects of strategic trade policy, go to *Exploring Further 6.1*, which can be found in MindTap.

CHAPTER **7**

Trade Policies for the Developing Nations



It is a commonly accepted practice to array all nations according to real income and then draw a dividing line between the advanced and developing ones. Included in the category of **advanced nations** are those of North America and Western Europe, plus Australia, New Zealand, and Japan. Most nations of the world are classified as developing, or less developed, nations. The **developing nations** are most of those in Africa, Asia, Latin America, and the Middle East. Table 7.1 provides economic and social

TABLE 7.1

Basic Economic and Social Indicators for Selected Nations, 2015

	Gross Domestic Product per Capita*	Life Expectancy (years)	ADULT LITERACY (PERCENT)	
			Male	Female
Switzerland	\$62,558	83	99	99
United States	56,116	79	99	99
Japan	40,763	84	99	99
Chile	23,367	82	97	97
Mexico	16,988	77	96	94
Algeria	14,688	75	86	73
Indonesia	11,058	69	97	94
Guinea	1,209	59	38	23
Burundi	727	57	88	83

*Converted into international dollars using purchasing power parity rates. An international dollar has the same purchasing power as a U.S. dollar has in the United States.

Source: From the World Bank at <http://www.worldbank.org/data>.

indicators for selected nations. In general, advanced nations are characterized by relatively high levels of gross domestic product per capita, longer life expectancies, and higher levels of adult literacy. Most of the world's population lives in the poorer developing countries.

Although international trade can provide benefits to domestic producers and consumers, some economists maintain that the current international trading system hinders economic development in the developing nations. They believe that conventional international trade theory based on the principle of comparative advantage is irrelevant for these nations. This chapter examines the reasons some economists provide to explain their misgivings about the international trading system. The chapter also considers policies aimed at improving the economic conditions of the developing nations.

Developing Nation Trade Characteristics

If we examine the characteristics of developing nation trade, we find that developing nations are highly dependent on advanced nations. A majority of developing nations' exports goes to the advanced nations, and most developing nations' imports originate in advanced nations. Trade among developing nations is relatively minor, although it has increased in recent years.

Another characteristic is the composition of developing nations' exports, with its emphasis on **primary products** (agricultural goods, raw materials, and fuels). Of the manufactured goods that are exported by developing nations, many (such as textiles) are labor intensive and include only modest amounts of technology in their production.

In the past three decades, the dominance of primary products in developing nation trade has lessened. Many developing nations have been able to increase their exports of manufactured goods and services relative to primary products: These nations include China, India, Mexico, South Korea, Hong Kong, Bangladesh, Sri Lanka, Turkey, Morocco, Indonesia, Vietnam, and so on. Nations that have integrated into the world's industrial markets have realized significant poverty reduction.

How have developing nations been able to move into exports of manufactured products? Investments in both people and factories have played a role. The average educational levels and capital stock per worker have risen sharply throughout the developing world. Also, improvements in transport and communications, in conjunction with developing nation reforms, allowed the production chain to be broken into components, with developing nations playing a key role in global production sharing. Also, the liberalization of trade barriers in developing nations after the mid-1980s increased their competitiveness. This increase was especially true for manufactured goods and processed primary products. Developing nations are gaining ground in higher-technology exports. Nevertheless, they have been frustrated about modest success in exporting these goods to advanced nations.

Many developing nations with a total population of around 2 billion people still have not integrated strongly into the global industrial economy; many of these nations are in Africa and the former Soviet Union. Their exports usually consist of a narrow range of primary products. These nations have often been handicapped by poor infrastructure, inadequate education, rampant corruption, and high trade barriers. Also, transport costs to advanced nation markets are often higher than the tariffs on their goods, so that transport costs are even more of a barrier to integration than the trade policies of rich nations. For these developing nations, incomes have been falling and poverty has been rising in the past 20 years. It is important for them to diversify exports by breaking into global markets for manufactured goods and services where possible.

Tensions between Developing Nations and Advanced Nations

Despite the trade frustrations of developing nations, most scholars and policymakers today agree that the best strategy for a poor country to develop is to take advantage of international trade. In the past two decades, many developing nations saw the wisdom of this strategy and opened their markets to international trade and foreign investment. Ironically, despite scholars' support for this change, the advanced world has sometimes maintained its own barriers to imports from these developing nations. Why is this so?

Think of the world economy as a ladder. On the bottom rungs are developing nations that produce mainly textiles and other low-tech goods. Toward the top are the United States, Japan, and the other advanced nations that manufacture sophisticated software, electronics, and pharmaceuticals. Up and down the middle rungs are all the other nations, producing everything from memory chips, to autos, to steel. From this perspective, economic development is simple: Everyone attempts to climb to the next rung. This process works well if the topmost nations can create new industries and products, adding another rung to the ladder—older industries can move overseas while new jobs are generated at home. But if innovation stalls at the highest rung, then Americans must compete with lower-wage workers in developing nations.

A predicament faced by developing nations is that in order to make progress, they must displace producers of the least advanced goods that are still being produced in the advanced nations. If Zambia is going to produce textiles and apparel, it will compete against American and European producers of these goods. As producers in advanced nations suffer from import competition, they tend to seek trade protection in order to avoid it. However, this protection denies critical market access to developing nations, thwarting their attempts to grow. Thus, there is a bias against their catching up to the advanced nations.

Those who are protected in advanced nations from competition with developing nations tend to include those who are already near the bottom of the advanced nations' income distributions. Many of these people work in labor-intensive industries and have limited skills and low wages. Income redistribution programs ought to aid, not hinder, these people. To some extent, advanced nations face a trade-off between helping their own poor and helping the world's poor. Critics note that the world as a whole needs to treat all poor as its own and those international institutions ought to ensure fairness to all who are in poverty. The World Trade Organization (WTO) is responsible for preventing advanced nations' trade policies from tilting too far in favor of their own people and against the rest of the world. This is why recent WTO meetings have been filled with tensions between poor and rich nations.

Providing developing nations with greater access to the markets of advanced nations will not solve all the developing nations' problems. They face structural weaknesses in their economies that are compounded by nonexistent or inadequate institutions and policies in the fields of law and order, sustainable macroeconomic management, and public services.

Trade Problems of the Developing Nations

The theory of comparative advantage maintains that all nations can enjoy the benefits of free trade if they specialize in the production of those goods in which they have a comparative advantage and exchange some of them for goods produced by other nations.

Policymakers in the United States and many other advanced nations maintain that the market-oriented structure of the international trading system furnishes a setting in which the benefits of comparative advantage can be realized. They claim that the existing

international trading system has provided widespread benefits and that the trading interests of all nations are best served by pragmatic, incremental changes in the existing system. Advanced nations also maintain that to achieve trading success, they must administer their own domestic and international economic policies.

On the basis of their trading experience with advanced nations, some developing nations have become dubious of the *distribution* of trade benefits between themselves and advanced nations. They have argued that the protectionist trading policies of advanced nations hinder the industrialization of many developing nations. Accordingly, developing nations have sought a new international trading order with improved access to the markets of advanced nations. Among the problems that have plagued developing nations have been unstable export markets, worsening terms of trade, and limited access to the markets of advanced nations.

Unstable Export Markets

One characteristic of some developing nations is that their exports are concentrated in only one or a few primary products. For example, about 90 percent of Saudi Arabia's export revenues come from oil exports, 80 percent of Burundi's export revenues come from coffee exports, and 60 percent of Zambia's export revenues come from copper exports. A poor harvest or a decrease in market demand for that product can significantly reduce export revenues and seriously disrupt domestic income and employment levels.

Economists maintain that a key factor underlying the instability of primary-product prices and producer revenues is the low price elasticity of the demand and supply schedules for products such as tin, copper, and coffee.¹ Recall that the price elasticity of demand (supply) refers to the percentage change in quantity demanded (supplied) resulting from a 1 percent change in price. To the extent that demand and supply schedules are relatively *inelastic*, suggesting that the percentage change in price exceeds the percentage change in quantity, a small shift in either schedule can induce a large change in price and revenues.

Figure 7.1 illustrates the supply and demand schedules for coffee, pertaining to the market as a whole. Assume that these schedules are highly inelastic. The market is in equilibrium at point *A*, where the market supply schedule S_0 intersects the market demand schedule D_0 . The revenues of coffee producers total \$22.5 million, determined by multiplying the equilibrium price (\$4.50) times the quantity of pounds sold (5 million).

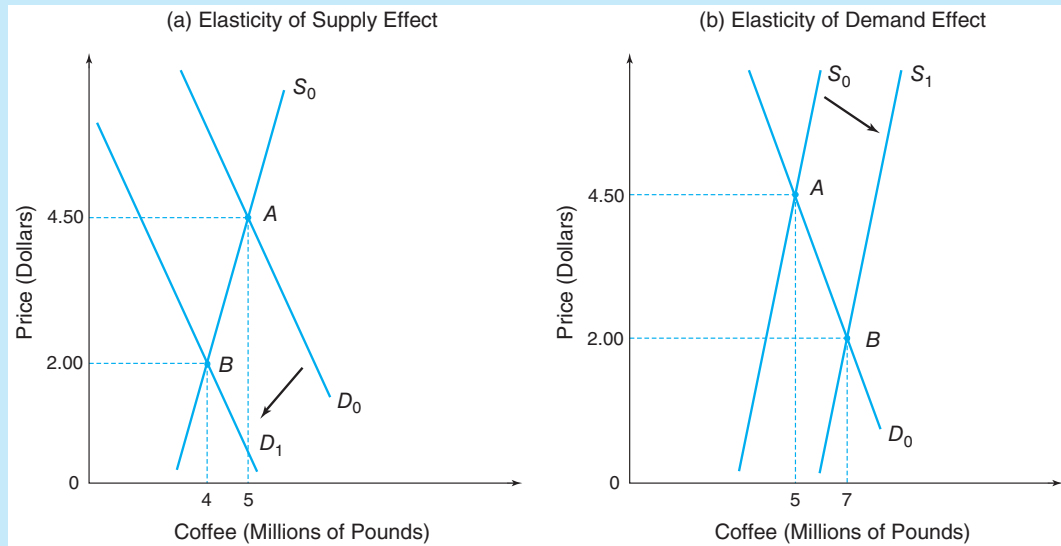
Referring to Figure 7.1(a), suppose that decreasing foreign incomes cause the market demand curve for coffee to decrease to D_1 . With the supply of coffee being inelastic, the decrease in demand causes a substantial decline in market price, from \$4.50 to \$2.00 per pound. The revenue of coffee producers falls to \$8 million. Part of this decrease represents a fall in producer profit. We conclude that coffee prices and earnings can be highly volatile when market supply is inelastic.

Not only do changes in demand induce wide fluctuations in price when supply is inelastic, but changes in supply induce wide fluctuations in price when demand is inelastic. The latter situation is illustrated in Figure 7.1(b). Suppose that favorable growing conditions cause a rightward shift in the market supply curve of coffee to S_1 . The result is a substantial drop in price from \$4.50 to \$2 per pound and producer revenues fall to \$14 million ($\2×7 million pounds = \$14 million). We see that prices and revenues can be volatile when demand conditions are inelastic.

¹For most commodities, price elasticities of demand and supply are estimated to be in the range of 0.2–0.5, suggesting that a 1 percent change in price results in only a 0.2 percent change in quantity. A classic empirical study of this topic comes from Jerre Behman, "International Commodity Agreements: An Evaluation of the UNCTAD Integrated Commodity Program," in William Cline, ed., *Policy Alternatives for a New International Economic Order* (New York: Praeger, 1979), pp. 118–121.

FIGURE 7.1

Export Price Instability for a Developing Nation



When the supply of a commodity is highly price inelastic, decreases (or increases) in demand will generate wide variations in price. When the demand for a commodity is highly price inelastic, increases (or decreases) in supply will generate wide variations in price.

Falling Commodity Prices Threaten Growth of Exporting Nations

During the first decade of the 2000s, increasing commodity prices and favorable growing conditions benefitted producers and governments in many developing nations. Higher prices resulted in rising profits and increasing tax revenues that were used by governments to pay off some of their debts and spend more on social programs. In Latin America, stronger commodity markets contributed to economic growth that averaged 5 percent per year during 2003–2008 as compared to 3.5 percent per year during the previous three decades.

However, that upward cycle took a sharp hit when many advanced economies plunged into the Great Recession of 2007–2009. As these economies shrank, so did their demand for commodities. Lower demand resulted in a dramatic tumbling in the prices of copper, tin, iron ore, soybeans, oil, and the like. As export revenues declined, commodity-producing nations such as Peru and Bolivia had to put on the shelf natural resource investments such as iron ore extraction.

Brazil paid a steep price for relying on primary products, such as soybeans and iron ore, for 40 percent of its exports. The price of soybeans decreased from \$600 per ton to \$365 per ton during 2008–2009. As Brazil's export prices declined, so did its once sizable trade surplus. Brazil's corporations, such as mining giant Companhia Vale do Rio Doce, had to cut back production and lay off workers. Also, the region's big gas and oil producers, including Bolivia, Ecuador, and Venezuela, were hit hard by the global economic downturn.

The economies of many developing nations are tied to primary products and a majority of their exports go to advanced nations. When advanced nations encounter economic downturns, they can be quickly transmitted to their developing country trading partners as seen in the Great Recession of 2008–2009.

Worsening Terms of Trade

How the gains from international trade are distributed among trading partners has been controversial, especially among developing nations whose exports are concentrated in primary products. These nations generally maintain that the benefits of international trade accrue disproportionately to the advanced nations.

Developing nations complain that their commodity terms of trade have deteriorated in the past century or so, suggesting that the prices of their exports relative to their imports have fallen. Worsening terms of trade have been used to justify the refusal of many developing nations to participate in trade liberalization negotiations. It also has underlain developing nations' demands for preferential treatment in trade relations with advanced nations.

Observers maintain that the monopoly power of manufacturers in the advanced nations results in higher prices. Gains in productivity accrue to manufacturers in the form of higher earnings rather than price reductions. Observers further contend that the export prices of primary products of developing nations are determined in competitive markets. These prices fluctuate downward as well as upward. Gains in productivity are shared with foreign consumers in the form of lower prices. Developing nations maintain that market forces cause the prices they pay for imports to rise faster than the prices commanded by their exports, resulting in a deterioration in their commodity terms of trade. As income rises, people tend to spend more on manufactured goods than primary goods, thus contributing to a worsening in the developing nations' terms of trade.

The developing nations' assertion of worsening commodity terms of trade was supported by a United Nations (UN) study in 1949.² The study concluded that from the period 1876–1880 to 1946–1947, the prices of primary products compared with those of manufactured goods fell by 32 percent. Because of inadequacies in data and the problems of constructing price indexes, the UN study was hardly conclusive. Other studies led to opposite conclusions about terms of trade movements.

In 2004, economists at the United Nations found that between 1961 and 2001, the average prices of agricultural commodities sold by developing nations fell by almost 70 percent relative to the price of manufactured goods purchased from developed nations. Such terms of trade declines were especially harmful for the poorest nations of sub-Saharan Africa. Also, the World Bank estimated that between 1970 and 1997 declining terms of trade cost non-oil-exporting nations in Africa the equivalent of 119 percent of their combined annual gross domestic product in lost revenues. In theory, a decline in the terms of trade could be counteracted by increases in the quantity produced and exported so as to maintain or increase the value of export earnings. In practice, export quantities did not grow sufficiently in the nations of Africa to cover the loss.³

²United Nations Commission for Latin America, *The Economic Development of Latin America and Its Principal Problems*, 1950, available at <http://archivo.cepal.org/pdfs/cdPrebisch/002.pdf>.

³Food and Agriculture Organization (FAO) of the United Nations, *The State of Agricultural Commodity Markets*, Rome, Italy, 2004, pp. 8–12. See also Kevin Watkins and Penny Fowler, *Rigged Rules and Double Standards: Trade, Globalization and the Fight Against Poverty* (Oxford, England: Oxfam Publishing, 2002), Chapter 6.

Regarding other developing nations—such as China, India, and Russia—and other developing world oil exporters, the declining terms of trade argument appears to hold less well in recent years. Many of these nations have been able to realize economies of scale in the production of certain other primary products such as corn or cotton and have diversified their economies away from exclusive reliance on raw material exports.

It is difficult to conclude whether the developing nations as a whole have experienced a deterioration or an improvement in their terms of trade. Conclusions about terms of trade movements become clouded by the choice of the base year used in comparisons, the problem of making allowances for changes in technology and productivity as well as for new products and product qualities, and the methods used to value exports and imports and to weight the commodities used in the index.

INTERNATIONAL TRADE APPLICATION

Does Foreign Direct Investment Hinder or Help Economic Development?

One of the requirements for economic development in a low-income economy is an increase in the nation's stock of capital. A developing nation may increase the amount of capital in the domestic economy by encouraging foreign direct investment. Foreign direct investment occurs when foreign firms either locate production plants in the domestic economy or acquire a substantial ownership position in a domestic firm. This topic will be discussed further in Chapter 9.

Many developing economies have attempted to restrict foreign direct investment because of nationalist sentiment and concerns about foreign economic and political influence. One reason for this sentiment is that many developing nations have operated as colonies of more developed economies. This colonial experience has often resulted in a legacy of concern that foreign direct investment may serve as a modern form of economic colonialism and that foreign companies might exploit the resources of the host nation.

In recent years, restrictions on foreign direct investment in many developing economies have been substantially reduced as a result of international treaties, external pressure from the International Monetary Fund (IMF) or World Bank, or unilateral actions by governments that have come to believe that foreign direct investment will encourage economic growth in the host nation. This has resulted in a rather dramatic expansion in the level of foreign direct investment in some developing economies.

Foreign direct investment may encourage economic growth in the short run by increasing aggregate demand in the host economy. In the long run, the increase in the

stock of capital raises the productivity of labor, leads to higher incomes, and further increases aggregate demand.



However, another long-run impact comes through the transfer of technological knowledge from advanced to developing economies. Many economists argue that this transfer of technology may be the primary benefit of foreign direct investment.

It is often argued that it is necessary to restrict foreign direct investment in a given industry for national security purposes. This reasoning serves as a justification for prohibitions on investment in defense industries and in other industries that are deemed essential for national security. Most governments would be concerned if their weapons were produced by companies owned by firms in nations that might become future enemies.

Environmentalists are concerned that the growth of foreign direct investment in developing economies may lead to a deterioration in the global environment because investment is expanding more rapidly in nations that have relatively lax environmental standards. The absence of restrictive environmental standards is one of the reasons for the relatively high rate of return on capital investment in less developed economies. Technology transfer from the developed economies may also result in the adoption of more efficient and environmentally sound production techniques than would have been adopted in the absence of foreign investment.

What do you think? Do you feel that foreign direct investment is beneficial to developing countries?

Source: John Kane, *Does Foreign Direct Investment Hinder or Help Economic Development?* South-Western Policy Debate, 2004.

Limited Market Access

In the past two decades, developing nations as a whole have improved their penetration of world markets. Global protectionism has been a hindrance to their market access. This is especially true for agriculture and labor-intensive manufactured products such as clothing and textiles. These products are important to the world's poor because they represent more than half of low-income nations' exports and about 70 percent of least developed nations' export revenues.

Tariffs imposed by the advanced nations on imports from developing nations tend to be higher than those they levy on other advanced nations. The differences in tariff averages reflect in part the presence of major trading blocs such as the European Union (EU) and the North American Free Trade Agreement (NAFTA), which have abolished tariffs for advanced nation trade partners. Also, because developing nations did not actively participate in multilateral trade liberalization agreements prior to the 1990s, their products tended to be omitted from the sharp reductions in tariffs made in those rounds. Average tariff rates in rich nations are low, but they maintain barriers in exactly the areas where developing nations have comparative advantage: agriculture and labor-intensive manufactured goods.

Developing nations also are plagued by tariff escalation, as discussed in Chapter 4. In advanced nations, tariffs escalate steeply, especially on agricultural products. Tariff escalation has the potential of decreasing demand for processed imports from developing nations, restricting their diversification into higher value-added exports. Though less prevalent, tariff escalation also affects imports of industrial products, especially at the semi-processed stage. Examples of such products, in which many developing nations have a comparative advantage, include textiles and clothing, leather and leather products, wood, paper, furniture, metals, and rubber products.

Moreover, protectionist barriers have caused developing country producers of textiles and clothing to forego sizable export earnings. For decades, advanced nations imposed quotas on imports of these products. Although the Uruguay Round Agreement on Textiles and Clothing resulted in the abolishment of the quotas in 2005, market access in textiles and clothing will remain restricted because tariff barriers are high.

Antidumping and countervailing duties have become popular substitutes for traditional trade barriers that are gradually being reduced in the course of regional and multilateral trade liberalization. Developing nations have argued that advanced nations such as the United States have limited access to their markets through aggressive use of antidumping and countervailing duties. Such policies have resulted in significant reductions in export volumes and market shares, according to the developing nations.

Indeed, poor nations have leaned on the United States and Europe to reduce trade barriers. Rich nations note that poor nations need to reduce their own tariffs, which are often higher than those of their rich counterparts, as seen in Table 7.2. Tariff escalation is also widely practiced by developing nations; their average tariff for fully processed agricultural and manufactured products is higher than on unprocessed products. Although trade among developing nations is a much smaller share of total trade, average tariffs in manufactured goods are about three times higher for trade among developing nations than for exports to advanced nations. Critics note that developing nations are part of their own problem and they should liberalize trade.

However, this argument does not sit well with many poor nations. They contend that quickly reducing tariffs could throw their already fragile economies into an even worse state. Just as is the case in rich nations that reduce tariffs, some workers will inevitably lose jobs as businesses switch to the lowest cost centers. Unlike the United States and European nations, poor nations do not have a social safety net and reeducation programs to cushion the blow. The message that the developing world receives is that it should do some market

TABLE 7.2**Tariffs of Selected Developing Nations and Advanced Nations, All Products, 2015**

Country	Average Applied Tariff Rate*
Maldives	36.8%
Bahamas	33.9
Bhutan	22.3
South Korea	13.9
Brazil	13.5
India	13.4
Russian Federation	7.8
European Union	5.1
Japan	4.0
United States	3.5
Hong Kong	0.0

*Average applied tariff rates are duties that are actually charged on imports. These can be below the bound rates, which are commitments to increase a rate of duty beyond an agreed level. Once a rate of duty is bound, it may not be raised without compensating the affected parties.

Source: From the World Trade Organization, *World Tariff Profiles*, 2016.

liberalization of its own. Nevertheless, it is paradoxical for advanced nations to want developing nations to lift their trade barriers, yet advanced nations like the United States and Canada benefitted from significant trade barriers during their developing stages.

Agricultural Export Subsidies of Advanced Nations

Global protectionism in agriculture is another problem for developing nations. In addition to using tariffs to protect their farmers from import-competing products, advanced nations support their farmers with sizable subsidies. Subsidies are often rationalized on the non-economic benefits of agriculture such as food security and maintenance of rural communities. By encouraging the production of agricultural commodities, subsidies discourage agricultural imports, thus displacing developing country shipments to advanced country markets. Also, the unwanted surpluses of agricultural commodities that result from government support are often dumped onto world markets with the aid of export subsidies. This dumping depresses prices for many agricultural commodities and reduces the revenues of developing nations.

Rice farmers in West Africa complain that U.S. and European export subsidies depress world prices and make it difficult for them to compete. The complaints of West Africa's cotton farmers have mirrored those of its rice farmers. They note that U.S. exports of cotton have been aided by sizable subsidies. West African farmers feel that life is unfair when they must compete against American farmers as well as the U.S. government.

American food aid policies tend to intensify this controversy. It is true that U.S. food donated to the developing world has saved millions of lives made destitute by the failure of their farms. Growers in developing nations complain that the U.S. government purchases surplus grain from American farmers and sends it halfway around the world, instead of first purchasing what foreigners grow. By law, the United States is bound to send homegrown food for assistance, instead of spending cash on foreign produce in all but the most exceptional cases. This policy supports American farmers, processors, and shippers, as well as the

world's hungry. The complaints of West African farmers do not get much sympathy in the United States where farmers oppose the U.S. government's spending of taxpayer money to purchase foreign crops.

Many developing nations are net importers of agricultural products and therefore benefit from these subsidies. Because these subsidies decrease the prices of the products that they purchase on global markets, many developing nations would suffer by their elimination.

Bangladesh's Sweatshop Reputation

Another problem facing developing countries is sweatshop factories. A sweatshop is a factory that has poor and unsafe working conditions, unreasonable hours, unfair wages, child labor, and a lack of benefits for workers. Consider the case of the Bangladesh clothing industry.

Bangladesh provides the world's clothing industry something unique—millions of workers who quickly churn out huge amounts of well-made jeans, T-shirts, and underwear for the lowest wages in the world. Not only has the clothing industry served as a major source of economic growth for Bangladesh, but it is second only to China as the largest exporter of clothing sold by retailers such as Walmart, Sears, Gap, and J. C. Penny.

During 1974–2005, world trade in clothing was governed by the Multifiber Arrangement (MFA), which imposed quotas on the amount developing countries could export to developed countries. Developing countries have a competitive advantage in clothing production because it is labor intensive and has low labor costs. When the MFA expired in 2005, Bangladesh was expected to suffer the most because it would likely face more competition, particularly from China. This was not the case. It turns out that even in the face of other economic giants, Bangladesh's labor was relatively cheap. Orders for Bangladesh's clothes kept coming even after the MFA expired.

Strong demand for clothes resulted in the number of clothing factories in Bangladesh increasing to about 5,500 in 2013, up 30 percent since 2005. This rapid growth strained the country's electrical, power, and gas systems. It also resulted in a shortage of land in Bangladesh that caused many factories to build up, rather than out. Although many multistory factories were safely constructed, some were not: Additional floors were sometimes hastily added without consideration given to fire and safety codes. As a result, working conditions in Bangladesh's clothing industry became suspect as the race to add manufacturing capacity set the stage for a series of horrific accidents—several deadly clothing factory fires and the collapse of an eight-story building that killed more than 1,100 workers in 2013.

Critics maintained that European and American tastes for cheap clothes fueled the Bangladesh clothing boom and ultimately horrific accidents for its workers. They noted that as labor costs in China, the world's low-cost factor floor, have increased rapidly, clothing producers have switched to lower-cost alternatives like Vietnam, Cambodia, and Bangladesh, where the entry-level wage for garment workers is less than \$40 a month—about a fourth of a worker's wages in China. The result is factories striving to meet the growing demands of retailers by ignoring the rights of workers and cutting corners on safety. When the inevitable disasters result, the retailers throw up their hands and distance themselves from what was happening in these factories.

The tragedies of Bangladesh's workers raised the pressure on Western retailers to not only pay compensation to victims, but to also improve fire and building safety in the country for the long run. Collecting compensation for victims after disasters is difficult, especially because of the many layers between brands and the workers who produce their clothing. It is common for retailers to distance themselves from workers through a complex system of production orders placed with multinational middlemen that are then subcontracted to factories that can be three or four steps removed from the retailers.

Following the building collapse in Bangladesh, several of the world's largest European apparel companies agreed to finance fire safety and building improvements in the factories they use in Bangladesh. Walmart publically blacklisted about 250 Bangladesh factories that it considered to be unsafe. Several other major retailers, such as Sears, still considered some of those same factories safe and received shipments of sweaters and other clothing from them. The contrast illustrates how differing standards and approaches can complicate efforts to determine which factories in Bangladesh are safe, even as calls for change grow louder.⁴

Stabilizing Primary-Product Prices

Although developing nations have shown some improvement in exports of manufactured goods, agriculture and natural resource products remain a main source of employment. As we have learned, the export prices and revenues for these products can be quite volatile.

In an attempt to stabilize export prices and revenues of primary products, developing nations have attempted to form **international commodity agreements (ICAs)**. These agreements are between leading producing and consuming nations of commodities such as coffee, rubber, and cocoa about matters such as stabilizing prices, assuring adequate supplies to consumers, and promoting the economic development of producers. To promote stability in commodity markets, ICAs have relied on production and export controls, buffer stocks, and multilateral contracts. We should note that these measures have generally had only limited (if any) success in improving the economic conditions of developing nations and that other methods of helping these nations are needed.

Production and Export Controls

If an ICA accounts for a large share of total world output (or exports) of a commodity, its members may agree on **production and export controls** to stabilize export revenues. Production and export controls affect the price of commodities by influencing the world supply of the commodity. The total quantity of production or exports allowed under a commodity agreement is based on the *target price* that is agreed to by member nations. If it is thought that the price of tin will decrease below the target price in the future, producing nations will be assigned a lower production level or export quota. By making tin more scarce, its price will remain at the target level. Conversely, if it is anticipated that the price of tin will increase above the target price in the future, producing nations will be allowed to increase their levels of production and exports.

An obstacle in attempting to impose limits on production and exports is the distribution of the limits among producing nations. If a decline in the total quantity of coffee exports is needed to offset a falling price, how would that decline be allocated among individual producers? Small producers may be hesitant to decrease their levels of output when prices are declining. Another problem is the appearance of new producers of coffee that may be drawn into the market by artificially high prices. Producing nations just embarking on the production or export of coffee would likely be reluctant to reduce their levels of production or exports at that time. Producers have the incentive to cheat on output restrictions and enforcement is difficult.

⁴“Major Retailers Join Bangladesh Safety Plan,” *The New York Times*, May 13, 2013; “Apparel Makers Promise Bangladesh Factory Safety,” *Dow Jones Business News*, May 13, 2013; Jonathan Lahey and Anne D’Innocenzio, “Bangladesh Increasingly Risky for Clothing Makers,” *The Boston Globe*, May 13, 2013; “Before Dhaka Collapse, Some Firms Fled Risk,” *The Wall Street Journal*, May 8, 2013; and “Global Standards for Garment Industry under Scrutiny after Bangladesh Disaster,” *PBS NewsHour*, April 26, 2013.

Buffer Stocks

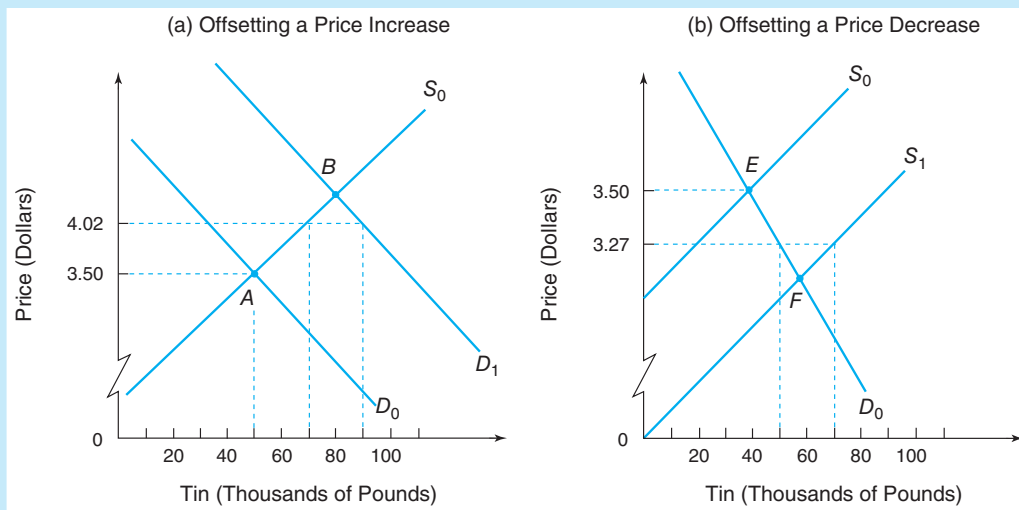
Another technique for limiting commodity price swings is the **buffer stock**, in which a producers' association (or international agency) is prepared to buy and sell a commodity in large amounts. The buffer stock consists of supplies of a commodity financed and held by the producers' association. The buffer stock manager *buys* from the market when supplies are abundant and prices are falling below acceptable levels, and *sells* from the buffer stock when supplies are tight and prices are high.

Figure 7.2 illustrates the hypothetical price stabilization efforts of the International Tin Agreement. Assume that the association sets a price range with a floor of \$3.27 per pound and a ceiling of \$4.02 per pound to guide the stabilization operations of the buffer stock manager. Starting at equilibrium point *A* in Figure 7.2(a), suppose the buffer stock manager sees the demand for tin rising from D_0 to D_1 . To defend the ceiling price of \$4.02, the manager must be prepared to sell 20,000 pounds of tin to offset the excess demand for tin at the ceiling price. Conversely, starting at equilibrium point *E* in Figure 7.2(b), suppose the supply of tin rises from S_0 to S_1 . To defend the floor price of \$3.27, the buffer stock manager must purchase the 20,000-pound excess supply that exists at that price.

Proponents of buffer stocks contend that the scheme offers the primary producing nations several advantages. A well-run buffer stock can promote economic efficiency because primary producers can plan investment and expansion if they know that prices will not gyrate. It is also argued that soaring commodity prices invariably ratchet industrial

FIGURE 7.2

Buffer Stock: Price Ceiling and Price Support



During periods of rising tin demand, the buffer stock manager sells tin to prevent the price from rising above the ceiling level. However, prolonged defense of the ceiling price may result in depletion of the tin stockpile, which undermines the effectiveness of this price stabilization tool and lends to an upward revision of the ceiling price. During periods of abundant tin supplies, the manager purchases tin to prevent the price from falling below the floor level. Again, prolonged defense of the price floor may exhaust the funds to purchase excess supplies of tin at the floor price and may lead to a downward revision of the floor price.

prices upward, whereas commodity price decreases exert no comparable downward pressure. By stabilizing commodity prices, buffer stocks can moderate the price inflation of the advanced nations. Buffer stocks in this context are viewed as a means of providing primary producers more stability than is allowed by the free market.

Setting up and administering a buffer stock program is not without costs and problems. The basic difficulty in stabilizing prices with buffer stocks is agreeing on a target price that reflects long-term market trends. If the target price is set too low, the buffer stocks will become depleted as the stock manager sells the commodity on the open market in an attempt to hold market prices in line with the target price. If the target price is set too high, the stock manager must purchase large quantities of the commodity in an effort to support market prices. The costs of holding the stocks tend to be high because they include transportation expenses, insurance, and labor costs. In their choice of price targets, buffer stock officials have often made poor decisions. Rather than conduct massive stabilization operations, buffer stock officials will periodically revise target prices should they fall out of line with long-term price trends.

Multilateral Contracts

Multilateral contracts are another method of stabilizing commodity prices. Such contracts generally stipulate a *minimum price* at which importers will purchase guaranteed quantities from the producing nations and a *maximum price* at which producing nations will sell guaranteed amounts to the importers. Such purchases and sales are designed to hold prices within a target range. Trading under a multilateral contract has often occurred among several exporting and importing nations, as in the case of the International Sugar Agreement and the International Wheat Agreement.

One possible advantage of the multilateral contract as a price stabilization device is that, in comparison with buffer stocks or export controls, it results in less distortion of the market mechanism and the allocation of resources. This result is because the typical multilateral contract does not involve output restraints and thus does not check the development of more efficient low-cost producers. If target prices are not set near the long-term equilibrium price, however, discrepancies will occur between supply and demand. Excess demand would indicate a ceiling too low, whereas excess supply would suggest a floor too high. Multilateral contracts also tend to furnish only limited market stability given the relative ease of withdrawal and entry by participating members.

Does the Fair Trade Movement Help Poor Coffee Farmers?

We have seen that low commodity prices are troublesome for producers in developing nations. Can consumers of commodities be of assistance to producers? Consider the case of coffee produced in Nicaragua.

Nicaraguan coffee farmer Santiago Rivera has traveled far beyond his mountain home to publicize what is known as the fair trade coffee movement. Have you heard of fair trade coffee? You soon may. Started in Europe in the early 1990s, the objective of the fair trade coffee movement is to increase the income of poor farmers in developing nations by implementing a system by which the farmers can sell their beans directly to roasters and retailers, bypassing the traditional practice of selling to middlemen in their own nations.

This arrangement permits farmers, who farm mainly in the mountainous regions of Latin America and other tropical regions where high-flavor, high-priced beans sold to gourmet stores are grown, to earn as much as \$1.26 per pound for their beans, compared with the \$0.40 per pound they were getting from middlemen.

Under the fair trade system, farmers organize in cooperatives of as many as 2,500 members that set prices and arrange for export directly to brokerage firms and other distributors.

Middlemen—known as “coyotes” in Nicaragua—previously handled this role. So far, 500,000 of the developing world’s 4 million coffee farmers have joined the fair trade movement. The movement has led to incidents of violence in some places in Latin America, mostly involving the middlemen who are being bypassed.

The fair trade coffee movement is the latest example of how social activists are using free market economics to foster social change. Organizers of the movement say they have signed up eight gourmet roasters and about 120 stores, including big chains like Safeway, Inc. Fair trade coffee carries a logo identifying it as such.

Fair trade achieved great success in Europe, where fair trade coffee sells in 35,000 stores and has sales of \$250 million a year. In some nations like the Netherlands and Switzerland, fair trade coffee accounts for as much as 5 percent of total coffee sales. Based on those achievements, organizers in Europe are expanding their fair trade efforts to include other commodity items, including sugar, tea, chocolate, and bananas. Fair trade activists admit that selling Americans on the idea of buying coffee with a social theme will be more challenging than it was in Europe. Americans, they note, tend to be less aware of social problems in the developing world than Europeans. The fair trade movement has yet to get the support of major U.S. coffee houses such as Maxwell and Folgers. Nevertheless, organizers are trying to nudge Seattle’s two coffee giants, Starbucks Coffee Co. and the Seattle Coffee Co., into agreeing to purchase some of the fair trade coffee. However, critics question the extent to which “fair-traded” coffee actually helps. They note that the biggest winners are not the farmers, but rather the retailers that sometimes charge huge markups on fair-traded coffee while promoting themselves as corporate citizens. They can get away with it because consumers generally are given little or no information about how much of a product’s price goes to farmers.

The OPEC Oil Cartel

Although many developing nations have not seen significant improvements in their economies in recent decades, some have realized notable gains. One such group consists of developing nations endowed with oil reserves. Instead of just forming agreements to stabilize prices and revenues, oil-exporting nations have formed cartels intended to increase price and thus realize “monopoly” profits. The most successful cartel in recent history is the Organization of Petroleum Exporting Countries.

The **Organization of Petroleum Exporting Countries (OPEC)** is a group of nations that sells petroleum on the world market. The OPEC nations attempt to support prices higher than would exist under more competitive conditions to maximize member-nation profits. After operating in obscurity throughout the 1960s, OPEC was able to capture control of petroleum pricing in 1973 and 1974, when the price of oil rose from approximately \$3 to \$12 per barrel. Triggered by the Iranian revolution in 1979, oil prices doubled from early 1979 to early 1980. By 1981, the price of oil averaged almost \$36 per barrel. The market power of OPEC stemmed from a strong and inelastic demand for oil combined with its control of about half of world oil production and two-thirds of world oil reserves. Largely because of world recession and falling demand, oil prices fell to \$11 per barrel in 1986, only to rebound thereafter.

Prior to OPEC, oil-producing nations behaved like individual competitive sellers. Each nation by itself was so unimportant relative to the overall market that changes in its export levels did not significantly affect international prices over a sustained period of time. By agreeing to restrict competition among themselves via production quotas, the oil-exporting nations found that they could exercise considerable control over world oil prices, as seen in the price hikes of the 1970s.

Maximizing Cartel Profits

A **cartel** attempts to support prices higher than they would be under more competitive conditions, thus increasing the profits of its members. Let us consider some of the difficulties encountered by a cartel in its quest for increased profits.

Assume that there are ten suppliers of oil of equal size in the world oil market and that oil is a standardized product. As a result of previous price wars, each supplier charges a price equal to minimum average cost. Suppliers are afraid to raise their price because they fear that the others will not do so and all of their sales will be lost.

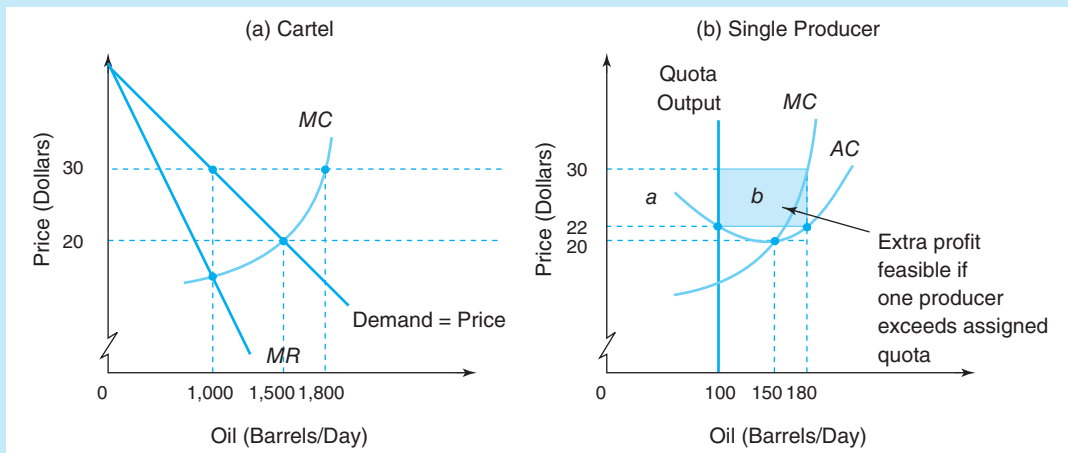
Rather than engage in cutthroat price competition, suppose these suppliers decide to collude and form a cartel. How will a cartel go about maximizing the collective profits of its members? The answer is by behaving like a profit-maximizing monopolist: restrict output and drive up price.

Figure 7.3 illustrates the demand and cost conditions of the ten oil suppliers as a group, Figure 7.3(a), and the group's average supplier, Figure 7.3(b). Before the cartel is organized, the market price of oil under competition is \$20 per barrel. Because each supplier is able to achieve a price that just covers its minimum average cost, economic profit equals zero. Each supplier in the market produces 150 barrels per day. Total industry output equals 1,500 barrels per day ($150 \times 10 = 1,500$).

Suppose the oil suppliers form a cartel in which the main objective is to maximize the collective profits of its members. To accomplish this objective, the cartel must first establish the profit-maximizing level of output; this output is where marginal revenue equals marginal cost. The cartel then divides the cartel output among its members by setting up production quotas for each supplier.

FIGURE 7.3

Maximizing OPEC Profits



As a cartel, OPEC can increase the price of oil from \$20 to \$30 per barrel by assigning production quotas to its members. The quotas decrease output from 1,500 to 1,000 barrels per day and permit producers that were pricing oil at average cost to realize a profit. Each producer has the incentive to increase output beyond its assigned quota, to the point at which the OPEC price equals marginal cost. But if all producers increase output in this manner, there will be a surplus of oil at the cartel price, forcing the price of oil back to \$20 per barrel.

In Figure 7.3(a), the cartel will maximize group profits by restricting output from 1,500 barrels per day to 1,000 barrels per day. This means that each member of the cartel must decrease its output from 150 barrels to 100 barrels per day, as shown in Figure 7.3(b). This production quota results in a rise in the market price of a barrel of oil from \$20 to \$30. Each member realizes a profit of \$8 per barrel ($\$30 - \$22 = \8) and a total profit of \$800 on the 100 barrels of oil produced (area *a*).

The next step is to ensure that no cartel member sells more than its quota. This is a difficult task because each supplier has the incentive to sell more than its assigned quota at the cartel price. But if all cartel members sell more than their quotas, the cartel price will fall toward the competitive level and profits will vanish. Cartels thus attempt to establish penalties for sellers that cheat on their assigned quotas.

In Figure 7.3(b), each cartel member realizes economic profits of \$800 by selling at the assigned quota of 100 barrels per day. However, an *individual* supplier knows that it can increase its profits if it sells more than this amount at the cartel price. Each individual supplier has the incentive to increase output to the level at which the cartel price, \$30, equals the supplier's marginal cost; this occurs at 180 barrels per day. At this output level, the supplier would realize economic profits of \$1,440, represented by area *a + b*. By cheating on its agreed upon production quota, the supplier is able to realize an increase in profits of \$640 ($\$1,440 - \$800 = \640), denoted by area *b*. Note that this increase in profits occurs if the price of oil does not decrease as the supplier expands output; that is, if the supplier's extra output is a negligible portion of the industry supply.

A single supplier may be able to get away with producing more than its quota without significantly decreasing the market price of oil. But if each member of the cartel increases its output to 180 barrels per day to earn more profits, total output will be 1,800 barrels ($180 \times 10 = 1,800$). To maintain the price at \$30, however, industry output must be held to only 1,000 barrels per day. The excess output of 800 barrels puts downward pressure on price, which causes economic profits to decline. If economic profits fall back to zero (the competitive level), the cartel will likely break up. Besides the problem of cheating, several other obstacles arise in forming a cartel:

Number of Sellers Generally speaking, the larger the number of sellers, the more difficult it is to form a cartel. Coordination of price and output policies among three sellers that dominate the market is more easily achieved than when there are ten sellers each having 10 percent of the market.

Cost and Demand Differences When cartel members' costs and product demands differ, it is more difficult to agree on price. Such differences result in a dissimilar profit-maximizing price for each member, so there is no single price that can be agreed upon by all members.

Potential Competition The potential increased profits under a cartel may attract new competitors. Their entry into the market triggers an increase in product supply that leads to falling prices and profits. A successful cartel thus depends on its ability to block the market entry of new competitors.

Economic Downturn Economic downturn is generally problematic for cartels. As market sales dwindle in a weakening economy, profits fall. Cartel members may conclude that they can escape serious decreases in profits by reducing prices, in expectation of gaining sales at the expense of other cartel members.

Substitute Goods The price-making ability of a cartel is weakened when buyers can substitute other goods (coal and natural gas) for the good that it produces (oil).

INTERNATIONAL TRADE APPLICATION

Declining Oil Prices Test OPEC's Unity

The ability of OPEC to withstand declining oil prices was tested in 2014–2016. Oil prices dramatically fell during that period, resulting in a near free fall in gasoline prices in the United States, with prices falling below \$2.80 a gallon. The price at the pump usually follows oil after a few days.

Why the decline in oil prices? The demand for oil was weakening worldwide, just as the global market was flooded with oil. On the demand side, the thirst for oil was declining in Europe, where unemployment was up and industrial production was down, and Japan, where the use of oil by utilities was being replaced by coal, natural gas, and the restarting of nuclear electricity plants. Also, the demand for oil in China and other emerging economies fell as their economies weakened. On the supply side, the U.S. shale-oil drilling boom was a major factor, with domestic oil production being at the highest level in almost a quarter century.

The surplus quantities of oil forced OPEC members to defend their market share at the expense of other members by cutting prices. For example, Saudi Arabia and Nigeria competed with one another in Asia by slashing prices. Therefore, considerable dissension developed within OPEC. At stake was whether OPEC could still operate as a global cartel amid infighting and expanding global production of oil. What made matters worse was that each member of OPEC had a different tolerance for lower prices. Saudi Arabia, Kuwait, and the United Arab



Emirates usually don't need prices as high as Venezuela and Iran to keep their finances in the black.

A possible solution to falling oil prices would be for OPEC to decrease production. But how do you get dissenting members to agree on production cutbacks? It was unclear how such vulnerable OPEC members as Venezuela and Nigeria, with small financial reserves and large government budgets, could afford to reduce production without reopening the spigots. And Saudi Arabia, the largest and most wealthy oil-producing member, was not willing to bear the pain of a unilateral cutback. Moreover, would members cheat on a cutback agreement and continue to produce large quantities of oil? Also, a reduction in OPEC output might not necessarily boost prices because of high output by non-OPEC producers, such as the United States. These were the difficulties that OPEC faced as it wrangled over what to do about falling oil prices. At the writing of this text, the future of OPEC remained unclear.

What do you think? Why is it difficult to run a cartel during periods of decreasing demand and falling prices?

Sources: Clifford Krauss, "OPEC Split as Oil Prices Fall Sharply," *The New York Times*, October 13, 2014; Benoit Faucon, Summer Said, and Sarah Kent, "OPEC Members' Rift Deepens Amid Falling Oil Prices," *The Wall Street Journal*, October 12, 2014; Margaret McQuaile, "Pressure Building on OPEC to Act on Oil Price Fall," *Platts: McGraw Hill Financial*, November 17, 2014; "How Will Plunging Oil Prices Affect the Economy," *PBS NewsHour*, November 28, 2014.

OPEC as a Cartel

OPEC has generally disavowed the term *cartel*. However, its organization is composed of a secretariat, conference of ministers, board of governors, and an economic commission. OPEC has repeatedly attempted to formulate plans for systematic production control among its members as a way of firming up oil prices. However, OPEC hardly controls prices. The group currently controls less than 40 percent of world supply, an insufficient amount to establish an effective cartel. OPEC's production agreements have not always lived up to expectations because too many member nations have violated the agreements by producing more than their assigned quotas. Since 1983, when production quotas were first assigned to members, OPEC's actual production levels have almost always been greater than its target levels, meaning that countries have been selling more oil than their authorized amounts. OPEC does not have any club with which to enforce its edicts.

The exception is Saudi Arabia, owner of the world's largest reserves and lowest production costs. The Saudis spend immense capital to maintain more production capacity than they use, allowing them to influence, or threaten to influence, prices over the short run.

To offset the market power of OPEC, the United States and other importing nations might initiate policies to increase the supply and/or decrease demand. Achieving these measures involves difficult choices for Americans, such as the following:

- *Raising the fuel economy standards mandated by the federal government.* Analysts estimated that if the gas mileage of new cars had increased by only one mile per gallon each year since 1987, and the mileage of light trucks by a half-mile per gallon, the United States would be saving 1.3 million barrels of oil each day. Increasing fuel economy standards would meet resistance from auto producers who would see their production costs increasing because of this policy.
- *Increasing the federal excise tax on gasoline.* Although the resulting hike in the price of gasoline would provide an incentive for consumers to conserve, this would conflict with the preference of Americans for low-priced gasoline. Rising gasoline prices would especially harm low-income consumers with the least ability to pay.
- *Allowing oil companies to drill on federal land designated as wilderness in Alaska, where there is a good chance that oil might be found.* Perhaps, but what happens when the wilderness is destroyed, never to return? Who pays for that?
- *Diversifying imports.* Although it could be expensive, the United States might forge closer ties with oil producers outside the Middle East to diminish dependence on this unstable region. This would require the United States to work even more closely with unsavory regimes in nations like Angola, Indonesia, and Vietnam. OPEC oil is cheap to extract from the ground. While it costs deepwater drillers like ExxonMobil or Conoco \$6 to \$8 to produce a barrel in the Gulf of Mexico or the North Sea, the Saudis and Kuwaitis spend a fraction of that—\$1 a barrel or less. This cost advantage enhances OPEC's market power.
- *Developing alternate sources of energy such as biofuels and wind power.* Perhaps. But these tend to require governmental subsidies financed by taxpayers.

Despite the difficulty of achieving the above measures, change has come about. The rise of OPEC in the 1970s inspired the United States and other countries to produce more energy, including oil. Today, we see modern wind and solar industries, nuclear power, and coal as sources of electric power, the development of new technologies to produce natural gas, and so on. In particular, U.S. crude oil production has dramatically risen as hydraulic fracturing and other technologies have unlocked large resources of oil previously trapped in shale rock in North Dakota and Texas. Shale deposits in other areas, such as Pennsylvania, are yielding mostly natural gas. World oil production is much greater than the early 1970s, as oil production has expanded in the Gulf of Mexico, Canada, and other countries. As a result, OPEC no longer calls the shots in the world oil market as it did years ago.

Aiding the Developing Nations

We have learned that the oil-exporting nations are a special group of developing nations that have realized substantial wealth in recent decades. Most developing nations are not in this favorable situation. Dissatisfied with their economic performance and convinced that many of their problems are because of the shortcomings of the existing international trading system, developing nations have pressed collective demands on the advanced nations for institutions and policies that improve the climate for economic development. Among the institutions and policies that have been created to support developing nations are the World Bank, the International Monetary Fund (IMF), and the generalized system of preferences.

The World Bank

During the 1940s, two international institutions were established to ease the transition from wartime to a peacetime environment and help prevent a recurrence of the turbulent economic conditions of the Great Depression era. The World Bank and the International Monetary Fund were established at the United Nations Monetary and Financial Conference held at Bretton Woods, New Hampshire, in July 1944. Developing nations view these institutions as sources of funds to promote economic development and financial stability.

The **World Bank** is an international organization that provides loans to developing nations aimed toward poverty reduction and economic development. It lends money to member governments and their agencies and to private firms in the member nations. The World Bank is not a “bank” in the common sense. It is one of the UN’s specialized agencies made up of 188 member nations. These nations are jointly responsible for how the institution is financed and how its money is spent.

The “World Bank Group” is the name that has come to be used for five closely associated institutions. The International Bank for Reconstruction and Development and the International Development Association provide low-cost loans and grants to developing nations. The International Finance Corporation provides equity, long-term loans, loan guarantees, and advisory services to developing nations that would otherwise have limited access to capital. The Multilateral Investment Guarantee Agency encourages foreign investment in developing nations by providing guarantees to foreign investors against losses caused by war, civil disturbance, and the like. In addition, the International Center for Settlement of Investment Disputes encourages foreign investment by providing international facilities for conciliation and arbitration of investment disputes, thus helping foster an atmosphere of mutual confidence between developing nations and foreign investors.

The World Bank provides both loans and grants to developing members that cannot obtain money from other sources at reasonable terms. These funds are for specific development projects such as hospitals, schools, highways, and dams. The World Bank is involved in projects as diverse as raising AIDS awareness in Guinea, supporting education of girls in Bangladesh, improving health care delivery in Mexico, and helping India rebuild after a devastating earthquake. The World Bank provides low interest rate loans, and in some cases interest-free loans, to developing nations that have little or no capacity to borrow on market terms.

In recent years, the World Bank has financed debt refinancing activities of some of the heavily indebted developing nations. The bank encourages private investment in developing nations, as shown in Table 7.3. It receives its funds from contributions of wealthy developed nations. Some 10,000 development professionals from nearly every country in the world work in the World Bank’s Washington, DC, headquarters or in its 109 country offices. They provide many technical assistance services for members.

When attempting to help developing nations fight malaria and build dams and schools, the World Bank must also deal with the problem of fraud and corruption: Corrupt government officials and contractors sometimes divert development dollars into their own pockets rather than allowing them to benefit the masses of the poor. Because money is fungible, it is difficult for the World Bank to trace the disbursed funds to identify the source of corruption. Thus, poor nations lose huge amounts of funds from the World Bank because of the misuse of money, yet their taxpayers still have to repay the World Bank. According to critics, between 5 and 25 percent of the funds the World Bank has lent since 1946 have been misused. This misuse has resulted in millions of poverty-stricken people losing opportunities to improve their health, education, and economic condition. For two decades, the World Bank has poured money into poor nations clearly unable to repay. It remains to be seen if the World Bank can adopt safeguards that would ensure the funds entrusted to it are used productively for their intended purpose.

TABLE 7.3**World Bank Lending by Sector, 2016 (Millions of Dollars)**

Developing Nation Sector	Percentage of Total
Agriculture, Fishing, and Forestry	2
Education	6
Energy and Mining	15
Finance	9
Health and Social Services	8
Industry and Trade	11
Information and Communication	1
Public Administration, Law, and Justice	18
Transportation	15
Water, Sanitation, and Flood Protection	<u>15</u>
	100

Source: From the World Bank, "World Bank Lending by Theme and Sector," *Annual Report 2016*, Table 19, available at <http://www.worldbank.org/>.

As globalization transforms the world economy, the World Bank's role is diminishing. There are new competitors that channel funds to developing nations. Sovereign wealth funds from Singapore to Abu Dhabi are searching for profit in remote places. Nations such as China, Brazil, India, and Russia are funding infrastructure and industry for even the poorest nations, to lock in access to raw materials and export markets.

International Monetary Fund

Another source of aid to developing nations (as well as advanced nations) is the **International Monetary Fund (IMF)**, which is headquartered in Washington, DC. Consisting of 188 nations, the IMF can be thought of as a bank for the central banks of member nations. Over a given time period, some nations will face balance-of-payments surpluses, and others will face deficits. A nation with a deficit initially draws on its stock of foreign currencies, such as the dollar, that are accepted in payment by other nations. The deficit nation will sometimes have insufficient amounts of currency. That is when other nations, via the IMF, can provide assistance. By making available currencies to the IMF, the surplus nations channel funds to nations with temporary deficits. Over the long run, deficits must be corrected and the IMF attempts to ensure that this adjustment will be as prompt and orderly as possible.

IMF funds come from two major sources: quotas and loans. Quotas (or subscriptions), which are pooled funds of member nations, generate most IMF funds. The size of a member's quota depends on its economic and financial importance in the world; nations with larger economic importance have larger quotas. The quotas are increased periodically as a means of boosting the IMF's resources. The IMF also obtains funds through loans from member nations. The IMF has lines of credit with major advanced nations as well as with Saudi Arabia.

All IMF loans are subject to some degree of *conditionality*. This attachment means that to obtain a loan, a deficit nation must agree to implement economic and financial policies as stipulated by the IMF. These policies are intended to correct the member's balance-of-payments deficit and promote noninflationary economic growth. The conditionality

attachment to IMF lending has often met strong resistance from deficit nations. The IMF has sometimes demanded that deficit nations undergo austerity programs including severe reductions in public spending, private consumption, and imports in order to live within their means.

Critics of the IMF note that its bailouts may contribute to the so-called *moral hazard* problem, whereby nations realize the benefits of their decisions when things go well but are protected when things go poorly. If nations do not suffer the costs of bad decisions, won't they be encouraged to make other bad decisions in the future? A second area of concern is the contractionary effect of the IMF's restrictive monetary and fiscal policy conditions. Won't such conditions cause business and bank failures, induce a deeper recession, and limit government spending to help the poor? Many analysts feel the answer is yes.

Generalized System of Preferences

Given inadequate access to markets of advanced nations, developing nations have pressed them to reduce their tariff walls. To help developing nations strengthen their international competitiveness and expand their industrial base, many advanced nations have extended nonreciprocal tariff preferences to exports of developing nations. Under this **generalized system of preferences (GSP)**, major advanced nations temporarily reduce tariffs on designated manufactured imports from developing nations below the levels applied to imports from other advanced nations. The GSP is not a uniform system because it consists of many individual schemes that differ in the types of products covered and the extent of tariff reduction. The GSP attempts to promote economic development in developing nations through increased trade rather than foreign aid.

Trade preferences granted by advanced nations are voluntary. They are not WTO obligations. Donor nations determine eligibility criteria, product coverage, the size of preference margins, and the duration of the preference. In practice, advanced country governments rarely grant deep preferences in sectors where developing nations have a large export potential. Thus, developing nations often obtain only limited preferences in sectors where they have a comparative advantage. The main reason for limited preferences is that in some sectors there is strong domestic opposition to liberalization in advanced nations.

Since its origin in 1976, the U.S. GSP program has extended duty-free treatment to about 3,000 items. Criteria for eligibility include not aiding international terrorists and complying with international environmental, labor, and intellectual property laws. The U.S. program grants complete tariff-free and quota-free access to eligible products from eligible nations. Beneficiaries of the U.S. program include 130 developing nations and their dependent territories. Like the GSP programs of other advanced nations, the U.S. program excludes certain import sensitive products from preferential tariff treatment.

Textiles and apparel, footwear, and some agricultural products are not eligible for the GSP. Also, a country's GSP eligibility for a given product may be removed if annual exports of that product reach \$100 million or if there is significant damage to domestic industry. From time to time, as GSP participants have grown wealthier, they have been "graduated" out of the program. Among the alumni are Hong Kong, Singapore, Malaysia, Taiwan, and Singapore.

Although the GSP program provides preferential access to advanced nations' markets, several factors erode its effectiveness in reducing trade barriers faced by poor nations. First, preferences mainly apply to products that already face relatively low tariffs. Second, tariff preferences can also be eroded by nontariff measures, such as antidumping duties and safeguards. Products and nations have been removed from GSP eligibility because of lobbying by domestic interest groups in importing nations. Preferences do little to assist the majority

of the world's poor. Most of those living on less than \$1 per day live in nations like India and Pakistan that receive limited preferences in products in which they have a comparative advantage. As a result, developing nations have been frustrated about limited access to the markets of advanced nations.

Does Aid Promote Growth of Developing Nations?

Does aid promote growth of the developing nations? Debates about the effectiveness of aid go back decades. Critics maintain that aid has fostered government bureaucracies, prolonged bad governments, favored the wealthy in poor nations, or just been squandered. They note widespread poverty in South Asia and Africa despite four decades of aid, and point out nations that have received sizable aid have had miserable records—such as Haiti, the Democratic Republic of the Congo, Somalia, and Papua New Guinea. In their view, aid programs should be substantially altered, drastically cut, or eliminated altogether.

Proponents counter that these contentions, while partially true, are overstated. They indicate that although aid has sometimes been ineffective, it has enhanced poverty reduction and growth in some nations and prevented worse performance in others. Many of the shortcomings of aid have more to do with donors than beneficiaries, especially as much aid is doled out to political allies instead of promoting development. They cite a number of successful nations that have received significant aid such as South Korea, Indonesia, Botswana, Mozambique, and Tanzania. In the 40 years since aid became widespread, they note that poverty indicators have declined in many nations and health and education indicators have increased faster than during any other 40-year period in human history.

Researchers at the Center for Global Development in Washington, DC, have attempted to resolve this debate by distinguishing between types of aid granted to developing nations. Aid for the development of infrastructure—such as transportation systems, communications, energy generation, and banking services—is considered to have relatively strong effects on economic growth and is designated as *growth-oriented aid*. However, aid for disaster and humanitarian relief, food supply, water sanitation, and the like tends to have less immediate effects on economic growth. Each \$1 in growth-oriented aid over a four-year period was found to yield \$1.64 in increased income in the average recipient country, amounting to an annual rate of return of about 13 percent. The researchers concluded that there is a positive, causal relation between growth-oriented aid and growth on average, although not in every country. Aid flows aimed at growth have produced results.⁵

Economic Growth Strategies: Import Substitution versus Export-Led Growth

Besides seeking economic assistance from advanced nations, developing nations have pursued two competing strategies for industrialization, an inward-looking strategy (import substitution) in which industries are established largely to supply the domestic market and foreign trade is assigned negligible importance, and an outward-looking strategy (export-led growth) of encouraging the development of industries in which the country enjoys comparative advantage, with heavy reliance on foreign nations as purchasers of the increased production of exportable goods.

⁵Steven Radelet, Michael Clemens, and Rikhil Bhavnani, "Aid and Growth," *Finance and Development*, September 2005, pp. 16–20.

Import Substitution

During the 1950s and 1960s, the industrialization strategy of **import substitution** became popular in developing nations such as Argentina, Brazil, and Mexico; some nations still use it today. Import substitution involves extensive use of trade barriers to protect domestic industries from import competition. The strategy is inward oriented in that trade and industrial incentives favor production for the domestic market over the export market. If fertilizer imports occur, import substitution calls for establishment of a domestic fertilizer industry to produce replacements for fertilizer imports. In the extreme, import substitution policies could lead to complete self-sufficiency.

The rationale for import substitution arises from the developing nations' perspective on trade. Many developing nations feel that they cannot export manufactured goods because they cannot compete with established firms of the advanced nations, especially in view of the high trade barriers maintained by advanced nations. Given the need for economic growth and development, developing nations have no choice but to manufacture for themselves some of the goods they now import. The use of trade restrictions blocks imports, and the domestic market is reserved for domestic manufacturers. This rationale is often combined with the infant industry argument: Protecting start-up industries will allow them to grow to a size where they can compete with the industries of advanced nations.

In one respect, import substitution appears logical: If a good is demanded and imported, why not produce it domestically? The economist's answer is that it may be more costly to produce it domestically and cheaper to import it; comparative advantage should decide which goods are imported and which are exported.

Encouraging economic development via import substitution has several advantages:

- The risks of establishing a home industry to replace imports are low because the home market for the manufactured good already exists.
- It is easier for a developing nation to protect its manufacturers against foreign competitors than to force advanced nations to reduce their trade restrictions on products exported by developing nations.
- To avoid the import tariff walls of the developing country, foreigners have an incentive to locate manufacturing plants in the country, providing jobs for local workers.

In contrast to these advantages, there are several disadvantages:

- Because trade restrictions shelter domestic industries from international competition, they have no incentive to increase their efficiency.
- Given the small size of the domestic market in many developing nations, manufacturers cannot take advantage of economies of scale and thus have high unit costs.
- Because the resources employed in the protected industry would otherwise have been employed elsewhere, protection of import-competing producers automatically discriminates against all other industries, including potential exporting ones.
- Once investment is sunk in activities that were profitable only because of tariffs and quotas, any attempt to remove those restrictions is generally strongly resisted.
- Import substitution also breeds corruption. The more protected the economy, the greater the gains to be had from illicit activity such as smuggling.

During the 1970s, criticisms of import substitution industrialization became increasingly common. Empirical studies appeared to suggest that developing countries that adopted freer trade policies tended to grow faster than those that adopted protectionist policies. Therefore, many developing countries removed quotas and decreased tariffs by the mid-1980s.

Import Substitution Laws Backfire on Brazil

Although import substitution laws have been used by developing nations in their industrialization efforts, they sometimes backfire. Let us consider the example of Brazil.

In 1991, Enrico Misasi was the president of the Brazilian unit of Italian computer maker Olivetti Inc., but he did not have an Olivetti computer. The computer on his desk was instead manufactured by two Brazilian firms; it cost three times more than an Olivetti and its quality was inferior. Rather than manufacturing computers in Brazil, Olivetti, Inc. was permitted to manufacture only typewriters and calculators.

This anomaly was the result of import substitution policies practiced by Brazil until 1991. From the 1970s until 1991, importing a foreign personal computer—or a microchip, a fax, or dozens of other electronic goods—was prohibited. Not only were electronic imports prohibited, but foreign firms willing to invest in Brazilian manufacturing plants were also banned. Joint ventures were deterred by a law that kept foreign partners from owning more than 30 percent of a local business. These restrictions were intended to foster a homegrown electronics industry. Instead, even the law's proponents came to admit that the Brazilian electronics industry was uncompetitive and technologically outdated.

The costs of the import ban were clearly apparent by the early 1990s. Almost no Brazilian automobiles were equipped with electronic fuel injection or antiskid brake systems, both widespread throughout the world. Products such as Apple's Macintosh computer were not permitted to be sold in Brazil. Brazil chose to allow Texas Instruments to shut down its Brazilian semiconductor plant, resulting in a loss of 250 jobs, rather than permit Texas Instruments to invest \$133 million to modernize its product line. By adhering to its import substitution policy, Brazil wound up a largely computer-unfriendly nation: By 1991, only 12 percent of small- and medium-sized Brazilian companies were at least partially computerized, and only 0.5 percent of Brazil's classrooms were equipped with computers. Many Brazilian companies postponed modernization because computers available overseas were not manufactured in Brazil and could not be imported. Some Brazilian companies resorted to smuggling computers and other electrical equipment; those companies that adhered to the rules wound up with outdated and overpriced equipment.

Realizing that the import substitution policy had backfired on its computer industry, in 1991, the Brazilian government scrapped a cornerstone of its nationalistic approach by lifting the electronics import ban—though continuing to protect domestic industry with high import duties. The government also permitted foreign joint venture partners to raise their ownership shares from 30 to 49 percent and to transfer technology into the Brazilian economy.

Export-Led Growth

Another development strategy is **export-led growth**, or **export-oriented policy**. This strategy is outward oriented because it links the domestic economy to the world economy. Instead of pursuing growth through the protection of domestic industries suffering comparative disadvantage, the strategy involves promoting growth through the export of manufactured goods. Trade controls are either nonexistent or low, in the sense that any disincentives to export resulting from import barriers are counterbalanced by export subsidies. Industrialization is viewed as a natural outcome of development instead of being an objective pursued at the expense of the economy's efficiency. By the mid-1980s, many developing nations were abandoning their import substitution strategies and shifting their emphasis to export-led growth.

Export-oriented policies have three advantages: They encourage industries in which developing nations are likely to have a comparative advantage, such as labor-intensive manufactured goods; by providing a larger market in which to sell, they allow domestic

manufacturers greater scope for exploiting economies of scale; and by maintaining low restrictions on imported goods, they impose a competitive discipline on domestic firms that forces them to increase efficiency.

Economists at the World Bank have investigated the relation between openness to international trade and economic growth for developing nations. They divided a sample of 72 nations into “globalizers” and “nonglobalizers.” The globalizers are defined as the 24 nations that achieved the largest increases in their ratio of trade to gross domestic product from 1975 to 1995. During the 1960s and 1970s, the nonglobalizers experienced somewhat faster growth of real income per capita on average than the globalizers. However, during the 1980s, globalizers experienced much higher growth rates; real income per capita grew an average of 3.5 percent a year in these nations, compared with 0.8 percent for the nonglobalizers. These findings support the concept that the economic performance of nations implementing export-led growth policies has been superior to that of nations using import substitution policies.⁶

Is Economic Growth Good for the Poor?

Although the evidence strongly suggests that trade is good for growth, is growth good for poor workers in developing nations? Critics argue that growth tends to be bad for the poor if the growth in question has been promoted by trade or foreign investment. Investment inflows, they say, make economies less stable, exposing workers to the risk of financial crisis and to the attentions of advanced nation banks. Moreover, they contend that growth driven by trade provides Western multinational corporations a dominant role in third-world development. That is bad, because Western multinationals are not interested in development at all, only in making larger profits by ensuring that the poor stay poor. The proof of this, say critics, lies in the evidence that economic inequality increases even as developing nations and advanced nations increase their national income, and in the multinationals’ use of sweatshops when producing goods. So if workers’ welfare is your primary concern, the fact that trade promotes growth, even if true, misses the point.

However, there is strong evidence that growth does aid the poor. Developing nations that have achieved continuing growth, as in East Asia, have made significant progress in decreasing poverty. The nations in which widespread poverty persists, or is worsening, are those in which growth is weakest, notably in Africa. Although economic policy can affect the extent of poverty, in the long run, growth is much more important.

There is intense debate over the extent to which the poor benefit from economic growth. Critics argue that the potential benefits of economic growth for the poor are undermined or even offset entirely by sharp increases in inequality that accompany growth. On the other hand, proponents contend that liberal economic policies such as open markets and monetary and fiscal stability raise the incomes of the poor and everyone else in society proportionately.

Suppose it were true that income inequality is increasing between the advanced and developing nations. Would this be a terrible indictment of globalization? Perhaps not. It would be disturbing if inequality throughout the world were increasing because incomes of the poorest were decreasing in absolute terms, instead of in relative terms. However, this is rare. Even in Africa, which is behaving poorly in relative terms, incomes have been increasing and broader indicators of development have been improving. Perhaps it is too little, but something is better than nothing.

⁶David Dollar and Aart Kraay, *Trade, Growth, and Poverty*, World Bank Development Research Group, 2001.

Can All Developing Nations Achieve Export-Led Growth?

Although exporting can promote growth for developing economies, it depends on the willingness and ability of advanced nations to go on absorbing large amounts of goods from developing nations. Pessimists argue that this process involves a fallacy of composition. If all developing nations tried to export simultaneously, the price of their exports would be driven down on world markets. Moreover, advanced nations may become apprehensive of foreign competition, especially during eras of high unemployment, and impose tariffs to reduce competition from imports. Will liberalizing trade be self-defeating if too many developing nations try to export simultaneously?

Although developing nations as a group are enormous in terms of geography and population, in economic terms, they are small. Taken together, the exports of all the world's poor and middle-income nations equal only 5 percent of world output. This is an amount approximately equivalent to the national output of the United Kingdom. Even if growth in the global demand for imports were somehow capped, a concerted export drive by those parts of the developing world not already engaged in the effort would put no great strain on the global trading system.

Pessimists also tend to underestimate the scope for intra-industry specialization in trade, which gives developing nations a further set of new trade opportunities. The same goes for new trade among developing nations, as opposed to trade with the advanced nations. Often, as developing nations grow, they move away from labor-intensive manufactures to more sophisticated kinds of production. This movement makes room in the markets they previously served for goods from nations that are not yet so advanced. In the 1970s, Japan withdrew from labor-intensive manufacturing, making way for exports from South Korea, Taiwan, and Singapore. In the 1980s and 1990s, South Korea, Taiwan, and Singapore did the same, as China began moving into those markets. As developing nations grow through exporting, their own demand for imports rises.

East Asian Economies

Despite the sluggish economic performance of many developing nations, some have realized sustained economic growth, as shown in Table 7.4. One group of successful developing nations has come from East Asia, namely China and Indonesia. What accounts for their success?

TABLE 7.4

East Asian Economies' Growth Rates of Gross Domestic Product, 2012–2015

Nation	ANNUAL GROWTH RATE		
	2012	2013	2015
China	7.7%	7.7%	6.9%
Cambodia	7.3	7.4	7.0
Philippines	6.8	7.2	5.9
Indonesia	6.3	5.8	4.8
Thailand	6.5	2.9	2.8
Vietnam	5.2	5.4	6.7
Malaysia	5.6	4.7	5.0

Source: The World Bank, *World Data Bank*, *World Development Indicators*, available at www.databank.worldbank.org. See also Central Intelligence Agency, *World Fact Book*, available at www.cia.gov.

The East Asian nations are highly diverse in natural resources, populations, cultures, and economic policies. They have in common several characteristics underlying their economic success: (1) high rates of investment and (2) high and increasing endowments of human capital because of universal primary and secondary education.

To foster competitiveness, East Asian governments have invested in their people and provided a favorable competitive climate for private enterprise. They have also kept their economies open to international trade. The East Asian economies have actively sought foreign technology, such as licenses, capital goods imports, and foreign training.

The East Asian economies have generally discouraged the organization of trade unions—whether by deliberate suppression (South Korea and Taiwan), by government paternalism (Singapore), or by a laissez-faire policy (Hong Kong). The outcome has been the prevention of minimum wage legislation and the maintenance of free and competitive labor markets.

In the post–World War II era, trade policies in the East Asian economies (except Hong Kong) began with a period of import substitution. To develop their consumer goods industries, these nations levied high tariffs and quantitative restrictions on imported goods. They also subsidized some manufacturing industries such as textiles. Although these policies initially led to increased domestic production, as time passed, they inflicted costs on the East Asian economies. Because import substitution policies encouraged the importing of capital and intermediate goods and discouraged the exporting of manufactured goods, they led to large trade deficits for the East Asian economies. To obtain the foreign exchange necessary to finance these deficits, the East Asian economies shifted to a strategy of outward orientation and export promotion.

Export push strategies were enacted in the East Asian economies by the late 1950s and 1960s. Singapore and Hong Kong set up trade regimes that were close to free trade. Japan, South Korea, and Taiwan initiated policies to promote exports while protecting domestic producers from import competition. Indonesia, Malaysia, and Thailand adopted a variety of policies to encourage exports while gradually reducing import restrictions. These measures contributed to an increase in the East Asian economies' share of world exports, with manufactured exports accounting for most of this growth.

The success of the East Asian economies has created problems, however. The industrialize-at-all-costs emphasis has left many of the East Asian economies with major pollution problems. Whopping trade surpluses have triggered a growing wave of protectionist sentiment overseas, especially in the United States, which sees the East Asian economies depending heavily on the U.S. market for future export growth.

Flying Geese Pattern of Growth

It is widely recognized that East Asian economies have followed a **flying geese pattern of economic growth** in which nations gradually move up in technological development by following in the pattern of nations ahead of them in the development process. Taiwan and Malaysia take over leadership in apparel and textiles from Japan as Japan moves into the higher-technology sectors of automotive, electronic, and other capital goods. A decade or so later, Taiwan and Malaysia are able to upgrade to automotive and electronics products, while the apparel and textile industries move to Thailand, Vietnam, and Indonesia.

To some degree, the flying geese pattern is a result of market forces: Labor-abundant nations will become globally competitive in labor-intensive industries, such as footwear, and will graduate to more capital- or skill-intensive industries as savings and education deepen the availability of capital and skilled workers. However, as the East Asian economies have demonstrated, more than just markets are necessary for flying geese development. Even basic labor-intensive products, such as electronics assembly, are increasingly determined by multinational enterprises and technologies created in advanced nations.

For East Asian economies, a strong export platform has underlain their flying geese pattern of development. East Asian governments have utilized several versions of an export platform, such as bonded warehouses, free trade zones, joint ventures, and strategic alliances with multinational enterprises. Governments supported these mechanisms with economic policies that aided the incentives for labor-intensive exports.⁷

INTERNATIONAL TRADE APPLICATION

Is State Capitalism Winning?

From the 1980s to 2008, the discussion of the pros and cons of state-directed capitalism versus free market capitalism appeared to be resolved. The robust performance of the U.S. economy, underlain by deregulation, globalization, and free trade in conjunction with the breakup of the Soviet Union and China's embracing capitalism, affirmed the limitations of state-run economies. Free market capitalism was generally viewed to work better.

However, the Great Recession of 2008–2009 reopened the discussion about the role of government in the economy. The severity of this economic downturn exposed the shortcomings of the advanced economies and resulted in many observers wondering whether the market capitalism model had crumbled. In the United States, Democrats wanted an activist government to create jobs and foster new industries, like wind power, to help America compete in the global economy. At the same time, Republicans wanted a smaller government to promote economic revitalization.

Government aid for economic development has tended to involve less controversy for developing countries. Countries such as Brazil, Malaysia, China, and Russia have favored “state capitalism” that integrates the powers of the state with the powers of capitalism. Under this system, governments create state-owned businesses to manage the development of factors of production that they deem to be of critical importance to the state and to create large numbers of jobs. Examples of state-owned businesses include communications firms in China, oil firms in Malaysia, and natural gas firms in Russia. Governments influence bank-lending policies, own essential sectors of the economy, and freely steer the economy through bureaucratic decision making. Although state



capitalism is a type of capitalism, it is one in which government behaves as the major economic player. The ability of state capitalistic nations like China to achieve robust economic growth during the Great Recession has caused observers to ponder if this economic system can achieve better economic results than the freer market model of the United States.

The importance of state capitalism is notable. In China, the government is the largest shareholder of the country's largest businesses. Also, state companies account for about 80 percent of the value of the stock market in China, 6 percent in Russia, and 40 percent in Brazil. The 13 largest oil firms that control three-fourths of the world's oil reserves are all government backed. So is Russia's Gazprom, the world's largest extractor of natural gas.

Although state capitalism is an alternative to market capitalism, it has its limitations. State giants utilize capital and talent that might have been used better by private companies. Also, although state firms have sometimes succeeded in imitating others, partly because they can use the government's influence to obtain access to technology, they often have been less successful in promoting new technological innovations. Finally, state capitalism operates well only when run by competent government officials, which sometimes does not occur. This economic system can result in inequality, favoritism, and discontent, as seen in Egypt and Russia.

So who is on the right side, state capitalism or free market capitalism? History shows that every economic miracle eventually loses its luster as youthful exuberance gives way to economic maturity. As countries progress from agriculture and crafts to manufacturing and then to a service and knowledge economy, what rises comes down

(continued)

⁷Terutomo Ozawa, *Institutions, Industrial Upgrading, and Economic Performance in Japan: The Flying-Geese Theory of Catch-Up Growth* (Cheltenham, United Kingdom: Edward Elgar, 2005).

and levels out. During this evolution, the countryside empties out and no longer provides a seemingly infinite supply of cheap labor. Also, as fixed investment increases, its marginal return decreases, and each additional unit of capital fosters less output than the preceding one. This is one of the oldest principles in economics—the law of diminishing returns. The future success of state capitalism, as a model for economic development, remains an open question.

What do you think? Should we have state capitalism or free market capitalism? Why?

Sources: Josef Joffe, “China’s Coming Economic Slowdown,” *The Wall Street Journal*, October 26, 2013; James McGregor, *No Ancient Wisdom, No Followers: The Challenges of Chinese Authoritarian Capitalism* (Westport, CT: Prospectus Press, 2012); “State Capitalism,” *The Economist*, January 21, 2012; Michael Schuman, “State Capitalism versus the Free Market,” *Time Business*, September 30, 2011 at <http://business.time.com>; and Ian Bremmer, “State Capitalism Comes of Age,” *Foreign Affairs*, May–June 2009.

China’s Great Leap Forward

China is another East Asian country that has had remarkable economic success in recent years. Let us see why.

In the early 1970s, the People’s Republic of China was an insignificant participant in the world market for goods and financial services. By 2005, China had grown to be the world’s second largest economy, with a national output over half that of the United States and 60 percent larger than Japan’s. What caused this transformation?

Modern China began in 1949, when a revolutionary communist movement captured control of the nation. Soon after the communist takeover, China instituted a Soviet model of central planning and import substitution with emphasis on rapid economic growth, particularly industrial growth. The state took over urban manufacturing, collectivized agriculture, eliminated household farming, and established compulsory production quotas. By discouraging the ability of markets to function, China’s government stifled economic growth and left many of its people poor.

By the 1970s, China could see its once poor neighbors—Japan, Singapore, Taiwan, and South Korea—enjoying extraordinary growth and prosperity. This led to China’s marketizing its economy through small, step-by-step changes to minimize economic disruption and political opposition. In agriculture and industry, reforms were made to increase the role of the producing unit, to increase individual incentives, and to reduce the role of state planners. Many goods were sold for market-determined—not state-controlled—prices. Greater competition was allowed both between new firms and between new firms and state firms. Moreover, China opened its economy to foreign investment and joint ventures. The Chinese government’s monopoly over foreign trade was also disbanded; in its place, economic zones were established in which firms could keep foreign exchange earnings and hire and fire workers. China has broken with the path of import substitution, where import barriers are established for the development of domestic industry. China is now remarkably open to international trade, and imports play a large role in the Chinese economy.

Although China has dismantled much of its centrally planned economy, political freedoms have lagged behind. Recall the Chinese government’s use of military force to end a pro-democracy demonstration in Beijing’s Tiananmen Square in 1989 that led to loss of life and demonstrated the Communist Party’s determination to maintain its political power. Under Communist Party rule, there is no freedom of speech, making independent voices all but inaudible. China’s evolution toward capitalism has thus consisted of expanded use of market forces under a communist political system. Today, China describes itself as a *socialist market economy*.

Concerning international trade, China has followed a pattern consistent with the principle of comparative advantage as explained by the factor endowment theory discussed in

Chapter 3. China's exports have emphasized the intensive use of labor, its abundant resource. Therefore, China has become a center of low-wage manufacturing and exports sporting goods, toys, electronics, footwear, garments, textiles, and other goods. On the import side, China is a growing market for machinery, transportation equipment, and other capital goods that require higher levels of technologies than China can produce domestically. Most of China's economic expansion since 1978 has been driven by rapid growth in exports that embody labor as the main input and investments in infrastructure.

Challenges and Concerns for China's Economy

Despite China's leap forward, it still faces many obstacles if it is to surpass middle-level income status and become a rich nation. Let us briefly consider some challenges and concerns for the Chinese economy.⁸

Privatization of Industry No country in the modern world has attained continuing economic growth without significant reliance on private enterprise and decentralized private markets. China's economy still has an abundance of state-owned enterprises with excessive employment and low productivity. Although their significance has decreased over time, they still account for about half of nonagricultural output. An example is the state-controlled banking sector that makes loans to other large, inefficient, and unprofitable state companies. China's economy is also plagued with a vast array of price controls, restrictions on domestic labor migration, and other impediments to economic reforms necessary for sustained economic development. If China desires to continue to grow rapidly, it will have to decrease the presence of the state-owned enterprises and substantially enlarge the private sector in telecommunications, finance, and many other fields.

Rising Labor Costs A dwindling supply of inexpensive labor provides another challenge for China. China's one-child policy has resulted in youth becoming in short supply, and the remainder of the population is aging. Thus, China's workforce will start shrinking in a few years' time. Also, migration restrictions hinder workers from moving from farms to coastal cities where factories are located. As wages increase in China as the supply of workers diminishes, then the prices of its exports will rise, absent a proportional increase in labor productivity. The higher prices of exports from China should decrease the incentive of foreign consumers to purchase low-end goods such as textiles and toys from China. China will have to emphasize other sources of growth than an endless supply of cheap labor.

China still has cheap labor in its interior, away from its developed coastal cities. Although moving manufacturing operations inland means lower wages, it also means higher transportation costs on China's crowded highways and railroads. Also, locating factories in China's hinterland places them in a better position to service China's growing domestic consumer market rather than exporting to consumers in the United States and elsewhere.

Faced with increasing wages within China, some companies are shifting production elsewhere to hold costs down. Yue Yuen Industrial Ltd., the world's largest shoe maker, has moved some of its manufacturing of low-cost shoes from China to countries such as Cambodia and Bangladesh. As factories relocate to other countries, local wages will increase faster than they did in China because their labor becomes scarcer. Also, because no other country can duplicate the massive scale of China, logistics will become an increasing

⁸"China's Next Chapter," *McKinsey Quarterly*, Number 3, 2013; and Wayne Morrison, *China-U.S. Trade Issues*, Congressional Research Service, Library of Congress, December 5, 2014.

portion of costs as companies must divide their manufacturing over several countries. This will make things more costly, which means that the West will have to adopt new consumption trends.

Development of Infrastructure The development of infrastructure remains a major objective of the Chinese government, which has long recognized that a modern economy operates on reliable telecommunications, rails and roads, and electricity. China's goal is to raise the country's infrastructure to the level of infrastructure of middle-income countries while using increasingly efficient transportation systems to link the country together. This will require China to make large additional investments in airports, expressways, port facilities, and rail track. To a large extent, funding for these projects will come from the Chinese government, which supplies more than 90 percent of infrastructure financing.

One aspect of China's infrastructure policy concerns long-distance trucking, which accounts for about three-fourths of domestic freight shipments by volume. However, the trucking industry is fragmented and inefficient, especially in the country's interior regions where manufacturing and consumption are expanding substantially as companies move inland for cheaper labor and land. Although China is building roads in its interior regions at a rapid pace, the task is difficult given formidable terrain. Also, many new highways become congested almost as soon as they are constructed, and long transportation delays are common.

Reliance on Investment Spending Another challenge for China concerns the over-reliance on investment and the under-reliance on consumption. Chinese officials know that a rebalancing is needed because the substantial increases in investment that have fueled China's robust economic growth for the past three decades are not sustainable. Also, China's consumers cannot provide additional demand unless wealth is redistributed toward them. Household consumption accounts for only about 38 percent of China's gross domestic product, while it accounts for about 70 percent of the U.S. gross domestic product. Stated differently, consumers are not picking up the Chinese economy's slack as they must if they are to fuel economic growth now that the country's investment-oriented model is reaching its limits.

As Chinese officials acknowledge, the main objective of economic policy adjustment is to shift the country from a production (investment)-oriented economy to one emphasizing household consumption. The government might increase the dividend pay-outs of state-owned enterprises in order to increase the incomes and consumption of Chinese households. However, increasing the income of households at the expense of state-owned enterprises is politically challenging, as powerful vested interest groups resist change. A rebalancing will significantly decrease the growth of aggregate spending on heavy manufacturing, construction, and other sectors that have historically benefitted from China's huge increase in investment. At the writing of this text, it remains to be seen the extent to which the Chinese government can rebalance its economy.

Environmental Future Anyone who has traveled to China recently has likely experienced serious air pollution in its major cities. The air quality index in Beijing frequently exceeds a 500 threshold, while any rating above 300 means the air is unsafe to breathe. This means that children in Beijing inhale the equivalent of two packs of cigarettes a day just by breathing. Although manufacturing industries and Beijing's 5 million cars contribute to the city's crippling air pollution, most experts mainly blame the coal-burning electrical plants that power China's economic growth. China now burns almost half of the world's coal, roughly equal to the amount used by all other countries of the world combined, and Beijing is surrounded by a vast array of coal-burning power plants.

With its surging economy, China has depleted its own natural resources and is now draining resources from other countries as well. China's insatiable demand for wood has already deforested much of the country, resulting in land erosion and flooding. By 2020, according to forecasts, 25 percent of China's arable land will be gone and the country's water needs, waste water, and sulfur dioxide emissions will rise dramatically.

Although Chinese officials are aware of the problem, their response has been inadequate, largely because the demands of continuing economic growth supersede environmental considerations. In the future, China will need to seize the opportunity to make its industries more environmentally sound and economic growth more sustainable.

Status in Global Finance As the world's largest saver, China has a major role to play in global financial markets. However, as a traditionally closed economy, China cannot open its doors overnight. To become a leading nation in global finance, China's domestic financial markets must deepen and further develop, and returns earned by households, corporations, and the government must increase if the country is to attract and deploy capital more effectively. The barriers that prevent individuals and companies from investing more freely outside of China's borders and the barriers that prevent foreign investors from investing within China will have to decline. China will have to build additional trust of global investors. Continued reform in China, coupled with its vast domestic savings and outsized role in world trade, could make the country an influential supplier of capital in the years ahead.

Convertibility of the Yuan As China's economic and financial influence increase, so will the use of its currency, the *yuan*, also called the *renminbi*. China wishes to make the yuan an international currency that might rival the U.S. dollar and the euro in global markets. Achieving this result will require China to develop deep and liquid capital markets for yuan-denominated financial assets, such as corporate bonds. Also, the yuan needs to become an international medium of exchange for financing transactions. This means that the yuan needs to be fully convertible, whereby an individual or business firm can convert it into foreign currencies for any reason and at any foreign exchange dealer or bank. Indeed, China's pursuit of financial globalization will require time and patience.

China's Currency Policy A cornerstone of China's economic policy has been managing the yuan's exchange rate to benefit its exporters. China does not have a floating exchange rate that is determined by market forces, as is the case with most advanced economies such as the United States. Rather, it has generally pegged the yuan to the U.S. dollar; that is, the People's Bank of China determines the yuan's reference rate against the dollar and allows the yuan to fluctuate within a fixed band on either side of the reference rate.

Although it is difficult to determine the true value of the yuan, most studies over the years have concluded that the currency has been substantially undervalued against the dollar. By keeping the yuan at artificially low levels, China makes its exports more competitive in the global marketplace. This has resulted in members of the U.S. Congress trying to get the U.S. Treasury to declare that China is a "currency manipulator" or by introducing bills in Congress that are intended to force China to revalue its yuan. This topic is further discussed in Chapter 15 of this textbook.

Industrial Policy and Innovation Although a sizable portion of China's economy is driven by market forces, the Chinese government continues to play a large role in economic decision making. For example, the government enacts policies that encourage households to save a large amount of their income, much of which is deposited in state-controlled banks. This allows the government to provide low-cost financing to Chinese companies.

Also, the government maintains industrial policies that foster the development of industries that are considered essential to the country's future economic development. These policies include subsidies, tax breaks, preferential loans, trade barriers, export restrictions on raw materials, technology transfer requirements imposed on foreign firms, government procurement regulations that provide preferences for Chinese firms, and the like.

Many of China's recent industrial policies have the goal of modernizing the structure of China's economy from a global center of low-tech manufacturing to a global center of innovation and technological leadership. Priority areas for increased government-sponsored research and development include space programs, aerospace development and manufacturing, renewable energy, computer science, and life sciences. Some U.S. companies have expressed concerns that China's industrial policies harm their businesses. However, China's government contends that its industrial policies do not discriminate against foreign firms or violate global trade rules.

High-speed rail is a prime example of the Chinese government's ability to identify priority industries and channel money and policy tools to foster them. China's long-distance bullet train, which speeds between Beijing and Shanghai at 217 miles per hour, is supported by state funds for research, land for tracks, subsidies for equipment producers, and incentives for foreign companies to share commercial secrets. For example, China's government pressured foreign engineering companies such as Germany's Siemens and Japan's Kawasaki to share their technical knowledge in exchange for lucrative contracts.

Intellectual Property Rights Concerns American businesses have expressed concerns over economic losses suffered by them due to intellectual property infringement in China, and elsewhere, including those that have resulted from cyberattacks. However, the Chinese government maintains that it has substantially improved its protection of intellectual property, but the country lacks the resources and sophisticated legal system to effectively address the violations. Yet some observers argue that China's relatively poor record on intellectual property rights enforcement is the result of the government's desire to make China a major producer of high-technology and capital-intensive products. Therefore, the government is tolerant of intellectual property rights piracy if it helps Chinese companies to become more technologically advanced and thus gain a competitive advantage.

China's Holdings of U.S. Securities China's holdings of U.S. securities have become substantial, including U.S. Treasury securities, U.S. government agency (such as Fannie Mae and Freddie Mac) securities, corporate bonds, and stock. These security holdings are largely the result of the trade surplus that China runs against the United States. When Chinese exporters sell their goods to the United States, they are generally paid in dollars. China's government requires these exporters to turn over their dollars in exchange for China's currency, the yuan. This allows China's government to accumulate a substantial amount of dollars. Instead of holding onto dollars, which earn no interest, the Chinese government invests in U.S. Treasury securities because they are viewed as a relatively safe investment.

Although this helps the U.S. government to finance its budget deficit, some analysts contend that China's large holdings of U.S. securities could provide China leverage over America's foreign policy. They maintain that China might attempt to sell, or threaten to sell, a large portion of its U.S. securities as punishment over a policy conflict, which could harm the U.S. economy. However, others contend that China's holdings of U.S. debt securities provide it with little leverage over America. They note that, given China's dependency on a stable and growing American economy, and its sizable holding of U.S. securities, any attempt to sell a large share of those holdings would likely damage both the U.S. and Chinese

economies. Such a move could also cause the U.S. dollar to lose value (depreciate) against the world's currencies, which could decrease the value of China's remaining holdings of U.S. dollar assets.

China's Export Boom Comes at a Cost: How to Make Factories Play Fair

Although China has become a major exporter of manufactured goods, it has come at a cost. As retailers such as Walmart and The Home Depot place pressure on Chinese suppliers to produce cheap goods at the lowest possible costs, concerns about product safety, the quality of the environment, and labor protections are brushed aside.

In 2007, Chinese firms were challenged by consumer advocates on the grounds that they were producing unsafe toys, cribs, electronic products, and the like. Mattel, the world's largest toymaker, issued three separate recalls for toys manufactured in China that contained hazardous lead paint and dangerous magnets; Disney recalled thousands of Baby Einstein blocks; smaller companies recalled everything from children's jewelry, key chains, and notebooks to water bottles and flashlights. The biggest disappointment to children was the double recall of Thomas the Tank Engine toys when it was discovered that they contained unsafe levels of lead in the paint, which can cause brain damage to children. Moreover, the Floating Eyeballs toy was recalled after it was found to be filled with kerosene. Critics maintained that these examples are part of a larger pattern. The U.S. economy has gone global and has outsourced more production to nations like China. At the same time, the U.S. government has cut back import regulation and inspection. As a result, American consumers are exposed to increasing numbers of products that are neither produced in the United States nor subject to American safety standards.

Protecting labor is another problem for China. U.S. retailers such as Eddie Bauer and Target continually demand lower prices from their Chinese suppliers, allowing American consumers to enjoy inexpensive clothes and sneakers. Price pressure creates a powerful incentive for Chinese firms to cheat on labor standards that American companies promote as a badge of responsible capitalism. These standards generally incorporate the official minimum wage of China, which is set by local or provincial governments and ranges from \$45 to \$101 a month. U.S. companies typically say they adhere to the government-mandated workweek of 40 to 44 hours, beyond which higher overtime pay is required. The pressure to cut costs has resulted in many Chinese factories ignoring these standards. By falsifying payrolls and time sheets, they have been able to underpay their workers and force them to work excessive hours at factories that often have health and safety problems. Conceding that the current system of auditing Chinese suppliers is failing to stop labor abuses, U.S. retailers are searching for ways to improve China's labor protections. It remains to be seen if these efforts will be successful.

Promoting a safe environment is another problem for China. In the last two decades since U.S. firms began turning to Chinese factories to churn out cheap T-shirts and jeans, China's air, land, and water have paid a heavy price. Environmental activists and the Chinese government note the role that U.S. multinational companies play in China's growing pollution problems by demanding ever lower prices for Chinese products. One way China's factories have historically kept costs down is by dumping waste water directly into rivers. Treating contaminated water costs more than \$0.13 a metric ton, so large factories can save hundreds of thousands of dollars a year by sending waste water directly into rivers in violation of China's water pollution laws. The result is that prices in the United States are artificially low because Americans are not paying the costs of pollution. American companies that use Chinese products are subject to much criticism for not taking a hard enough line against polluting suppliers in China.

India: Breaking Out of the Third World

India is another example of an economy that has improved its economic performance following the adoption of freer trade policies. The economy of India is diverse, encompassing agriculture, handicrafts, manufacturing, and a multitude of services. Although two-thirds of the Indian workforce still earn their livelihood directly or indirectly through agriculture, services are a growing sector of India's economy. The advent of the digital age and the large number of young and educated Indians fluent in English are transforming India as an important destination for global outsourcing of customer services and technical support.

India and China have traveled different paths of development. China has followed the traditional development route of nations like Japan and South Korea, becoming a center for low-wage manufacturing of goods. Realizing that it could not go head to head with China in manufacturing, India concluded that it had a better chance in exporting services. Consistent with the Heckscher–Ohlin theory, India's abundant factor has been the relatively well-educated, English-speaking labor that provides a low-cost gateway to global services such as data processing operations, call centers, and the like. Although economic growth rates give China's goods-dominated strategy the superior track record so far, India's approach may pay off better over the long run. A look at per capita incomes around the world indicates that the wealth of nations eventually depends more on services than industry.

After gaining independence from Britain in 1947, India began practicing socialism and adopted an import substitution model to run its economy. Both of these resulted from India's fear of imperialism of any kind following its independence. Therefore, India's government initiated protectionist trade barriers and bans on foreign investment to restrict competition, strict regulations over private business and financial markets, a large public sector, and central planning. This resulted in India becoming isolated from the mainstream world from the 1950s to the 1980s. During this period, India's economy achieved only a modest rate of growth and poverty was widespread. Increasingly, people in India recognized that public sector policy had failed India.

By 1991, policymakers in India realized that their system of state controls and import substitution was strangling the economy and that reforms were needed. The result was a clear switch toward an outward-oriented, market-based economy. The requirement that government must approve industrial investment expenditures was terminated, quotas on imports were abolished, export subsidies were eliminated, and import tariffs were slashed from an average of 87 percent in 1990 to 33 percent in 1994. Also, Indian companies were allowed to borrow on international markets, and the *rupee* was devalued. These reforms helped transform India from an agrarian, underdeveloped, and closed economy into a more open and progressive one that encourages foreign investment and draws more wealth from industry and services. The result has been a dramatic increase in economic growth and falling poverty rates.

India's outsourcing business illustrates how foreign investment and trade have benefitted the nation. The lifting of restrictions on foreign investment resulted in firms such as General Electric and British Airways moving information technology (IT) and other back office operations to India in the 1990s. The success of these companies showed the world that India was a viable destination for outsourcing, and additional companies set up operations in the nation. These multinationals trained thousands of Indian workers, many of whom transferred their skills to other emerging Indian firms. Indian workers benefitted from the thousands of jobs that were created and the rising incomes that resulted from foreign investment.

India's auto industry is another example of the benefits of trade and investment liberalization. Before the 1980s, prohibitions on foreign investment and high import tariffs shielded India's state-owned automakers from global competition. These firms used obsolete technology to produce just two models and sold them at high prices. By the 1990s, tariffs were slashed on auto imports and bans on foreign investment were largely phased out. The result was an increase in autos imported into India and also the entry of foreign automakers that established assembly plants in the nation. As competition increased, labor productivity increased more than threefold for Indian auto workers who benefitted from higher wages. Also, auto prices declined, unleashing a surge in consumer demand, a rise in auto sales, and the creation of thousands of auto worker jobs. Today, India's auto industry produces 13 times more cars than it did in the early 1980s, and India exports vehicles to other nations. None of this would have been possible had India's automakers remained isolated from the world.

However, the dynamic growth of India's outsourcing and automobile industries stands in contrast to most of its economy, where restrictions on trade and foreign investment stifle competition and foster the survival of inefficient firms. Food retailing illustrates how Indian industry gets along when foreign investment is prohibited. Labor productivity in this industry is only a fraction of the U.S. level. Much of this discrepancy is because almost all of India's food retailers are street markets and mom-and-pop counter stores rather than modern supermarkets. Moreover, the productivity of Indian supermarkets is much below the U.S. level as a result of their small scale and inefficient merchandising and marketing methods. In other developing nations, such as China and Mexico, global retailers such as Walmart have intensified competition, which has increased productivity. However, these retailers have been discouraged from investing in India.

Despite India's economic gains, the nation cannot afford to rest on its laurels; many Indians still live below the official poverty line. Sustaining robust economic growth will require the nation to focus on improving its infrastructure such as roads, electric power generation, rail freight, and ports. India's recent infrastructure investments have not kept pace with economic developments. In contrast, China has invested heavily to build a world-class infrastructure that can attract foreign investment and promote economic growth.

India is expected to become the world's most populous nation by 2030. This rate of population growth provides India the major advantage of an almost limitless labor supply and consumer demand. Nevertheless, it also illustrates the necessity of investing in education and health care and creating adequate opportunities for employment.

Most economists contend that India needs to systematically deregulate sectors such as retailing, the news media, and banking that have remained crippled by archaic policies. It also needs to eliminate preferences for small-scale, inefficient producers and repeal legislation blocking layoffs in medium- and large-sized firms. With deregulation and the opening of markets, vital foreign investments of capital and skills could flow more readily into India, making its industry more effective and the economy more robust. To ensure that India's economic growth reaches the whole nation, the government needs to reform its agriculture industry in order to generate jobs in rural areas.

India has made great progress, but further efforts will be needed to sustain its economic growth. With a rapidly rising population, India faces the challenge of creating millions of jobs to keep its people out of poverty. It remains to be seen whether India's government, private sector, and society at large will demonstrate the political will needed to work together and make this occur.

SUMMARY

1. Developing nations tend to be characterized by relatively low levels of gross domestic product per capita, shorter life expectancies, and lower levels of adult literacy. Many developing nations believe that the current international trading system, based on the principle of comparative advantage, is irrelevant for them.
2. Among the alleged problems facing the developing nations are (a) unstable export markets, (b) worsening terms of trade, and (c) limited market access.
3. Among the institutions and policies that have been created to support developing nations are the World Bank, the International Monetary Fund, and a generalized system of preferences.
4. International commodity agreements have been formed to stabilize the prices and revenues of producers of primary products. The methods used to attain this stability are buffer stocks, export controls, and multilateral contracts. In practice, these methods have yielded modest success.
5. The OPEC oil cartel was established in 1960 in reaction to the control that the major international oil companies exercised over the posted price of oil. OPEC has used production quotas to support prices and earnings above what could be achieved in more competitive conditions.
6. Besides seeking financial assistance from advanced nations, developing nations have promoted internal industrialization through policies of import substitution and export promotion. Nations emphasizing export promotion have tended to realize higher rates of economic growth than nations emphasizing import substitution policies.
7. The East Asian economies have realized remarkable economic growth in recent decades. The foundation of such growth has included high rates of investment, the increasing endowments of an educated workforce, and the use of export promotion policies.
8. By the 1990s, China had become a high-performing Asian economy. Although China has dismantled much of its centrally planned economy and permitted free enterprise to replace it, political freedoms have not increased. Today, China describes itself as a socialist market economy. Being heavily endowed with labor, China specializes in many labor-intensive products. In 2001, China became a member of the WTO.
9. India is another example of an economy that has rapidly improved its economic performance following the adoption of freer trade policies. After becoming independent from Britain in 1947, India began practicing socialism and adopted an import substitution policy to run its economy. By 1991, the policymakers of India realized that their system of state controls and import substitution was not working. Therefore, India adopted a more open economy that encourages foreign investment, and economic growth accelerated.

KEY CONCEPTS AND TERMS

Advanced nations (p. 239)
 Buffer stock (p. 250)
 Cartel (p. 253)
 Developing nations (p. 239)
 Export-led growth (p. 262)
 Export-oriented policy (p. 262)
 Flying geese pattern of economic growth (p. 265)

Generalized system of preferences (GSP) (p. 259)
 Import substitution (p. 261)
 International commodity agreements (ICAs) (p. 249)
 International Monetary Fund (IMF) (p. 258)
 Multilateral contracts (p. 251)

Organization of Petroleum Exporting Countries (OPEC) (p. 252)
 Primary products (p. 240)
 Production and export controls (p. 249)
 World Bank (p. 257)

STUDY QUESTIONS

1. What are the major reasons for the skepticism of many developing nations regarding the comparative-advantage principle and free trade?
2. Stabilizing commodity prices has been a major objective of many primary product nations. What are the major methods used to achieve price stabilization?
3. What are some examples of international commodity agreements? Why have many of them broken down over time?
4. Why are the developing nations concerned with commodity price stabilization?
5. The average person probably had never heard of the Organization of Petroleum Exporting Countries (OPEC) until 1973 or 1974 when oil prices skyrocketed. In fact, OPEC was founded in 1960. Why did OPEC not achieve worldwide prominence until the 1970s? What factors contributed to OPEC's problems in the 1980s?
6. Why is cheating a typical problem for cartels?
7. The generalized system of preferences is intended to help developing nations gain access to world markets. Explain.
8. How are import substitution and export promotion policies used to aid in the industrialization of developing nations?
9. Describe the strategy that East Asia used from the 1970s to the 1990s to achieve high rates of economic growth. Can the Asian miracle continue in the new millennium?
10. How has China achieved the status of a high-performing Asian economy? Why has China's normal trade relation status been a source of controversy in the United States? What are the likely effects of China's entry into the WTO?
11. What led India in the 1990s to abandon its system of import substitution, and what growth strategy did India adopt?

Regional Trading Arrangements



Since World War II, advanced nations have significantly lowered their trade restrictions. This trade liberalization has stemmed from two approaches. The first is a reciprocal reduction of trade barriers on a nondiscriminatory basis. Under the General Agreement on Tariffs and Trade (GATT) and its successor, the World Trade Organization (WTO), member nations acknowledge that tariff reductions agreed on by any two nations would be extended to all other members. Such an international approach encourages a gradual relaxation of tariffs throughout the world.

A second approach to trade liberalization occurs when a small group of nations, typically on a regional basis, form a **regional trading arrangement**. Under this system, member nations agree to impose lower barriers to trade within the group than to trade with nonmember nations. Each member nation continues to determine its domestic policies, but the trade policy of each includes preferential treatment for group members. Regional trading arrangements (free trade areas and customs unions) have been an exception to the principle of nondiscrimination embodied in the WTO. This chapter investigates the operation and effects of two regional trading arrangements, the European Union and the North American Free Trade Agreement.

Regional Integration versus Multilateralism

Recall that a major purpose of the WTO is to promote trade liberalization through worldwide agreements. However, getting a large number of countries to agree on reforms can be extremely difficult. By the early 2000s, the WTO was stumbling in its attempt to achieve a global trade agreement, and countries increasingly looked to narrow, regional agreements as an alternative. The number of regional trading agreements has risen from around 70 in 1990 to more than 300 today, and they cover more than half of international

trade. Are regional trading agreements building blocks or stumbling blocks to a multilateral trading system?¹

Trade liberalization under a regional trading arrangement is different from the multilateral liberalization embodied in the WTO. Under regional trading arrangements, nations reduce trade barriers only for a small group of partner nations, thus discriminating against the rest of the world. Under the WTO, trade liberalization by any one nation is extended to all WTO members, 164 nations, on a nondiscriminatory basis.

Although regional trading blocs can complement the multilateral trading system, by their very nature they are discriminatory and are a departure from the principle of normal trading relations, a cornerstone of the WTO system. Some analysts note regional trading blocs that decrease the discretion of member nations to pursue trade liberalization with outsiders are likely to become stumbling blocks to multilateralism. If Malaysia has already succeeded in finding a market in the United States, it would have only a limited interest in a free trade pact with the United States. But its less successful rival, Argentina, would be eager to sign a regional free trade agreement and thus capture Malaysia's share of the U.S. market: not by making a better or cheaper product, but by obtaining special treatment under U.S. trade law. Once Argentina obtains its special privilege, what incentive would it have to go to WTO meetings and sign a multilateral free trade agreement that would eliminate those special privileges?

Two other factors suggest that the members of a regional trading arrangement may not be greatly interested in worldwide liberalization. First, trade bloc members may not realize additional economies of scale from global trade liberalization that often provides only modest openings to foreign markets. Regional trade blocs that often provide more extensive trade liberalization may allow domestic firms sufficient production runs to exhaust scale economies. Second, trade bloc members may want to invest their time and energy in establishing strong regional linkages rather than investing them in global negotiations.

On the other hand, when structured according to principles of openness and inclusiveness, regional blocs can be building blocks rather than stumbling blocks to global free trade and investment. Regional blocs can foster global market openings in several ways. First, regional agreements may achieve deeper economic interdependence among members than do multilateral accords, because of the greater commonality of interests and the simpler negotiating processes. Second, a self-reinforcing process is set in place by the establishment of a regional free trade area: As the market encompassed by a free trade area enlarges, it becomes increasingly attractive for nonmembers to join to receive the same trade preferences as member nations. Third, regional liberalization encourages the partial adjustment of workers out of import-competing industries in which the nation's comparative disadvantage is strong and into exporting industries in which its comparative advantage is strong. As adjustment proceeds, the portion of the labor force that benefits from liberalized trade rises and the portion that loses falls; this process promotes political support for trade liberalization in a self-reinforcing process. For all of these reasons, when regional agreements are formed according to principles of openness, they may overlap and expand, promoting global free trade from the bottom up.

Let us next consider the various types of regional trading blocs and their economic effects.

¹World Trade Organization, "The WTO and Preferential Trade Agreements: From Co-existence to Coherence," *World Trade Report*, 2011.

Types of Regional Trading Arrangements

Since the mid-1950s, the term **economic integration** has become part of the vocabulary of economists. Economic integration is a process of eliminating restrictions on international trade, payments, and factor mobility. Economic integration results in the uniting of two or more national economies in a regional trading arrangement. Before proceeding, let us distinguish the types of regional trading arrangements.

A **free trade area** is an association of trading nations in which members agree to remove all tariff and nontariff barriers among themselves. Each member maintains its own set of trade restrictions against outsiders. An example of this stage of integration is the North American Free Trade Agreement (NAFTA), which consists of Canada, Mexico, and the United States. Beyond NAFTA, the United States has free trade agreements with many other countries, as seen in Table 8.1.

TABLE 8.1

U.S. Free Trade Agreements

Agreement	Date of Implementation	Agreement	Date of Implementation
Israel	1985	Morocco	2006
Canada	1989	CAFTA, DR**	2006
NAFTA*	1994	Oman	2009
Jordan	2001	Peru	2009
Chile	2004	South Korea	2012
Singapore	2004	Colombia	2012
Australia	2005	Panama	2012
Bahrain	2006		

*Members of the North American Free Trade Agreement (NAFTA) include Canada, Mexico, and the United States.

**Members of the Central American Free Trade Agreement (CAFTA) include Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and the United States. DR stands for Dominican Republic.

Source: U.S. Census Bureau, *Foreign Trade Statistics*, and World Trade Organization, *Regional Trade Agreements Information System*.

Like a free trade association, a **customs union** is an agreement among two or more trading partners to remove all tariff and nontariff trade barriers between themselves. In addition, each member nation imposes identical trade restrictions against nonparticipants. The effect of the common external trade policy is to permit free trade within the customs union, whereas all trade restrictions imposed against outsiders are equalized. A well-known example is **Benelux** (Belgium, the Netherlands, and Luxembourg), which was formed in 1948.

A **common market** is a group of trading nations that permits (1) the free movement of goods and services among member nations, (2) the initiation of common external trade restrictions against nonmembers, and (3) the free movement of factors of production across national borders within the economic bloc. The common market thus represents a more complete stage of integration than a free trade area or a customs union. The **European Union (EU)**² achieved the status of a common market in 1992.

²Founded in 1957, the European Community was a collective name for three organizations: the European Economic Community, the European Coal and Steel Community, and the European Atomic Energy Commission. In 1994, the European Community was replaced by the European Union following ratification of the Maastricht Treaty by the 12 member countries of the European Community. For simplicity, the name European Union is used throughout this chapter in discussing events that occurred before and after 1994.

Beyond these stages, economic integration could evolve to the stage of **economic union**, in which national, social, taxation, and fiscal policies are harmonized and administered by a supranational institution. Belgium and Luxembourg formed an economic union during the 1920s. The task of creating an economic union is much more ambitious than achieving the other forms of integration. This is because a free trade area, customs union, or common market results primarily from the abolition of existing trade barriers; an economic union requires an agreement to transfer economic sovereignty to a supranational authority. The ultimate degree of economic union would be the unification of national monetary policies and the acceptance of a common currency administered by a supranational monetary authority. The economic union would thus include the dimension of a **monetary union**.

The United States serves as an example of a monetary union. Fifty states are linked together in a complete monetary union with a common currency, implying completely fixed exchange rates among the 50 states. The Federal Reserve serves as the single central bank for the nation; it issues currency and conducts the nation's monetary policy. Trade is free among the states, and both labor and capital move freely in pursuit of maximum returns. The federal government conducts the nation's fiscal policy and deals in matters concerning retirement and health programs, national defense, international affairs, and the like. Other programs, such as police protection and education, are conducted by state and local governments so that states can keep their identity within the union.

Impetus for Regionalism

Regional trading arrangements are pursued for a variety of reasons. A motivation of virtually every regional trading arrangement has been the prospect of enhanced economic growth. An expanded regional market can allow economies of large-scale production, foster specialization, enhance learning-by-doing, and attract foreign investment. Regional initiatives can also foster a variety of noneconomic objectives such as managing immigration flows and promoting regional security. Regionalism may enhance and solidify domestic economic reforms. East European nations have viewed their regional initiatives with the European Union as a means of locking in their domestic policy shifts toward privatization and market-oriented reform.

Smaller nations may seek safe haven trading arrangements with larger nations when future access to the larger nations' markets appears uncertain. This kind of access was an apparent motivation for the formation of NAFTA. In North America, Mexico was motivated to join NAFTA partially by fear of changes in U.S. trade policy toward a more managed or strategic trade orientation. Canada's pursuit of a free trade agreement was significantly motivated by a desire to discipline the use of countervailing and antidumping duties by the United States.

As new regional trading arrangements are formed or existing ones are expanded or deepened, the opportunity cost of remaining outside an arrangement increases. Non-member exporters could realize costly decreases in market share if their sales are diverted to companies of the member nations. This prospect may be sufficient to tip the political balance in favor of becoming a member of a regional trading arrangement, as exporting interests of a nonmember nation outweigh its import-competing interests. The negotiations between the United States and Mexico to form a free trade area appear to have strongly influenced Canada's decision to join NAFTA, and not be left behind in the movement toward free trade in North America.

Effects of a Regional Trading Arrangement

What are the possible welfare implications of *regional trading arrangements*? We can delineate the theoretical benefits and costs of such devices from two perspectives. First are the **static effects of economic integration** on productive efficiency and consumer welfare. Second are the **dynamic effects of economic integration** that relate to member nations' long-run rates of growth. Because a small change in the growth rate can lead to a substantial cumulative effect on national output, the dynamic effects of trade policy changes can yield substantially larger magnitudes than those based on static models. Combined, these static and dynamic effects determine the overall welfare gains or losses associated with the formation of a regional trading arrangement.

Static Effects

The static welfare effects of lowering tariff barriers among members of a trade bloc are illustrated in the following example. Assume a world composed of three countries: Luxembourg, Germany, and the United States. Consider Luxembourg and Germany decide to form a customs union, and the United States is a nonmember. The decision to form a customs union requires that Luxembourg and Germany abolish all tariff restrictions between themselves while maintaining a common tariff policy against the United States.

Referring to Figure 8.1, assume the supply and demand schedules of Luxembourg to be S_L and D_L . Assume also that Luxembourg is small relative to Germany and the United States. This assumption means Luxembourg cannot influence foreign prices so that foreign supply schedules of grain are perfectly elastic. Let Germany's supply price be \$3.25 per bushel and that of the United States, \$3 per bushel. The United States is assumed to be the more efficient supplier.

Before the formation of the customs union, Luxembourg finds that under conditions of free trade, it purchases all of its import requirements from the United States. Germany does not participate in the market because its supply price exceeds that of the United States. In free trade equilibrium, Luxembourg's consumption equals 23 bushels, production equals 1 bushel, and imports equal 22 bushels. If Luxembourg levies a tariff equal to \$0.50 cents on each bushel imported from the United States (or Germany), then imports will fall from 22 bushels to 10 bushels.

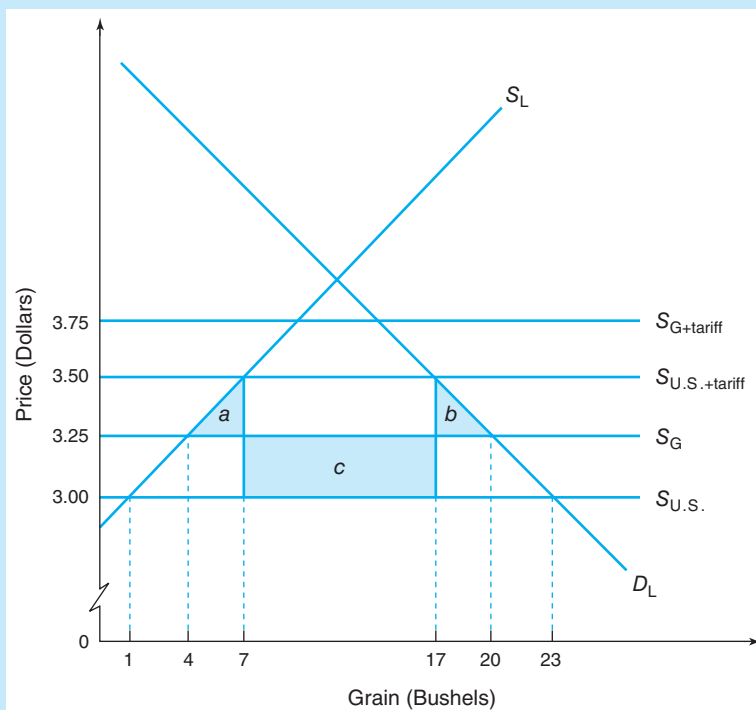
Suppose as part of a trade liberalization agreement, Luxembourg and Germany form a customs union. Luxembourg's import tariff against Germany is dropped, but it is still maintained on imports from the nonmember United States. By removing the tariff, Germany now becomes the low-price supplier. Luxembourg purchases all of its imports, totaling 16 bushels, from Germany at \$3.25 per bushel while importing nothing from the United States.

The movement toward freer trade under a customs union affects world welfare in two opposing ways: a welfare-increasing **trade creation effect** and a welfare-decreasing **trade diversion effect**. The overall consequence of a customs union on the welfare of its members, as well as on the world as a whole, depends on the relative strengths of these two opposing forces.

Trade creation occurs when a domestic production of one customs union member is replaced by another member's lower-cost imports. The welfare of the member countries is increased by trade creation because it leads to increased production specialization according to the principle of comparative advantage. The trade creation effect consists of a *consumption effect* and a *production effect*.

FIGURE 8.1

Static Welfare Effects of a Customs Union



The formation of a customs union leads to a welfare-increasing trade creation effect and a welfare-decreasing trade diversion effect. The overall effect of the customs union on the welfare of its members, as well as on the world as a whole, depends on the relative strength of these two opposing forces.

Before the formation of the customs union and under its own tariff umbrella, Luxembourg imports from the United States at a price of \$3.50 per bushel. Luxembourg's entry into the customs union results in its dropping all tariffs against Germany. Facing a lower import price of \$3.25, Luxembourg increases its consumption of grain by three bushels. The welfare gain associated with this increase in consumption equals triangle *b* in Figure 8.1.

The formation of the customs union also yields a production effect resulting in a more efficient use of world resources. Eliminating the tariff barrier against Germany means that Luxembourg's producers must now compete against lower-cost, more efficient German producers. Inefficient domestic producers drop out of the market, resulting in a decline in home output of three bushels. The reduction in the cost of obtaining this output equals triangle *a* in the figure. This triangle represents the favorable production effect. The overall trade creation effect is given by the sum of triangles $a+b$.

Although a customs union may add to world welfare by way of trade creation, its trade diversion effect generally implies a welfare loss. Trade diversion occurs when imports from a low-cost supplier outside the union are replaced by purchases from a high-cost supplier within the union. This diversion suggests that world production is reorganized less efficiently. In Figure 8.1, the total volume of trade increases under the customs union, part

of this trade (ten bushels) has been diverted from a low-cost supplier, the United States, to a high-cost supplier, Germany. The increase in the cost of obtaining these ten bushels of imported grain equals area c . This is the welfare loss to Luxembourg, as well as to the world as a whole. Our static analysis concludes that the formation of a customs union will increase the welfare of its members, as well as the rest of the world, if the positive trade creation effect more than offsets the negative trade diversion effect. Referring to the figure, this occurs if $a+b$ is greater than c .

This analysis illustrates that the success of a customs union depends on the factors contributing to trade creation and diversion. Several factors that bear on the relative size of these effects can be identified. One factor is the kinds of nations that tend to benefit from a customs union. Nations whose pre-union economies are quite competitive are likely to benefit from trade creation because the formation of the union offers greater opportunity for specialization in production. Also, the larger the size and the greater the number of nations in the union, the greater the gains are likely to be, because there is a greater possibility that the world's low-cost producers will be union members. In the extreme case in which the union consists of the entire world, there exists only trade creation, not trade diversion. In addition, the scope for trade diversion is smaller when the customs union's common external tariff is lower rather than higher. Because a lower tariff allows greater trade to take place with nonmember nations, there will be less replacement of cheaper imports from nonmember nations by relatively high-cost imports from partner nations.

Dynamic Effects

Not all welfare consequences of a regional trading arrangement are static in nature. There may also be dynamic gains that influence member nation growth rates over the long run. These dynamic gains stem from the creation of larger markets by the movement to freer trade under customs unions. The benefits associated with a customs union's dynamic gains may more than offset any unfavorable static effects. Dynamic gains include *economies of scale*, *greater competition*, and a *stimulus of investment*.

Perhaps the most noticeable result of a customs union is market enlargement. Being able to penetrate freely into domestic markets of other member nations, producers can take advantage of economies of scale that would not have occurred in smaller markets limited by trade restrictions. Larger markets may permit efficiencies attributable to greater specialization of workers and machinery, the use of the most efficient equipment, and the more complete use of by products. Evidence suggests that significant economies of scale have been achieved by the EU in such products as steel, automobiles, footwear, and copper refining.

The European refrigerator industry provides an example of the dynamic effects of integration. Prior to the formation of the EU, each of the major European nations that produced refrigerators (Germany, Italy, and France) supported a small number of manufacturers that produced primarily for the domestic market. These manufacturers had production runs of fewer than 100,000 units per year, a level too low to permit the adoption of automated equipment. Short production runs translated into a high per-unit cost. The EU's formation resulted in the opening of European markets and paved the way for the adoption of large-scale production methods, including automated press lines and spot welding. By the late 1960s, the typical Italian refrigerator plant manufactured 850,000 refrigerators annually. This volume was more than sufficient to meet the minimum efficient scale of operation, estimated to be 800,000 units per year. The late 1960s also saw German and French manufacturers averaging 570,000 units and 290,000 units per year, respectively.³

³Nicholas Owen, *Economies of Scale, Competitiveness, and Trade Patterns within the European Community* (New York: Oxford University Press, 1983), pp. 119–139.

Broader markets may also promote greater competition among producers within a customs union. It is often felt that trade restrictions promote monopoly power, whereby a small number of companies dominate a domestic market. Such companies may prefer to lead a quiet life, forming agreements not to compete on the basis of price. With the movement to more open markets under a customs union, the potential for successful collusion is lessened as the number of competitors expands. With freer trade, domestic producers must compete or face the possibility of financial bankruptcy. To survive in expanded and more competitive markets, producers must cut waste, keep prices down, improve quality, and raise productivity. Competitive pressure can also be an effective check against the use of monopoly power and in general a benefit to the nation's consumers.

In addition, trade can accelerate the pace of technical advance and boost the level of productivity. By increasing the expected rate of return to successful innovation and spreading research and development costs more widely, trade can propel a higher pace of investment spending in the latest technologies. Greater international trade can also enhance the exchange of technical knowledge among countries as human and physical capital move more freely. These inducements tend to increase an economy's rate of growth, causing not just a one-time boost to economic welfare, but a persistent increase in income that grows steadily larger as time passes.

The European Union

In the years immediately after World War II, Western European countries suffered balance-of-payments deficits in response to reconstruction efforts. To shield their firms and workers from external competitive pressures, they initiated an elaborate network of tariff and exchange restrictions, quantitative controls, and state trading. However, in the 1950s, these trade barriers were generally viewed as counterproductive. Therefore, Western Europe began to dismantle its trade barriers in response to successful tariff negotiations under the auspices of GATT. The hope was that by binding European nations together economically and financially, it would not be in their interest to go to war.

It was against this background of trade liberalization that the European Union, then known as the European Community, was created by the Treaty of Rome in 1957. The EU initially consisted of six nations: Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany. By 1973, the United Kingdom, Ireland, and Denmark had joined the trade bloc. Greece joined the trade bloc in 1981, followed by Spain and Portugal in 1987. In 1995, Austria, Finland, and Sweden were admitted into the EU. In 2004, ten other Central and Eastern European countries joined the EU: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. In 2007, Bulgaria and Romania joined the EU, and in 2013, Croatia also joined, bringing the membership to 28 countries. The EU views this enlargement process as an opportunity to promote stability in Europe and further the integration of the continent by peaceful means.

Pursuing Economic Integration

According to the Treaty of Rome, the EU agreed in principle to follow the path of economic integration and eventually become an economic union. In pursuing this goal, EU members first dismantled tariffs and established a free trade area in 1968. This liberalization of trade was accompanied by a fivefold increase in the value of industrial trade—higher than world trade in general. The success of the free trade area inspired the EU to continue its process of economic integration. In 1970, the EU became a full-fledged customs union when it adopted a common external tariff system for its members.

Economists have analyzed the economic impact of the EU on its members. Their studies have generally found that trade creation has exceeded trade diversion by 2 to 15 percent. In addition, analysts note that the EU has realized dynamic benefits from integration in the form of additional competition and investment and also economies of scale. For instance, it has been determined that many firms in small nations, such as the Netherlands and Belgium, realized economies of scale by producing both for the domestic market and for export.⁴

After forming a customs union, the EU made little progress toward becoming a common market until 1985. The hostile economic climate (recession and inflation) of the 1970s led EU members to shield their citizens from external forces rather than dismantle trade and investment restrictions. By the 1980s, EU members were increasingly frustrated with barriers that hindered transactions within the bloc. European officials also feared that the EU's competitiveness was lagging behind that of Japan and the United States.

In 1985, the EU announced a detailed program for becoming a common market. This program resulted in the elimination of remaining nontariff trade barriers to intra-EU transactions by 1992. Examples of these barriers included border controls and customs red tape, divergent standards and technical regulations, conflicting business laws, and protectionist procurement policies of governments. The elimination of these barriers resulted in the formation of a European common market and turned the trade bloc into the second largest economy in the world, almost as large as the U.S. economy.

While the EU was becoming a common market, its heads of government agreed to pursue much deeper levels of integration. Their goal was to begin a process of replacing their central banks with a European Central Bank and replacing their national currencies with a single European currency. The **Maastricht Treaty**, signed in 1991, set 2002 as the date this process would be complete. In 2002, a **European Monetary Union (EMU)** emerged with a single currency, known as the **euro**.

When the Maastricht Treaty was signed, economic conditions in the various EU members differed substantially. The treaty specified that to be considered ready for monetary union, a country's economic performance would have to be similar to the performance of other members. Countries cannot, of course, pursue different rates of money growth, have different rates of economic growth, and different rates of inflation while having currencies that don't move up or down relative to each other. The first thing the Europeans had to do was align their economic and monetary policies.

This effort, called convergence, has led to a high degree of uniformity in terms of price inflation, money supply growth, and other key economic factors. The specific **convergence criteria** as mandated by the Maastricht Treaty are as follows:

- **Price stability.** Inflation in each prospective member is supposed to be no more than 1.5 percent above the average of the inflation rates in the three countries with the lowest inflation rates.
- **Low long-term interest rates.** Long-term interest rates are to be no more than 2 percent above the average interest rate in those countries.
- **Stable exchange rates.** The exchange rate is supposed to have been kept within the target bands of the monetary union with no devaluations for at least two years prior to joining the monetary union.
- **Sound public finances.** One fiscal criterion is that the annual budget deficit in a prospective member should be at most 3 percent of gross domestic product (GDP);

⁴Richard Harmsen and Michael Leidy, "Regional Trading Arrangements," in International Monetary Fund, World Economic and Financial Surveys, *International Trade Policies: The Uruguay Round and Beyond, Volume II*, 1994, p. 99.

the other is that the cumulative amount of government debt should be no more than 60 percent of a year's GDP.

The euro is the official currency of 19 of the 28 member states of the European Union. These states, known collectively as the eurozone, are Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain. Notably, the United Kingdom, Denmark, and Sweden have thus far decided not to convert to the euro. The euro is also used in another six European countries and is consequently used daily by some 330 million Europeans. Over 175 million people worldwide use currencies that are pegged to the euro, including more than 150 million people in Africa.

An important motivation for the EMU is the momentum it provides for political union, a long-standing goal of many European policymakers. France and Germany initiated the EMU. Monetary union was viewed as an important way to anchor Germany securely in Europe. Moreover, the EMU provided France with a larger role in determining monetary policy for Europe than it would achieve with a common central bank. Prior to the EMU, Europe's monetary policy was mainly determined by the German Bundesbank.

Agricultural Policy

Besides providing free trade in industrial goods among its members, the EU has abolished restrictions on agricultural products traded internally. A **common agricultural policy** has replaced the agricultural stabilization policies of individual member nations that differed widely before the formation of the EU. A substantial element of the common agricultural policy has been the support of prices received by farmers for their produce. Schemes involving deficiency payments, output controls, and direct income payments have been used for this purpose. In addition, the common agricultural policy has supported EU farm prices through a system of **variable levies** that applies tariffs to agricultural imports entering the EU. Exports of any surplus quantities of EU produce have been assured through the adoption of **export subsidies**.

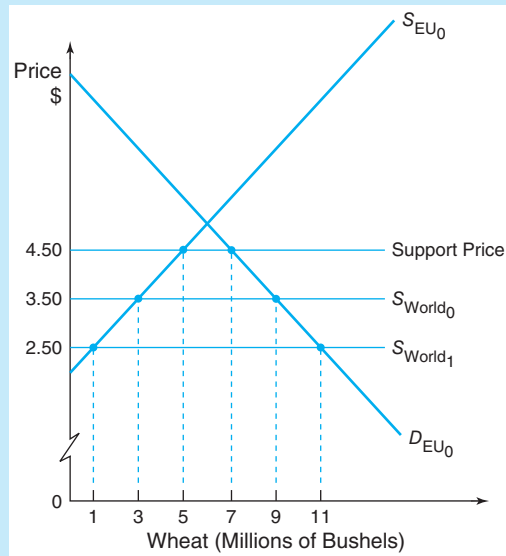
One problem confronting the EU's price support programs is that agricultural efficiencies differ among EU members. Consider the case of grains. German farmers, being high-cost producers, have sought high support prices to maintain their existence. The more efficient French farmers do not need as high a level of support prices as the Germans do to keep them in operation. Nevertheless, French farmers have found it in their interest to lobby for high price supports. In recent years, high price supports have been applied to products such as beef, grains, and butter. The common agricultural policy has encouraged inefficient farm production by EU farmers and has restricted food imports from more efficient nonmember producers. Such trade diversion has been a welfare decreasing effect on the EU.

Variable Levies Figure 8.2 illustrates the operation of a system of variable levies. Assume that S_{EU0} and D_{EU0} represent the EU's supply and demand schedules for wheat and the world price of wheat equals \$3.50 per bushel. Also assume the EU wishes to guarantee its high-cost farmers a price of \$4.50 per bushel. This price cannot be sustained as long as imported wheat is allowed to enter the EU at the free market price of \$3.50 per bushel. Suppose the EU, to validate the support price, initiates a variable levy. Given an import levy of \$1 per bushel, EU farmers are permitted to produce 5 million bushels of wheat as opposed to the 3 million bushels that would be produced under free trade. At the same time, EU imports total 2 million bushels instead of 6 million bushels.

Assume that, owing to increased productivity overseas, the world price of wheat falls to \$2.50 per bushel. Under a variable levy system, the levy is determined daily and equals the

FIGURE 8.2

Variable Levies



The common agricultural policy of the EU has used variable levies to protect EU farmers from low-cost foreign competition. During periods of falling world prices, the sliding scale nature of the variable levy results in automatic increases in the EU's import tariff.

difference between the lowest price on the world market and the support price. The sliding scale nature of the variable levy results in the EU's increasing its import tariff to \$2 per bushel. The support price of wheat is sustained at \$4.50, and EU production and imports remain unchanged. EU farmers are insulated from the consequences of variations in foreign supply. Should EU wheat production decrease, the import levy can be reduced to encourage imports. Then EU consumers are protected against rising wheat prices.

The variable import levy tends to be more restrictive than a fixed tariff. It discourages foreign producers from absorbing part of the tariff and cutting prices to maintain export sales. Cutting prices only triggers higher variable levies. For the same reason, variable levies discourage foreign producers from subsidizing their exports in order to penetrate domestic markets.

The completion of the Uruguay Round of trade negotiations in 1994 brought rules to bear on the use of variable levies. It required that all nontariff barriers, including variable levies, be converted to equivalent tariffs. The method of conversion used by the EU essentially maintained the variable levy system except for one difference. The actual tariff applied on agricultural imports can vary like the previous variable levy, depending on world prices. Now there is an upper limit applied to how high the tariff can rise.

Export Subsidies The EU has also used a system of export subsidies to ensure that any surplus agricultural output will be sold overseas. The high price supports of the common agricultural policy have given EU farmers the incentive to increase production, often in surplus quantities. But the world price of agricultural commodities has generally been below the EU price. The EU pays its producers export subsidies so they can sell surplus

produce abroad at the low price but still receive the higher, international support price. By encouraging exports, the government will reduce the domestic supply and eliminate the need for the government to purchase the excess.

The EU's policy of assuring a high level of income for its farmers has been costly. High support prices for products including milk, butter, cheese, and meat have led to high internal production and low consumption. The result has often been huge surpluses that must be purchased by the EU to defend the support price. To reduce these costs, the EU has sold surplus produce in world markets at prices well below the cost of acquisition. These subsidized sales have met with resistance from farmers in other countries. This is especially true for farmers in poor developing countries who argue that they are handicapped when they face imports whose prices are depressed because of export subsidies or when they face greater competition in their export markets for the same reason.

Virtually every industrial country subsidizes its agricultural products. As seen in Table 8.2, government programs accounted for 18 percent of the value of agricultural products in the EU in 2015. This amount is even higher in certain countries such as Switzerland and Japan, but it is much lower in others, including the United States, Australia, and New Zealand. Countries with relatively low agricultural subsidies have criticized the high subsidy countries as being too protectionist.

TABLE 8.2**Government Support for Agriculture, 2015**

Country	Producer-Subsidy Equivalents* as a Percentage of Farm Prices
Switzerland	58
Norway	58
South Korea	52
Japan	48
Iceland	47
European Union	18
Mexico	14
Canada	11
United States	11
Australia	4
New Zealand	1

*The producer-subsidy equivalent represents the total assistance to farmers in the form of market price support, direct payments, and transfers that indirectly benefit farmers.

Source: From Organization of Economic Cooperation and Development (OECD), *Agricultural Policy Monitoring and Evaluation*, 2016. See also World Trade Organization, *Annual Report*, various issues.

For a discussion of government procurement policy and the European Union, go to *Exploring Further 8.1*, which can be found in MindTap.

Is the European Union Really a Common Market?

For decades, members of the EU have tried to build a common market with uniform policies on product regulation, trade, and movement of factors of production. But are the policies of these countries really that common?

Consider the case of Kellogg Co., the American producer of breakfast cereals. For years Kellogg has petitioned members of the EU to let it market identical vitamin fortified cereals throughout Europe. The firm's requests have run into numerous roadblocks. Government regulators in Denmark do not want vitamins added, dreading that cereal consumers who already take multivitamins might surpass recommended daily doses that could jeopardize health. The Netherlands' regulators don't think that either folic acid or vitamin D is beneficial, so they don't want them included. However, Finland prefers more vitamin D than other nations to help Finns compensate for lack of sun. Kellogg has to produce four different varieties of cornflakes and other cereals at its plants in the United Kingdom.

The original concept of the EU was a common market based on uniform regulations. By producing for a single market throughout Europe, firms could attain production runs large enough to realize substantial economies of scale. Instead, persistent national differences have burdened firms with extra costs that stifle plant expansion and job creation.

This lack of consistency extends well beyond the domain of breakfast cereals. Caterpillar Inc. sells tractors throughout Europe. In Germany, its vehicles must include a louder backup horn and lights that are installed in different locations. The yield signs and license plate holders on the backs of tractors and other earth-moving vehicles must differ, sometimes by just centimeters, from nation to nation. Officials at Caterpillar contend that there is no sound justification for such regulatory discrepancies. Discrepancies only make it hard to mass produce in an efficient manner.

Persistent regulatory differences between markets have adversely affected business expansion plans throughout Europe. IKEA Group, the Swedish furniture retailer, must pay for studies to prove that its entry into markets will not displace local businesses. According to IKEA, each study costs approximately \$25,000 and takes about a year before a decision is made. Moreover, only 33 to 50 percent of IKEA's petitions result in approval.

Although members of the EU have advanced to higher levels of economic unification in the past 50 years, regulatory differences remain that have created barriers to trade and investment that stifle economic growth. These barriers have resulted in numerous legal battles between producers and national regulators, as well as between the European Commission and individual governments. Europe's common market remains uncommon.⁵

Britain Announces Withdrawal from the European Union (Brexit)

During the past 60 years, the movement toward increasing economic integration has been remarkably durable. Since the founding of the EU in 1957, 28 countries have joined and none have left (other than Greenland, a Danish territory, and Algeria, which stopped being part of the EU upon independence from France). This is mainly because government officials have accepted the economic rationale for integration: It increases the size of the market, exposes domestic producers to more competition, and accelerates the dissemination of new ideas via foreign investment and immigration. As another example of economic integration, since the World Trade Organization's beginnings in 1948 (as the General Agreement on Tariffs and Trade), 164 countries have joined and none have left.

Yet on June 23, 2016, the United Kingdom (UK) settled a question that remained at the center of attention for a generation: Should the country remain within the EU, or

⁵"Corn Flakes Clash Shows the Glitches in European Union," *The Wall Street Journal*, November 1, 2005, p. A1.

leave the organization and go it alone? Voters of the UK addressed this question in a referendum on the country's membership. The result of the referendum was a vote of 52 percent to 48 percent to exit the EU. The British exit from the EU became known as **Brexit**—a combination of “Britain” and “exit.” How did Brexit come about and what does it mean?

A key point to remember is that the Brexit referendum was the beginning of a process, it's not the end. Now that the referendum has passed, the UK and the EU have started a process of negotiations that can take two years to finalize the “divorce settlement”—a timetable that can be extended only with the consent of all concerned. If no agreement were reached, the UK would have to revert to trading with the EU under WTO rules, which would imply tariffs and no special deal for financial services.

The Brexit Referendum of 2016 The notion of the UK's leaving the EU has been debated for decades, but it gained renewed momentum in the midst of a tough reelection campaign in 2013. Facing strong anti-EU feelings within his own party, Prime Minister David Cameron pledged to call a referendum on EU membership if the Conservatives won the election in 2015. After they won in a landslide, the Brexit referendum was scheduled for June 23, 2016.

Brexit turned out to be a classic example of the law of unintended consequences. Cameron sought a vote to remain in the EU in order to end, once and for all, domestic disputes about Europe in a minority of the Conservative Party and among fringe populist groups. However, his strategy failed when UK voters unexpectedly decided to leave the EU.

The Brexit movement essentially split Cameron's Conservative party down the middle, with many prominent government members on both sides of the debate. Skeptics of the EU worried that too much national sovereignty was sacrificed to Brussels (Belgium), the de-facto capital of the EU. Moreover, rising fears about immigration contributed to concerns about European integration—the EU treaty grants its citizens the right to live and work in other member countries such as the UK. In contrast, the opposing Labour party was solidly in favor of remaining in the EU. The result of the Brexit referendum was that UK voters surprised the world by narrowly approving a proposal to abandon the EU and strike out on their own. Let us consider some of the pros and cons regarding Brexit.

Pros and Cons Regarding Brexit Supporters of Brexit maintain that the UK would be better off politically and economically by reclaiming sovereignty and being free from EU regulations that hinder the UK's competitiveness. They also contend that the UK's contributions to the EU budget are too expensive. For example, in 2015 the UK paid 13 billion pounds to the EU, but it received only 4.5 billion pounds worth of spending from the EU, so the UK's net contribution was 8.5 billion pounds. Moreover, Brexit supporters fear that high levels of immigration to the UK from other EU countries will mean fewer jobs and lower wages for UK citizens.

However, those in favor of continued membership in the EU warn of potentially dire economic consequences of a vote to leave. They maintain that the UK's trade and investment ties with the EU are so deep and extensive that Brexit could lead to weaker economic growth, higher inflation, and a depreciation of the pound. They also argue that EU membership helps to attract foreign affiliates and foreign direct investment to the UK and gives the UK more influence in global politics.

Some analysts argue that Brexit could seriously undermine the future of the EU, prompting calls in other EU countries for special membership conditions or additional policy opt-outs. It could also lead to a prolonged period of uncertainty, division, and introspection in the EU as the block seeks to disentangle the UK and agree on the terms of the dissolution. Given the UK's foreign policy clout and defense capabilities, Brexit could also diminish the EU's role as an international actor. Yet others suggest that, as a result of Brexit, the EU could emerge as a more like-minded bloc, able to pursue deeper integration without the UK's opposition.

Negotiating a Withdrawal from the EU According to the regulations of the EU, a member state that wants to exit the bloc needs to first formally notify the other 27 governments, initiating a complex process set out in Article 50 of the treaty. Doing so would open a two-year window—and possibly a longer period—to work out myriad issues, from single-market access for UK companies, to Britain's sharing of EU security databases in the fight against terrorism. Many European politicians indicated that they wanted the UK out as soon as possible to discourage other countries from taking a similar tack in an effort to get a better deal. The UK government started the withdrawal process in March 2017, putting the UK on course to leave by April 2019.

As the UK negotiated on its terms of withdrawal from the EU, it wanted to maintain extensive ties with Europe while removing or reducing the constraints of its many legislative and bureaucratic requirements. The EU leadership had almost the opposite incentive. It did not wish to reward the UK's exit by granting the UK better terms than it enjoyed as a full member. Thus, a punitive element may be inherent in the EU's bargaining position.

The mildest sort of Brexit would be an arrangement like Norway's, involving continuing access to Europe's "single market" in return for the free movement of people from EU countries and a contribution to the EU budget. The Norwegian option would do the least harm to the economy of the UK. It would also be the best chance to preserve the union with Scotland and Northern Ireland, both of which voted to remain in the EU. At the opposite extreme, the UK could remove its links completely, meaning no more payments into the EU budget and no more unlimited migration. However, there would be no special access to the market which purchases almost half of the UK's exports, either.

Some UK officials have maintained that the UK might be able to negotiate access to the EU's single market without obeying all of the rules. For example, UK citizens might still be able to live, travel, study, work, and buy homes on the continent but the same rights would not be automatically extended to EU citizens in the UK. Also, the UK might be freed from sending a substantial sum of money to the EU budget, which instead could be used for the UK's national health system. However, EU officials tended to dismiss the idea that the UK could stay in the single market without following the rules. They noted that if the EU gives that kind of deal to the UK, then why not to other disgruntled members of the EU? It would be a free-for-all. Simply put, many analysts felt that if the UK is to maintain access to Europe's single market once outside the EU, the UK would likely have to make a contribution to the EU budget, accept some level of free movement of people, and adhere to EU regulations over which it would no longer have a say.

As for the EU, punishing the UK will not solve the issue of how to operate a common currency (the euro) in the absence of a common fiscal policy among countries with disparate economic capacities, or how to define a union whose ability to achieve common political strategies lags fundamentally behind its economic and administrative capabilities.

The task of dismantling Britain from the EU was viewed as being huge, given the strong links across the English Channel in commerce, security, and dozens of other areas. Britain not only would need to negotiate its way out of the 28-member bloc, but also needed to ink new trade deals and other agreements to replace the EU ones it has relied on to do business with the rest of the world.

Britain also faces a threat to its very existence. Leaders in pro-EU Scotland and Northern Ireland have indicated that they may push for a new referendum for secession from the United Kingdom. A departure of these countries would even further limit Britain's international clout, not least because Scotland is home to Britain's nuclear arsenal—raising thorny questions of whether London would relocate the program or abandon it altogether in the event of a Scottish vote to leave.

The exit of the UK from the EU was in process at the writing of this text. It remains to be seen how this process will evolve.⁶

Economic Costs and Benefits of a Common Currency: The European Monetary Union

As we learned, the formation of the EMU (also known as the eurozone) in 1999 resulted in the creation of a single currency (the euro) and a European Central Bank. Switching to a new currency is extremely difficult. Just imagine the task if each of the 50 U.S. states had its own currency and central bank, then had to agree with the other 49 states on a single currency and a single financial system. That's exactly what the Europeans have done.

The European Central Bank is located in Frankfurt, Germany, and is responsible for the monetary policy and exchange rate policies of the EMU. The European Central Bank alone controls the supply of euros, sets the short-term euro interest rate, and maintains permanently fixed exchange rates for the member countries. With a common central bank, the central bank of each participating nation performs operations similar to those of the 12 regional Federal Reserve Banks in the United States.

For Americans, the benefits of a common currency are easy to understand. Americans know they can walk into a McDonald's or Burger King anywhere in the United States and purchase hamburgers with dollar bills in their purses and wallets. The same was not true in European countries prior to the formation of the EMU. Because each was a distinct nation with its own currency, a French person could not buy something at a German store without first exchanging his French francs for German marks. This exchange would be like someone from St. Louis having to exchange her Missouri currency for Illinois currency each time she visits Chicago. To make matters worse, because marks and francs floated against each other within a range, the number of marks the French traveler receives today would probably differ from the number he would have received yesterday or might receive tomorrow. On top of exchange rate uncertainty, the traveler also had to pay a fee to exchange the currency, making a trip across the border a costly proposition indeed. Although the costs to individuals can be limited because of the small quantities of money involved, firms can incur much larger costs. By replacing the various European currencies with a single currency, the euro, the EMU can avoid such costs. The euro helps lower the costs of goods and services, facilitates a comparison of prices within the EU, and promotes more uniform prices.

⁶“Brexit Fallout: Adrift,” *The Economist*, July 2–8, 2016, p. 10; Kristin Archick, *The European Union: Current Challenges and Future Prospects*, Congressional Research Service, June 21, 2016; “Between the Borders,” *The Economist*, June 16, 2016, pp. 45–50; Greg Ip, “Impact of Brexit Would Likely Be Gradual and Global,” *The Wall Street Journal*, June 23, 2016; and Henry Kissinger, “Out of the Brexit Turmoil: Opportunity,” *The Wall Street Journal*, June 29, 2016.

Optimal Currency Area

Much analysis of the benefits and costs of a common currency is based on the theory of optimal currency areas.⁷ An **Optimal currency area** is a region in which it is economically preferable to have a single official currency rather than multiple official currencies. The United States can be considered an optimal currency area. It is inconceivable that the current volume of commerce among the 50 states would occur as efficiently in a monetary environment of 50 different currencies. Table 8.3 highlights some of the advantages and disadvantages of forming a common currency area.

TABLE 8.3

Advantages and Disadvantages of Adopting a Common Currency

Advantages	Disadvantages
The risks associated with exchange fluctuations are eliminated within a common currency area.	Absence of individual domestic monetary policy to counter macroeconomic shocks
Costs of currency conversion are lessened.	Inability of an individual country to use inflation to reduce public debt in real terms
The economies are insulated from monetary disturbances and speculation.	The transition from individual currencies to a single currency could lead to speculative attacks.
Political pressures for trade protection are reduced.	

According to the theory of optimal currency areas, there are gains to be had from sharing a currency across countries' boundaries. These gains include more uniform prices, lower transaction costs, and greater certainty for investors, and enhanced competition. A single monetary policy run by an independent central bank should promote price stability.

However, a single policy can also entail costs, especially if interest rate changes affect different economies in different ways. The broader benefits of a single currency must be compared against the loss of two policy instruments: an independent monetary policy and the option of changing the exchange rate. Losing these is particularly acute if a country or region is likely to suffer from economic disturbances (recession) that affect it differently from the rest of the single currency area, because it will no longer be able to respond by adopting a more expansionary monetary policy or adjusting its currency.

Optimal currency theory considers various reactions to economic shocks. The first is the mobility of labor: Workers in the affected country must be able and willing to move freely to other countries. The second is the flexibility of prices and wages: The country must be able to adjust these in response to a disturbance. The third is some automatic mechanism for transferring fiscal resources to the affected country.

The theory of optimal currency areas concludes that for a currency area to have the best chance of success, countries involved should have similar business cycles and economic structures. The single monetary policy should affect all the participating countries in the same manner. There should be no legal, cultural, or linguistic barriers to labor mobility across borders, there should be wage flexibility, and there should be some system of stabilizing transfers.

⁷The theory of "optimum currency areas" was first analyzed by Robert Mundell, who won the 1999 Nobel Prize in Economics. See Robert Mundell, "A Theory of Optimum Currency Areas," *American Economic Review*, Vol. 51, September 1961, pp. 717–725.

INTERNATIONAL TRADE APPLICATION

European Monetary “Disunion”

A main goal of the European Monetary Union is to promote economic and political unification throughout Europe. Two world wars fought in Europe, plus the Depression of the 1930s that was fueled by protectionist trade policies, made a compelling case to dismantle the political and economic borders of post–World War II Europe. The United States encouraged closer economic ties to promote European reconstruction in view of expanding Soviet communism. Supporters maintained that monetary union would foster European peace and also restore European geopolitical power, with a currency on par with the U.S. dollar.



As Europe proceeded toward the euro and monetary union, concerns about the lack of fiscal union to support it were swept aside. Some economists predicted that a monetary union without a political mechanism to supervise fiscal policy (rein in budget deficits) would eventually make the monetary union impossible to maintain. They also contended that a uniform monetary policy geared to the low inflation of Germany (the largest member) might result in an interest rate that was too low for smaller, high-inflation countries like Greece, leading to trade deficits fueled by easy credit. These economists were often ridiculed by the European media for their alarmist views.

When the eurozone was being formed, the government of Germany insisted that Italy, as the fourth-largest European economy, be a founding member even though it did not fulfill the condition of sound government finances. Once debt-ridden Italy was included, there was no argument for excluding high-spending countries such as Greece, Ireland, and Portugal, which became members of the eurozone. The eurozone consisted of the fiscally

healthier countries such as Germany and the fiscally weak countries like Greece. As the global debt crisis emerged during the Great Recession of 2007–2009, it became increasingly apparent that although the eurozone has a single currency, the member countries are not identical.

Skeptics note that the euro was a bold venture that placed the cart before many horses. The basic problem is that the eurozone is not a single country. Initially 11, and now 19, sovereign countries signed up for a currency union without first homogenizing their budget policies, tax systems, and bank regulations—that is, they did not form an economic union as discussed at the beginning of this chapter. They did so without creating a central government strong enough to enact cross-border fiscal discipline or finance cross-country transfers. Disunity within the eurozone mounted as some countries pursued sound fiscal policies while others pursued unsound policies. Fears have spread that the weak nations of the eurozone could default on their debt and might have to pull out of the eurozone.

To lessen such fears, the eurozone countries met in 2011 and pledged that each member would enact a constitutional rule to balance its budget and face penalties if its actual deficit exceeds 3 percent of its GDP. The fines could cost billions of euros. Critics maintain that there is no enforcement mechanism for this pledge and it could easily be violated and watered down to be completely ineffective. At the writing of this text, the determination of the eurozone members to achieve fiscal integrity remains unclear.

What do you think? Do you think that the eurozone countries will ever achieve fiscal union?

Eurozone’s Problems and Challenges

Although the EMU has resulted in some economic efficiencies for its members, it has also suffered from several problems. Recall that to be included in the EMU, countries were supposed to fulfill certain economic criteria, such as small budget deficits, low inflation, and interest rates close to the eurozone’s average. However, some countries (such as Greece) did not appear to fulfill these standards when they were accepted into the monetary union. These standards were sometimes ignored once countries became members of the monetary union. This put the eurozone on weak financial footing from its beginnings.

Another problem has been the integration of differing economies into a monetary union without a way to adjust these economies. During 1999–2016, productivity in the northern member nations (Germany) increased rapidly while productivity remained sluggish in the southern nations (Italy and Greece). This resulted in labor cost per unit of output in the north falling about 25 percent compared to the south. Normally, exchange rate adjustments would shrink this discrepancy. The exchange rates of the southern nations would depreciate relative to the currencies of the northern nations, increasing the competitiveness of the southern nations.

However, within the eurozone, there are no exchange rates to change because there is only one currency, the euro. Without an exchange rate as an adjustment mechanism, rebalancing economies would require southern workers to move freely to growing northern economies, prices rising in the north, wealthy northern nations subsidizing poorer southern nations, workers of poorer southern nations accepting unemployment to grind down wages, and so on. It is difficult to achieve these adjustments in practice, because political barriers abound throughout Europe.

Therefore, without the normal adjustment mechanisms to keep economic imbalances from destroying the eurozone, some analysts have pushed for the concept of fiscal union. This would result in the integration of the fiscal policies of the eurozone countries, including taxation and government spending programs. The idea would be to impose budget discipline on the laggard, deficit countries. Control over fiscal policy has been regarded as essential to national sovereignty, and eurozone members have not been willing to give up their fiscal independence. The eurozone has a monetary union, but it does not have a fiscal union.

Although fiscal policy remains the province of national governments of the eurozone, avoidance of excessive budget deficits is vital for the success of the monetary union. Because large budget deficits can lead to high interest rates and lower economic activity, budgetary restraint is desirable. Most countries have considerable difficulty in reducing budget deficits and debts to meet the convergence criteria of the EMU. Cutting government expenditures, especially on well-established social programs, was (and is) politically difficult. In the face of aging populations in most countries, pressures on budgets may grow even stronger.

An important monetary policy challenge for the EMU is the ability of the European Central Bank to focus on price stability over the long term. Some are concerned that over time, monetary policy may become too expansionary given the large number of countries voting on monetary policy and the fact that strong anti-inflationary actions are not well ingrained in countries like Greece, Portugal, Spain, Italy, and Cyprus.

The need for structural reform in European countries presents a challenge for EMU countries. Labor market flexibility is an important structural issue. Real (inflationary adjusted) wage flexibility in Europe is estimated to be half that of the United States. Labor mobility is quite low in Europe, not only between countries, but also within them. Incentives to work and acquire new skills are inadequate. Regulations that limit employers' ability to dismiss workers make them unwilling to hire and train new workers. Also, high taxes and generous unemployment benefits provided by European governments contribute to sluggish economies.

Analysts note that structural reforms are necessary for several reasons. First, they would lower the EU's persistently high structural unemployment rate. Second, firms would provide needed flexibility in adjusting to recessions, especially those that affected one or a few countries in the eurozone. If prices and wages were flexible downward, a decline in demand would be followed by lower prices, tending to raise demand. Increased labor mobility would be particularly useful in adjusting to recessions.

Greece and the Eurozone

The experience of Greece illustrates some of the challenges of the eurozone. As a result of the global financial crisis that began in 2007–2008, the eurozone entered its first official recession. The severity of this downturn came close to breaking up the eurozone as financially weak members such as Greece, Portugal, Cyprus, and Spain teetered on the verge of bankruptcy.

In 2008, Greece was in deep recession, its economy was uncompetitive with northern eurozone members like Germany, and its debt was more than three times as large as previously estimated. With debt piling up, investors feared that Greece could not pay its international obligations. To shore up Greece's financial position, other eurozone countries, in conjunction with the International Monetary Fund (IMF), agreed on a package that gave Greece 110 billion euros in loans. When this bailout was agreed to, it was feared that a Greece exit from the eurozone would cause so much panic in the markets that other vulnerable countries might also be pushed into default. Thus, keeping Greece in the eurozone was considered essential for the financial stability of the currency bloc. In return for the loans, the government of Greece reluctantly agreed to implement an austerity program intended to bring down its deficit. This resulted in budget cuts, a freeze on public sector wages, pension reforms, increased taxes, and efforts to rein in rampant tax evasion. However, the markets remained skeptical about the government's ability to deliver, partly because the austerity program might crumble as social and political discontent increased.

By 2015, it became apparent that the previous bailout wasn't doing the trick as Greece's economy continued to crumble. Its gross domestic product declined by a quarter over five years, unemployment was over 25 percent, and youth unemployment was over 50 percent. Partly to blame was the austerity program demanded by the creditors. Critics maintained that it attempted to reduce Greece's budget deficit too fast, thus intensifying the country's economic downturn.

Events intensified when Greece announced that it could not fulfill its debt payments to the IMF. To minimize the financial panic of a bankrupt Greece, the government imposed capital controls that prevented the movement of euros out of Greece and temporarily closed domestic banks to prevent depositors from rushing to withdraw euros from their accounts. After much wrangling with creditor nations, Greece agreed to another bailout program in which 94 billion euros were lent to Greece in exchange for additional austerity measures. Indeed, the people of Greece felt that they were losing their sovereignty to creditors including the European Central Bank and the IMF. Yet the people of northern Europe, who were lenders to Greece, were becoming increasingly dissatisfied about Greece's lackluster economic performance.

Part of the problem of the eurozone is that it is not a single country and its mechanisms for fiscal transfers across borders are underdeveloped and contentious. Consider the following analogy. In the United States, Maryland is one of the richest states in terms of per-capita income, whereas Mississippi is among the poorest states. For decades, the taxpayers of Maryland have made fiscal transfers to Mississippi, channeled through the federal government. But few taxpayers dwell on it, and it is not voted on. The transfers occur automatically because Maryland and Mississippi are in the same country. However, the taxpayers of wealthy northern European countries, like Germany, are not in the same country as the poor people of Greece. Do Germans widely favor fiscal transfers to Greeks? Would Americans vote for transfers for Mexico? It is not hard to see why the people of northern Europe are often reluctant to channel funds to those of southern Europe.

Although the 2015 bailout provided temporary relief to Greece, it did not eliminate the underlying economic problems. Greece needs to escape its existing depression, reduce its debt burden, and restore its competitiveness. This requires a change of mind-set to address the country's structural impediments to economic growth: rampant clientelism, hopeless public administration, bad governmental regulations, a lethargic and unreliable justice system, nationalized assets and oligopolies, and inflexible markets for goods and services and labor.

Under floating exchange rates, the competitive imbalance between northern and southern Europe would be addressed by depreciation of southern European currencies. But that cannot occur with the euro, a single currency. The solution could be either large wage hikes in northern Europe or punishing wage reductions in southern Europe, a poor solution. As a result, many observers conclude that the Greek problem will continue as long as Greece remains in the eurozone.

All of these problems relate to questionable decisions made by the eurozone's founders prior to its implementation. In the 1990s, the euro was just an idea. It was seen as a way of ensuring that Germany and France would never go to war again. However, many economists feared that the countries of Europe were not suited to adopting a single currency because they did not fulfill the conditions of an optimal currency area: a group of nations with similar business cycles and considerable labor mobility, political unity, and cross-country fiscal transfers. Yet the founders of the eurozone did not disagree with this concern. Instead, they played down its significance by switching the order; that is, they pledged to first create a common currency, and then create the conditions that make it work. In practice, achieving this strategy has been very difficult for the people of the eurozone. At the writing of this text, the future of the eurozone, and Greece's membership in the currency bloc, is uncertain.

Deflation and the Eurozone

In 2016, the world economy was not in good health. Although the performance of the U.S. and British economies was reasonably positive, China's growth rate was declining. Also, Japan's economy was struggling, as were the economies of continental Europe (the eurozone). Not only were prices falling throughout Europe, but the overall inflation rate was slipping to under 0.5 percent. The question was whether Europe would fall into deflation, as Japan did in the late 1990s and the United States did during the Great Depression.

Deflation is a sustained decline in the general level of prices. It occurs when price decreases are so widespread and sustained that they result in a broad-based price index such as the Consumer Price Index steadily declining for more than one or two quarters. Thus, the inflation rate falls below zero percent, suggesting a negative inflation rate.

Although many Europeans, especially the Germans, have feared the destabilizing effects of inflation, deflation can also disrupt an economy. First, falling prices may cause consumers and businesses to postpone purchases in the hope of realizing lower prices in the future. As spending sinks, output and employment decline and loan defaults rise. That is what occurred during the Great Depression, with brutal consequences for Germany in the early 1930s. Also, falling prices increase the burden of debt because borrowers are now forced to repay their loans with money that has reduced purchasing power.

It is possible that deflation can be the result of improving developments on an economy's supply side. For example, improving technology may allow an economy to produce more goods and services at a lower cost, thus increasing households' real incomes. However, deflation can also originate on the economy's demand side. It occurs when spending runs continually below the economy's capacity to supply goods and services, resulting in an output gap. That prompts businesses to reduce prices and wages, which weakens demand

further. Also, the real value of debts increases, forcing borrowers to reduce spending to pay down their debts, which aggravates matters even more. Japan slipped into deflation in the late 1990s as a collapsed property bubble left the banking system struggling with bad debt and the level of total spending declining.

With the rate of inflation well below the European Central Bank's (ECB) target rate of 2 percent in 2015, policymakers feared that the eurozone could slip into deflation. This resulted in the ECB's implementation of an expansionary monetary policy to steer inflation back to its target. By 2017, the deflationary pressures were subsiding, although the financial position of the eurozone remained weak.

North American Free Trade Agreement

The success of Europe in forming the European Union inspired the United States to launch several regional free trade agreements. During the 1980s, the United States entered into discussions for a free trade agreement with Canada that became effective in 1989. This paved the way for Mexico, Canada, and the United States to form the **North American Free Trade Agreement (NAFTA)** that went into effect in 1994.

NAFTA's visionaries in the United States made a revolutionary gamble. Mexico's authoritarian political system, repressed economy, and resulting poverty were creating problems that could not be contained at the border in perpetuity; Mexican instability would eventually spill over the Rio Grande. The choice was easy—either help Mexico develop as part of an integrated North America, or watch the economic gap widen and the risks for the United States increase.

The establishment of NAFTA was expected to provide each member nation better access to the others' markets, technology, labor, and expertise. In many respects, there were remarkable fits between the nations: The United States would benefit from Mexico's pool of cheap and increasingly skilled labor, while Mexico would benefit from U.S. investment and expertise. Negotiating the free trade agreement was difficult because it required meshing two large advanced industrial economies (the United States and Canada) with that of a sizable developing nation (Mexico). The huge living standard gap between Mexico, with its lower wage scale, and the United States and Canada was a politically sensitive issue. One of the main concerns about NAFTA was whether Canada and the United States as developed countries had much to gain from trade liberalization with Mexico. Table 8.4 highlights some of the likely gains and losses of integrating the Mexican and U.S. economies.

TABLE 8.4

Winners and Losers in the United States under Free Trade with Mexico

U.S. Winners

Higher-skill, higher-tech businesses and their workers benefit from free trade.

Labor-intensive businesses that relocate to Mexico benefit by reducing production costs.

Domestic businesses that use imports as components in the production process save on production costs.

Consumers in the United States benefit from less expensive products because of increased competition with free trade.

U.S. Losers

Labor-intensive, lower-wage, import-competing businesses lose from reduced tariffs on competing imports.

Workers in import-competing businesses lose if their businesses close or relocate.

NAFTA's Benefits and Costs for Mexico and Canada

NAFTA's benefits to Mexico have been proportionately much greater than for the United States and Canada because these economies are many times larger than Mexico's. Eliminating trade barriers has led to increases in the production of goods and services for which Mexico has a comparative advantage. Mexico's gains have come at the expense of other low-wage countries, such as Korea and Taiwan. Generally, Mexico has produced more goods that benefit from a low-wage, low-skilled workforce, such as tomatoes, avocados, fruits, vegetables, processed foods, sugar, tuna, and glass; labor-intensive manufactured exports such as appliances and economy automobiles have also increased. Rising investment spending in Mexico has helped increase wage incomes and employment, national output, and foreign exchange earnings; it also has facilitated the transfer of technology.

Although agriculture represents only 4 to 5 percent of Mexico's GDP, it supports about a quarter of the country's population. Most Mexican agricultural workers are subsistence farmers who plant grains and oilseeds in small plots that have supported them for generations. Mexican producers of rice, beef, pork, and poultry claim they have been devastated by U.S. competition in the Mexican market resulting from NAFTA. They claim they cannot compete against U.S. imports where easy credit, better transportation, better technology, and major subsidies give U.S. farmers an unfair advantage.

For Canada, initial concerns about NAFTA had less to do with the flight of low-skilled manufacturing jobs, because trade with Mexico was much smaller than it was for the United States. Instead, the main concern was that closer integration with the U.S. economy would threaten Canada's social welfare model, either by causing certain practices and policies (such as universal health care or a generous minimum wage) to be considered as uncompetitive or by imposing downward pressure on the country's base of personal and corporate taxes, thus starving government programs of resources. Canada's social welfare model currently stands intact.

Canada's benefits from NAFTA have been mostly in the form of safeguards: maintenance of its status in international trade, no loss of its current free trade preferences in the U.S. market, and equal access to Mexico's market. Canada also desired to become part of any process that would eventually broaden market access to Central and South America. Although Canada hoped to benefit from trade with Mexico over time, most researchers have estimated that there have been relatively small gains because of the small amount of existing Canada–Mexico trade.

Although it has succeeded in stimulating increased trade and foreign investment, NAFTA alone has not been enough to modernize Mexico or guarantee prosperity. This result has been a disappointment to many Mexicans. Trade and investment can do only so much. Since the beginnings of NAFTA, the government of Mexico has struggled to deal with the problems of corruption, poor education, red tape, crumbling infrastructure, lack of credit, and a tiny tax base. These factors greatly influence a country's economic development. For Mexico to become an economically advanced nation, it needs a better educational system, cheaper electricity, better roads, and investment incentives for generating growth—things that NAFTA cannot provide.

NAFTA's Benefits and Costs for the United States

NAFTA proponents maintain that the agreement has benefited the U.S. economy overall by expanding trade opportunities, reducing prices, increasing competition, and enhancing the ability of U.S. firms to attain economies of large-scale production. The United States has produced more goods that benefit from large amounts of physical capital and a highly skilled workforce, including chemicals, plastics, cement, sophisticated electronics and communications gear, machine tools, and household appliances. American insurance companies have also benefited from fewer restrictions on foreign insurers operating in Mexico.

American companies, particularly larger ones, have realized better access to cheaper labor and parts. The United States has benefited from a more reliable source of petroleum, less illegal Mexican immigration, and enhanced Mexican political stability as a result of the nation's increasing wealth. Despite these benefits, the overall economic gains for the United States are estimated to be modest, because the U.S. economy is 25 times the size of the Mexican economy and many U.S.–Mexican trade barriers were dismantled prior to the implementation of NAFTA.

Economies of scale represent another benefit of NAFTA. A member of NAFTA can overcome the smallness of its domestic markets and realize economies of scale in production by exporting to other members. NAFTA has allowed U.S. manufacturing giants from General Motors to General Electric to use economies of scale for their production lines. Prior to NAFTA, GM's assembly plants in Mexico assembled small volumes of many products that resulted in high costs and somewhat inferior quality. Now its plants in Mexico specialize in a few high-volume products, resulting in low costs and higher quality. This result benefits both U.S. and Mexican consumers. For an analysis of the effects of economies of scale in manufacturing, go to *Exploring Further 8.2*, which can be found in MindTap.

Even ardent proponents of NAFTA acknowledge that it has inflicted pain on some segments of the U.S. economy. On the business side, the losers have been industries such as citrus growing and sugar that rely on trade barriers to limit imports of low-priced Mexican goods. Other losers are unskilled workers, such as those in the apparel industry, whose jobs are most vulnerable to competition from low-paid workers abroad.

American labor unions have been especially concerned that Mexico's low wage scale encourages U.S. companies to locate in Mexico, resulting in job losses in the United States. Cities such as Muskegon, Michigan, which has thousands of workers cranking out such basic auto parts as piston rings, are especially vulnerable to low-wage Mexican competition. Indeed, the hourly manufacturing compensation for Mexican workers has been a small fraction of that paid to U.S. and Canadian workers.

According to NAFTA critics, there would be a “giant sucking sound” from U.S. companies moving to Mexico to capitalize on Mexico's cheap labor. After more than a decade, U.S. companies have not relocated to Mexico in the large numbers forecasted. International trade theory tells us why. As seen in Table 8.5, the productivity of the average American worker (GDP per worker) was \$121,638 in 2015, whereas the productivity of the average Mexican

TABLE 8.5

Gross Domestic Product (Purchasing Power Parity), Employment, and Labor Productivity, 2015

Country	Gross Domestic Product (trillions)	Employment (millions)*	Labor Productivity**
United States	\$18.27	150.2	\$121,638
Australia	1.16	11.9	97,479
Germany	3.99	43.2	92,361
Canada	1.66	18.1	91,713
United Kingdom	2.74	31.4	87,261
Japan	4.91	63.7	77,080
Mexico	2.26	51.4	43,969
China	19.95	824.6	24,194

* Employment = (1 – unemployment rate) × labor force.

** Labor productivity = GDP/number of persons employed. Due to rounding, numbers are not precise.

Source: Central Intelligence Agency, *World Fact Book*, <http://www.cia.gov>. See also World Bank Group, *Data and Statistics*, <http://www.worldbank.org/data/>; and International Monetary Fund, *International Financial Statistics*.

worker was \$43,969. The U.S. worker was about 2.75 times as productive as the Mexican worker. Employers could pay U.S. workers 2.75 times as much as Mexican workers without any difference in cost per unit of output. Also, companies operating in the United States benefit from a more stable legal and political system than exists in Mexico.

Another concern is Mexico's environmental regulations, criticized as being less stringent than those of the United States. American labor and environmental activists fear that polluting Mexican plants might cause plants in the United States, which are cleaner but more expensive to operate, to close down. Environmentalists also fear that increased Mexican growth will bring increased air and water pollution. NAFTA advocates argue that a more prosperous Mexico might be more willing and able to enforce its environmental regulations; more economic openness is also associated with production closer to state-of-the-art technology, which tends to be cleaner. Proponents of NAFTA view it as an opportunity to create an enlarged productive base for the entire region through a new allocation of productive factors that would permit each nation to contribute to a larger pie. An increase in U.S. and Canadian trade with Mexico resulting from the reduction of trade barriers under NAFTA would partly displace U.S. and Canadian trade with other nations, including those in Central and South America, the Caribbean, and Asia. Some of this displacement would be expected to result in a loss of welfare associated with trade diversion—the shift from a lower-cost supplier to a higher-cost supplier. But because the displacement was expected to be small, it was projected to have a minor negative effect on the U.S. and Canadian economies.

To date, the effects of NAFTA on the U.S. economy have been relatively small. These effects have included increases in overall U.S. income and increases in U.S. trade with Mexico, but have had little impact on overall levels of unemployment, although with some displacement of workers from sector to sector. For particular industries or products with a greater exposure to intra-NAFTA trade, effects have generally been greater, including displacement effects on individual workers. Overall, studies have indicated that NAFTA has resulted in greater trade creation than trade diversion for the United States, thus improving its welfare.⁸

It is in politics, not economics, that NAFTA has had its biggest impact. The trade agreement has come to symbolize a close embrace between the United States and Mexico. Given the history of hostility between the two countries, this embrace is remarkable. U.S. officials realized that their chance of curbing the flow of illegal immigrants would be far greater if their southern neighbors were wealthy instead of poor. The United States bought itself an ally with NAFTA.

Modernizing NAFTA

Created in 1994, NAFTA was controversial from the start. Critics have characterized NAFTA as being unfair and a jobs destroyer while proponents maintain that the trade agreement has fostered increased trade and investment among Canada, Mexico, and the United States, resulting in economic growth. As a presidential candidate, Donald Trump referred to NAFTA as the worst trade deal maybe ever and said he would junk it. Yet as president of the United States, Trump relented, apparently recognizing that many of his voters rely on trade with Canada and Mexico. Therefore, in 2017 Trump entered into negotiations with the governments of Mexico and Canada to renegotiate the pact. Trump noted that the original NAFTA deal of the early 1990s was ill-fitted for the much changed economic environment of 2017.

Many analysts felt that a possible obstacle to a deal to modernize NAFTA was Trump's insistence that an upgraded NAFTA must reduce America's trade deficits with Canada and

⁸See Peterson Institute for International Economics, *NAFTA 20 Years Later*, Briefing No. 14–3, November 2014 and *A Path Forward for NAFTA*, Briefing No. 17–2, July 2017.

Mexico. Trump's critics noted that such a demand asks too much from Canada and Mexico which have sustained continuous trade deficits with the rest of the world, much like the United States. Moreover, America's overall balance of trade is ultimately determined by macroeconomic factors including investment and saving. Even if revising NAFTA were to reduce bilateral trade deficits with Mexico and Canada, unless America saves more, deficits with other countries would increase as discussed in Chapter 10 of this textbook.

At the writing of this textbook, negotiations on NAFTA were ongoing. Here are some of the issues that were being considered by negotiators.

- **Digital trade.** Digital trade refers to commerce in products and services delivered via the Internet. It blossomed following the implementation of NAFTA. An increasing share of cross-border commerce begins on a website or a smartphone, or relies on the Internet to produce and deliver goods and services. This has made it easier for small traders to sell across borders. An updating of NAFTA to establish clear rules and standards for digital trade would benefit the trading partners of the pact.
- **Energy.** The original NAFTA agreement eliminated or reduced tariffs and nontariff barriers to trade in energy products. Although the United States and Canada have fully integrated their energy sectors in terms of supply, transport, production, and distribution, Mexico has remained less engaged. A revised NAFTA would further promote private investment in Mexico's energy sector and foster cross-border integration.
- **Dispute settlement.** NAFTA includes impartial, rules-based dispute resolution mechanisms to provide the assurance of fairness and predictability that North American businesses need to engage in commercial exchanges. When disputes emerge, NAFTA directs those concerned to try to resolve their differences through NAFTA committees and working groups or through other consultations. If no mutually acceptable solution is found, NAFTA also provides for independent trade panels to help resolve disputes. Despite these procedures, all members of NAFTA have complained about the policing of NAFTA's provisions. For example, the United States, which feels that it has been hit with unfair trade rulings by the panels, has listed the modification or removal of the panels as a priority in negotiations to revise NAFTA.

At the writing of this textbook, it remained to be seen whether negotiators would be successful in revising a NAFTA pact that would be approved by the governments of the participating nations.

INTERNATIONAL TRADE APPLICATION

Free Trade Agreements Bolster Mexico's Competitiveness

For decades, the southern states of the United States have maintained economic appeal for foreign auto manufacturers. Firms such as Toyota, Honda, Nissan, BMW, and Volkswagen AG have chosen to locate assembly plants in states such as Tennessee, Alabama, Georgia, and South Carolina. Among the advantages of these states are the so-called right-to-work laws that do not require employees to join unions: Wages tend to be lower than in unionized, northern states. Also,



southern states have good transportation and energy infrastructures, which enhance the efficiency of auto manufacturing and distribution.

However, by 2015, the southern states realized that they had a new competitor, namely Mexico. Consider the case of Volkswagen AG whose Audi division was considering where it might build a North American assembly plant to manufacture its Q5 SUV. The firm decided to locate production in Mexico. Why?

(continued)

Mexico's low wages and improved logistics were part of its attractiveness. Also, the government of Mexico sweetened the deal by agreeing to donate land and finance a training center for Audi's Mexican workers. Yet for Audi, which produces vehicles for shipment throughout the world, the key attraction was Mexico's 40 different free trade agreements with auto-importing nations throughout Europe, Latin America, and the Asian Pacific region. The agreements provide exporters from Mexico duty-free access to markets that contain about three-fifths of the world's economic output.

The cost advantage resulting from a free trade agreement can be substantial. For example, when Audi's rival BMW AG produces autos in its South Carolina plant and then ships them to Europe, the import tariff on each auto

is 10 percent. For a \$50,000 auto, this duty amounts to \$5,000. This is a more significant factor than differences in labor costs. As a result, in 2015, BMW announced that it would establish a factory in Mexico, which would become a platform for selling autos throughout the world. Simply put, free trade agreements have bolstered the competitiveness of Mexico's auto industry.

What do you think? How have free trade agreements bolstered the competitiveness of Mexico's auto industry?

Sources: Dudley Althaus and William Boston, "Why Auto Makers Are Building New Factories in Mexico, Not the U.S.," *The Wall Street Journal*, March 18, 2015; Bruce Kennedy, "Four Auto Companies Benefiting from Mexico's Free Trade Agreements," August 21, 2014, at www.benzinga.com/news/; Justin Berkowitz, "Free-Trade Cars: Why a U.S.-Europe Free Trade Agreement Is a Good Idea," June 2013, at www.caranddriver.com.

U.S.–Mexico Trucking Dispute

Achieving an integrated North American market isn't as easy as it looks. Consider the conflict between free traders, who desire the efficiency of a deregulated trucking system, and social activists who express concerns about highway safety. Or is preservation of domestic jobs their real motive?

For decades, the safety of the North American trucking system has been of concern to Americans and Canadians. The United States and Canada have laws on their books limiting the number of consecutive hours a trucker can be on the road; truck drivers are tested for drug or alcohol use and trucks are inspected for safety requirements. In contrast, Mexico traditionally has maintained less stringent standards for its trucks and drivers. Mexico has no roadside inspection program or drug testing for drivers. It does not require logbooks or have weighing stations for trucks. It doesn't have a requirement for the labeling of hazardous or toxic cargo, or a system to verify drivers' licenses.

According to NAFTA, the United States, Mexico, and Canada agreed to open their roads to each other's cargo trucks. In 1995, on the day before NAFTA's cross-border trucking provision was to begin, President Bill Clinton imposed restrictions on Mexican cargo trucks, citing trucking safety as his concern. Mexican trucks entering the United States were limited to a commercial zone within 25 miles of the Mexican border. Mexican goods transported into the United States beyond this commercial zone had to be loaded onto American trucks, a practice that pleased the U.S. Teamsters (truckers) union. In 2002, the U.S. government introduced 22 additional safety requirements that Mexican trucks would have to meet if they eventually received authority to travel throughout the United States. This measure went beyond the requirements that were applied to U.S. and Canadian trucks operating in the United States.

Feeling shut out of the U.S. transportation market, Mexico responded by protesting the trucking restrictions to a NAFTA arbitration panel that ruled that the United States was in violation of its NAFTA obligations. The result was an agreement in 2007 that established a pilot program that allowed a limited number of Mexican cargo trucks to travel throughout the United States under rigid safety regulations. After 18 months, the program proved that Mexican trucks and drivers were as safe as their U.S. and Canadian counterparts and that

transportation cost savings provided benefits for American consumers. That was bad news for the Teamsters union, and it placed political pressure on Congress to cancel the pilot program.

In 2009, the U.S. government terminated the pilot program, closing the southern border of the United States to Mexican cargo trucks. Mexico retaliated by releasing a list of 99 U.S. products that would face tariffs of 10 to 45 percent. Among the states hit hardest by Mexico's tariffs were California, Oregon, and Washington, which exported a variety of agricultural products to Mexico. With the cost of imported American products higher, Mexicans substituted these products with goods from Latin America, Europe, and Canada. Clearly, American agricultural producers paid a dear price for the protectionism granted to the Teamsters union. This led to American agriculture producers and their allies protesting these tariffs to President Barack Obama, demanding the trucking dispute be resolved.

In 2011, the governments of Mexico and the United States announced a deal to end the trucking conflict. Under the deal, Mexico agreed to end its tariffs applied to U.S. goods, and in return, its trucks were allowed to travel throughout the United States. Stringent regulations were placed on Mexican trucks and drivers entering the United States. Mexican trucks have to carry recorders to ensure they do only cross border, not domestic runs, and track compliance with U.S. hours-of-service laws. These requirements are tougher than those established by NAFTA and somewhat tougher than those in force for American truckers. Analysts generally maintained that the number of Mexican trucks traveling deep into the United States would be modest in the first several years following the deal.

U.S.–Mexico Tomato Dispute

Another dispute between Mexico and the United States involves tomatoes.⁹ The enactment of the NAFTA agreement in 1994 abolished American tariffs on Mexican products, including tomatoes. As competition intensified, American tomato growers accused Mexican growers of selling their tomatoes in the United States at prices less than fair value (dumping) and driving American growers out of business. The Americans petitioned for the levying of antidumping tariffs on Mexican tomatoes. The Mexican government contended that Mexican tomatoes were not sold in the United States at prices below fair value: Mexican-grown tomatoes were more competitive due to superior technology, good weather, and lower labor costs. It would be unfair to punish Mexican growers for their competitiveness according to the Mexican government.

To resolve this dispute, an agreement was reached in 1996 in which Mexico's largest growers placed a floor on the price of their tomatoes sold in the United States so they would not undercut American growers. The price floor was set at 17 cents per pound during summer months and 21 cents per pound during the winter. For the price floor to be effective, growers representing 85 percent of Mexico's tomato exports agreed to adhere to the minimum. In return, the United States agreed to refrain from enacting antidumping duties.

The minimum price agreement fulfilled the American growers' objective of preventing Mexican tomatoes from being exported to the United States at prices less than fair value. Analysts who studied the matter concluded that the agreement did not eliminate foreign competition for America's tomato growers. Why? When the price floor was in effect, Mexico exported more tomatoes to Canada while Canada and the rest of the world increased their tomato sales in the United States, thereby lessening the restrictive effect of the Mexican price floor.

⁹Cathy Baylis and Jeffrey Perloff, *End Runs around Trade Restrictions: The Case of the Mexican Tomato Suspension Agreements*, Giannini Foundation of Agricultural Economics, 2005; Richard Lopez, "Tomato Prices to Rise if U.S.-Mexico Trade Agreement Ends, Study Says," *Los Angeles Times*, January 24, 2013; and Stephanie Strom, "United States and Mexico Reach Tomato Deal, Averting a Trade War," *The New York Times*, February 3, 2013.

During 2012–2013, American tomato growers lobbied for the termination of the price floor agreement, maintaining that they could not compete at the low prices set by the agreement. If the agreement would be abolished, they would be free to again petition the U.S. government to impose more restrictive antidumping tariffs that would result in Mexican tomatoes being sold in the United States at prices higher than those set by the price floor agreement.

In 2013 the United States and Mexico reached a new agreement on trade in tomatoes. The agreement increased the minimum sales price for Mexican tomatoes in the United States from 21 cents per pound to 31 cents for winter tomatoes, and for summer tomatoes from 17 cents per pound to 24.6 cents. The agreement increased the types of tomatoes covered by the pact to include all Mexican growers and exporters. Although the low-cost growers of Mexico were not pleased that the price floor was raised, they recognized that the agreement restored stability to the American tomato market and therefore avoided a more costly trade war.

Is NAFTA an Optimal Currency Area?

The increasing convergence of the NAFTA countries has stimulated a debate on the issues of adopting a common currency and forming an American monetary union among Canada, Mexico, and the United States. Of central relevance to the economic suitability of such a monetary union is the concept of the optimal currency area, as discussed in this chapter.

According to the theory of optimal currency areas, the greater the linkages between countries, the more suitable it is for them to adopt a single official currency. One such linkage is the degree of economic integration among the three NAFTA members. As expected, trade within NAFTA is quite substantial. Canada and Mexico rank as the first and second, respectively, largest trading partners of the United States in terms of trade turnover (imports plus exports). Likewise, the United States is the largest trading partner of Canada and Mexico.

Another linkage is the similarity of economic structures among the three NAFTA members. Canada's advanced industrial economy resembles that of the United States. In the past decade, Canada's average real income per capita, inflation rate, and interest rate were very close to those of the United States. Mexico is a growing economy that is aspiring to maintain economic and financial stability with a much lower average real income per capita and significantly higher inflation and interest rates compared with those of Canada and the United States. The value of the peso relative to the U.S. dollar has been quite volatile, although the peso has been more stable against the Canadian dollar. Other problems endured by Mexico are high levels of external debt, balance of payments deficits, and weak financial markets.

Some analysts are skeptical of whether Mexico's adoption of the U.S. dollar as its official currency would be beneficial. If Mexico adopted the dollar, its central bank would be unable to use monetary policy to impact production and employment in the face of economic shocks that might further weaken its economy. However, adopting the dollar would offer Mexico several advantages, including the achievement of long-term credibility in Mexican financial markets, long-term monetary stability and reduced interest rates, and increased discipline and confidence as a result of reducing inflation to U.S. levels. Most observers feel that the case for Mexican participation in a North American optimal currency area is questionable on economic grounds. The Mexican government has shown interest in dollarizing its economy in an attempt to develop stronger political ties to the United States.

Canadians have generally expressed dissatisfaction concerning adoption of the U.S. dollar as their official currency. In particular, Canadians are concerned about the loss of national sovereignty that such a policy would entail. They also note that there is no added benefit of credibility to monetary and fiscal discipline, since Canada, like the

United States, is already committed to achieving low inflation, low interest rates, and a low level of debt relative to gross domestic product. The case for Canadian participation in any North American currency area is less strong on political grounds than economically. At the writing of this text, the likelihood of a North American currency area in the near term appeared to be dim.

INTERNATIONAL TRADE APPLICATIONS

A Trans-Pacific Partnership?

On his first day in office in January, 2017, President Donald Trump signed an executive order removing the United States from the proposed Trans-Pacific Partnership (TPP). This marked the first time the United States has abandoned a trade agreement that it initially supported. Trump emphasized that he was preventing trade deals that have taken companies out of the United States, resulting in job losses for American workers. Trump also indicated that, in the future, he would sign bilateral trade deals only with individual nations, and such deals would result in a lot of companies coming back to the United States. Let us consider the TPP and the implications of the U.S. withdrawal.



After five days of intense round-the-clock talks, on October 5, 2015, trade negotiators reached the Trans-Pacific Partnership (TPP) trade deal, which was ratified by governments of the participating nations in March, 2018. The TPP was the product of 10 years of negotiations and was desired by President Barack Obama who sought a foreign policy link to the Pacific Rim.

The TPP is a trade liberalization agreement among the United States and 11 other Pacific Rim countries: Japan, Vietnam, Malaysia, Singapore, Brunei, Australia, New Zealand, Canada, Mexico, Peru, and Chile. This group of nations has an annual gross domestic product (GDP) of some \$28 trillion, which represents about 40 percent of global GDP and one-third of world trade.

Not showing interest in joining the negotiations, China was suspicious of the pact, viewing it as a potential threat as the United States attempted to tighten its ties to Asian trading partners. Also, China could not be part of this deal, which did not allow government-owned companies to have special privileges, because China is currently dominated by state-owned enterprises.

The goal of the agreement is to enhance trade and investment among the partner nations; to promote

innovation, economic growth, and development; and to support the creation and retention of jobs through lower trade barriers. The United States considered the TPP as a companion agreement to the proposed Transatlantic Trade and Investment Partnership, a similar agreement between the United States and the European Union.

Supporters maintained that the TPP would benefit all the participating countries and that it is written so as to encourage additional countries, possibly even China, to sign on. However, opponents in the United States considered the pact as mostly a giveaway to business, encouraging additional exporting of manufacturing jobs to low-wage nations, while restricting competition and promoting higher prices for prescription drugs and other high-value products by spreading American standards to patent protections to other countries.

Trump's policy of abandoning the TPP upended a free-trade strategy adopted by presidents of the Republican and Democratic parties dating back to the 1960s. It positioned him more with the political left, including labor unions. However, some in both parties worried that China would move to fill the economic vacuum as America looks inward, and would increase its influence over Asia and elsewhere. Will Trump reconsider his abandonment decision in the future?

What do you think? If you were a member of Congress, would you ratify the TPP?

Sources: Peter Baker, "Trump Abandons Trans-Pacific Partnership, Obama's Signature Trade Deal," *The New York Times*, January 23, 2017; Brock Williams, *Trans-Pacific Partnership (TPP) Countries: Comparative Trade and Economic Analysis*, Congressional Research Service, June 20, 2013; William Mauldin, "U.S. Reaches Trans-Pacific Partnership Trade Deal with 11 Pacific Nations," *The Wall Street Journal*, October 5, 2015; Devin Granville, "The Trans-Pacific Partnership Trade Deal Explained," *The New York Times*, October 5, 2015; "In Size and Stakes, the Trans-Pacific Partnership Is a Big Deal," *PBS NewsHour*, October 5, 2015.

INTERNATIONAL TRADE APPLICATIONS

A U.S.–China Free Trade Agreement?

The United States and China are the world's two largest economies, and their trade and investment linkages are expanding. Although the two countries have sought to cooperate on many topics regarding trade, finance, and the environment, they disagree on a number of issues. For example, they often take each other to the World Trade Organization, where they squabble over tariffs applied to automobile tires, export restrictions on rare earth minerals, and illegal dumping of wood furniture. Mistrust often characterizes the relationship of the two countries.



Many observers maintain that the economic landscape between China and the United States needs to improve. One way of achieving this is by negotiating a bilateral free trade and investment agreement between the two countries. Although such an agreement is unlikely to occur in the near future, there are several reasons to support one.

- There are significant economic gains that could be attained when each country expands the sectors of its comparative advantage. Because these sectors pay wages above the national average, employment would tend to shift in this direction. Also, consumers would benefit from a cheaper and more diversified selection of goods and services.
- Economic reform in both countries would be encouraged by a free trade and investment agreement. The U.S. economy would move in the direction of more investment and exports, while China would move toward more consumption and services.
- The rules of the WTO do not adequately address many issues of disagreement between China and the United States, such as the dollar–yuan exchange rate, the role of state-owned enterprises, the protection of intellectual property rights, and commercial cyberespionage. A comprehensive trade and investment pact between China and the United States could address these topics and thus decrease the risk of conflict between the two superpowers.

However, there are a number of obstacles that would have to be resolved before China and the United States could seriously consider negotiating a trade and investment agreement. Here are some of them:

- A free trade agreement could result in adjustment burdens for China and the United States. For example, job losses and wage reductions would likely occur for Americans

that compete with manufactured goods that are imported from China. For China, disruptions would take place in agriculture and the service sector that compete against the United States.

- The economic relationship between the two countries is quite unbalanced. The world's largest deficit and debtor nation is the United States, and most of its imbalance is with China. China is a major surplus country, and most of it is with the United States. These imbalances contribute to the unwillingness of the United States to liberalize trade with China.
- The United States is an economically advanced country and China is a developing economy. China maintains that the differences in levels of development between the two countries justifies its opposition to standards that the United States requires in all of its trade negotiations, such as protection of the environment and workers' rights.
- A lack of trust between the two countries may be the most important issue of all. Many Americans feel that China is trying to achieve world domination at the expense of the United States. Many Chinese feel that the United States desires to limit their economic and political influence in the world. Over time, such mistrust can result in antagonistic relations between these super powers.

Proponents of a U.S.–China bilateral free trade agreement note that a number of countries have already implemented or launched negotiations on free trade agreements with China, including Japan, South Korea, Australia, and New Zealand, which is all the more reason not to wait any longer to improve the relationship between the United States and China.

What do you think? Do you feel that the United States and China are close to entering into discussions for a free trade agreement?

Sources: C. F. Bergsten, G. C. Hufbauer, and S. Miner, *Bridging the Pacific*, Peterson Institute for International Economics, Washington, DC, 2014; H. Kissinger, "The United States-China Relationship," in ed. Andrew Sheng, *Finance, Development, and Reform* (Beijing, China: Citic Press, 2014); K. Lieberthal and W. Jisi, *Addressing US-China Strategic Distrust*, Brookings Institution, Washington, DC, 2012.

SUMMARY

- Trade liberalization has assumed two main forms. One involves the reciprocal reduction of trade barriers on a nondiscriminatory basis, as seen in the operation of the World Trade Organization. The other approach involves the establishment by a group of nations of regional trading arrangements among themselves. The European Union and the North American Free Trade Agreement are examples of regional trading arrangements.
- The term *economic integration* refers to the process of eliminating restrictions on international trade, payments, and factor input mobility. The stages of economic integration are (a) free trade area, (b) customs union, (c) common market, (d) economic union, and (e) monetary union.
- The welfare implications of economic integration can be analyzed from two perspectives. First are the static welfare effects, resulting from trade creation and trade diversion. Second are the dynamic welfare effects that stem from greater competition, economies of scale, and the stimulus to investment spending that economic integration makes possible.
- From a static perspective, the formation of a customs union yields net welfare gains if the consumption and production benefits of trade creation more than offset the loss in world efficiency owing to trade diversion.
- Several factors influence the extent of trade creation and trade diversion: (a) the degree of competitiveness that member nation economies have prior to formation of the customs union, (b) the number and size of its members, and (c) the size of its external tariff against nonmembers.
- The European Union was originally founded in 1957 by the Treaty of Rome. Today it consists of 27 members. By 1992, the EU had essentially reached the common market stage of integration. Empirical evidence suggests that the EU has realized welfare benefits in trade creation that have outweighed the losses from trade diversion. One of the stumbling blocks confronting the EU has been its common agricultural policy that has required large government subsidies to support European farmers. The Maastricht Treaty of 1991 called for the formation of a monetary union for eligible EU members that was initiated in 1999.
- The formation of the European Monetary Union in 1999 resulted in the creation of a single currency (the euro) and a European Central Bank. With a common central bank, the central bank of each participating nation performs operations similar to those of the 12 regional Federal Reserve Banks in the United States.
- Much of the analysis of the benefits and costs of Europe's common currency is based on the theory of optimal currency areas. According to this theory, the gains to be had from sharing a currency across countries' boundaries include more uniform prices, lower transactions costs, increased certainty for investors, and enhanced competition. These gains must be compared against the loss of an independent monetary policy and the option of changing the exchange rate.
- In 1989, the United States and Canada successfully negotiated a free trade agreement under which free trade between the two nations would be phased in over a ten-year period. This agreement was followed by negotiation of the North American Free Trade Agreement by the United States, Mexico, and Canada.
- By the 1990s, nations of Eastern Europe and the former Soviet Union were taking steps to move from centrally planned economies toward market economies. These transitions reflected the failure of central planning systems to provide either political freedom or a decent standard of living.
- It is widely agreed that the transition of the economies of Eastern Europe and the former Soviet Union into healthy market economies will require major restructuring: (a) establishing sound fiscal and monetary policies; (b) removing price controls; (c) opening economies to competitive market forces; (d) establishing private property rights and a legal system to protect those rights; and (e) reducing government's involvement in the economy.

KEY CONCEPTS AND TERMS

Benelux (p. 279)

Brexit (p. 290)

Common agricultural policy (p. 286)

Common market (p. 279)

Convergence criteria (p. 285)

Customs union (p. 279)

Dynamic effects of economic integration (p. 281)

Economic integration (p. 279)

Economic union (p. 280)
 Euro (p. 285)
 European Monetary Union (EMU) (p. 285)
 European Union (EU) (p. 279)
 Export subsidies (p. 286)
 Free trade area (p. 279)

Maastricht Treaty (p. 285)
 Monetary union (p. 280)
 North American Free Trade Agreement (NAFTA) (p. 298)
 Optimal currency area (p. 293)
 Regional trading arrangement (p. 277)

Static effects of economic integration (p. 281)
 Trade creation effect (p. 281)
 Trade diversion effect (p. 281)
 Variable levies (p. 286)

STUDY QUESTIONS

- How can trade liberalization exist on a nondiscriminatory basis versus a discriminatory basis? What are some actual examples of each?
- What is meant by the term *economic integration*? What are the various stages that economic integration can take?
- How do the static welfare effects of trade creation and trade diversion relate to a nation's decision to form a customs union? Of what importance to this decision are the dynamic welfare effects?
- Why has the so-called common agricultural policy been a controversial issue for the European Union?
- What are the welfare effects of trade creation and trade diversion for the European Union, as determined by empirical studies?
- Table 8.6 depicts the supply and demand schedules of gloves for Portugal, a small nation that is unable to affect the world price. On graph paper, draw the supply and demand schedules of gloves for Portugal.
 - Assume that Germany and France can supply gloves to Portugal at a price of \$2 and \$3, respectively. With free trade, which nation exports gloves to Portugal? How many gloves does Portugal produce, consume, and import?
 - Suppose Portugal levies a 100 percent nondiscriminatory tariff on its glove imports. Which nation exports gloves to Portugal? How many gloves will Portugal produce, consume, and import?

TABLE 8.6

Supply and Demand for Gloves: Portugal

Price (\$)	Quantity Supplied	Quantity Demanded
0	0	18
1	2	16
2	4	14
3	6	12
4	8	10
5	10	8
6	12	6
7	14	4
8	16	2
9	18	0

- Suppose Portugal forms a customs union with France. Determine the trade creation effect and the trade diversion effect of the customs union. What is the customs union's overall effect on the welfare of Portugal?
- Suppose instead that Portugal forms a customs union with Germany. Is this a trade diverting or trade creating customs union? By how much does the customs union increase or decrease the welfare of Portugal?

EXPLORING FURTHER

For a discussion of government procurement policy and the European Union, go to *Exploring Further 8.1*, which can be found in MindTap.

For an analysis of the effects of economies of scale in manufacturing, go to *Exploring Further 8.2*, which can be found in MindTap.

International Factor Movements and Multinational Enterprises



Our attention so far has been on the international flow of goods and services. However, some of the most dramatic changes in the world economy have been due to the international flow of factors of production, comprising labor and capital. In the 1800s, European capital and labor (along with African and Asian labor) flowed to the United States and fostered its economic development. In the 1960s, the United States sent large amounts of investment capital to Canada and Western Europe; in the 1980s and 1990s, investment flowed from Japan to the United States. Today, workers from southern Europe find employment in northern European factories, while Mexican workers migrate to the United States. The tearing down of the Berlin Wall in 1990 triggered a massive exodus of workers from East Germany to West Germany.

The economic forces underlying the international movement in factors of production are virtually identical to those underlying the international flow of goods and services. Productive factors move when they are permitted to from nations where they are abundant (low productivity) to nations where they are scarce (high productivity). Productive factors flow in response to differences in returns (such as wages and yields on capital) as long as these are large enough to more than outweigh the cost of moving from one country to another.

This chapter considers the role of international capital flows (investment) as a substitute for trade in capital-intensive products. Special attention is given to the multinational enterprise that carries on the international reallocation of capital. The chapter also analyzes the international mobility of labor as a substitute for trade in labor-intensive products.

The Multinational Enterprise

Although the term *enterprise* can be precisely defined, there is no universal agreement on the exact definition of a **multinational enterprise (MNE)**. A close look at some representative MNEs suggests that these businesses have a number of identifiable features.

Operating in many host countries, MNEs often conduct research and development (R&D) activities in addition to manufacturing, mining, extraction, and business/service operations. The MNE cuts across national borders and is often directed from a company planning center that is distant from the host country. Both stock ownership and company management are usually multinational in character. A typical MNE has a high ratio of foreign sales to total sales, often 25 percent or more. Regardless of the lack of agreement as to what constitutes an MNE, there is no doubt that the multinational phenomenon is massive. Table 9.1 provides a glimpse of some of the world's largest corporations.

TABLE 9.1**The World's Largest Corporations, 2016**

Firm	Headquarters	Revenues (\$ billions)
Walmart Stores	United States	482.1
State Grid	China	329.6
China National Petroleum	China	299.3
Sinopec Group	China	294.3
Royal Dutch Shell	Netherlands	272.1
Exxon Mobil	United States	246.2
Volkswagen	Germany	236.6
Toyota Motor	Japan	236.6
Apple	United States	233.7
BP	United Kingdom	226.0

Source: From "The 2016 Global 500," *Fortune*, available at <http://www.fortune.com>.

Multinationals may diversify their operations along vertical, horizontal, and conglomerate lines within the host and source countries. **Vertical integration** often occurs when the parent MNE decides to establish foreign subsidiaries to produce intermediate goods or inputs that go into the production of a finished good. For industries such as oil refining and steel, such *backward integration* may include the extraction and processing of raw materials. Most manufacturers tend to extend operations backward only to the production of component parts. The major international oil companies represent a classic case of backward vertical integration on a worldwide basis. Oil production subsidiaries are located in areas such as the Middle East, whereas the refining and marketing operations occur in the industrial nations of the West. Multinationals may also practice *forward integration* in the direction of the final consumer market. Automobile manufacturers may establish foreign subsidiaries to market the finished goods of the parent company. In practice, most vertical foreign investment is backward. Multinationals often wish to integrate their operations vertically to benefit from economies of scale and international specialization.

Horizontal integration occurs when a parent company producing a commodity in the source country sets up a subsidiary to produce an identical product in the host country. These subsidiaries are independent units in productive capacity and are established to produce and market the parent company's product in overseas markets. Coca-Cola and Pepsi-Cola are bottled not only in the United States but also throughout much of the world. Multinationals sometimes locate production facilities overseas to avoid stiff foreign tariff barriers that would place their products at a competitive disadvantage. Parent companies

also like to locate close to their customers because differences in national preferences may require special designs for their products.

Besides making horizontal and vertical foreign investments, MNEs may diversify into nonrelated markets in what is known as **conglomerate integration**. In the 1980s, U.S. oil companies stepped up their nonenergy acquisitions in response to anticipated declines of the future investment opportunities for oil and gas. ExxonMobil acquired a foreign copper mining subsidiary in Chile, and Tenneco bought a French company producing automotive exhaust systems.

To carry out their worldwide operations, MNEs rely on **foreign direct investment**—acquisition of a controlling interest in an overseas company or facility. Foreign direct investment typically occurs when (1) the parent company obtains sufficient common stock in a foreign company to assume voting control (the U.S. Department of Commerce defines a company as directly foreign owned when a “foreign person” holds a 10 percent interest in the company); (2) the parent company acquires or constructs new plants and equipment overseas; (3) the parent company shifts funds abroad to finance an expansion of its foreign subsidiary; or (4) earnings of the parent company’s foreign subsidiary are reinvested in plant expansion.

Table 9.2 summarizes the position of the United States with respect to foreign direct investment in 2015. Data are provided concerning U.S. direct investment abroad and foreign direct investment in the United States. In recent years, the majority of U.S. foreign direct investment has flowed to Europe, Latin America, and Canada, especially in the manufacturing sector. Most foreign direct investment in the United States has come from Europe, Canada, and Asia—areas that have invested heavily in U.S. manufacturing, petroleum, and wholesale trade facilities.

TABLE 9.2**Direct Investment Position of the United States on a Historical Cost Basis, 2015***

Country	U.S. DIRECT INVESTMENT ABROAD		FOREIGN DIRECT INVESTMENT IN U.S.	
	Amount (billions of dollars)	Percentage	Amount (billions of dollars)	Percentage
Canada	352.9	7.0	269.0	8.6
Europe	2,949.2	58.5	2,162.8	69.0
Latin America	847.6	16.8	118.8	3.8
Africa	64.0	1.3	0.7	0.0
Middle East	48.5	1.0	18.5	0.1
Asia and Pacific	<u>778.3</u>	<u>15.4</u>	<u>564.4</u>	<u>18.5</u>
	5,040.5	100.0	3,134.2	100.0

*Historical cost valuation is based on the time the investment occurred, with no adjustment for price changes.

Source: From U.S. Department of Commerce, *U.S. Direct Investment Position Abroad and Foreign Direct Investment Position in the United States on a Historical-Cost Basis*, available at <http://www.bea.doc.gov/>. See also U.S. Department of Commerce, *Survey of Current Business*, Washington, DC, Government Printing Office.

Motives for Foreign Direct Investment

The case for opening markets to foreign direct investment is as compelling as it is for trade. More open economies enjoy higher rates of private investment that is a major determinant of economic growth and job creation. Foreign direct investment is actively courted by countries, because it generates spillovers such as improved management and better

technology. As is true with firms that trade, firms and sectors in which foreign direct investment is intense tend to have higher average labor productivity and pay higher wages. Outward investment allows firms to remain competitive and supports employment at home. Investment abroad stimulates exports of machinery and other capital goods.

New MNEs do not pop up haphazardly in foreign nations; they develop as a result of conscious planning by corporate managers. Both economic theory and empirical studies support the idea that foreign direct investment is conducted in anticipation of *future profits*. It is generally assumed that investment flows from regions of low anticipated profit to those of high anticipated profit after allowing for risk. Although expected profits may ultimately explain the process of foreign direct investment, corporate management may emphasize a variety of other factors when asked about their investment motives. These factors include market demand conditions, trade restrictions, investment regulations, labor costs, and transportation costs. All these factors have a bearing on cost and revenue conditions and hence on the level of profit.

Demand Factors

The quest for profits encourages MNEs to search for new markets and sources of demand. Some MNEs set up overseas subsidiaries to tap foreign markets that cannot be maintained adequately by export products. This set up sometimes occurs in response to dissatisfaction over distribution techniques abroad. Consequently, a business may set up a foreign marketing division and, later, build manufacturing facilities. This incentive may be particularly strong with the realization that local taste and design differences exist. A close familiarity with local conditions is of utmost importance to a successful marketing program.

The location of foreign manufacturing facilities may be influenced by the fact that some parent companies find their productive capacity already sufficient to meet domestic demands. If they wish to enjoy growth rates that exceed the expansion of domestic demand, they must either export or establish foreign production operations. General Motors (GM) has felt that the markets of such countries as the United Kingdom, France, and Brazil are strong enough to permit the survival of GM manufacturing subsidiaries. Boeing has centralized its manufacturing operations in the United States and exports abroad because an efficient production plant for jet planes is a large investment relative to the size of most foreign markets.

Market competition may also influence a firm's decision to set up foreign facilities. Corporate strategies may be defensive in nature if they are directed at preserving market shares from actual or potential competition. The most certain method of preventing foreign competition from becoming a strong force is to acquire foreign businesses. For the United States, the 1960s and early 1970s witnessed a tremendous surge in the acquisition of foreign businesses. Approximately half of the foreign subsidiaries operated by U.S. MNEs were originally acquired through the purchase of existing concerns during this era. GM exemplifies this practice, purchasing and setting up auto producers around the globe. General Motors has been successful in gaining control of many larger foreign model firms, including Monarch (GM Canada) and Opel (GM Germany). It did not acquire smaller model firms such as Toyota, Datsun, and Volkswagen, all of which have become significant competitors for General Motors.

Cost Factors

Multinationals often seek to increase profit levels through reductions in production costs. Such cost-reducing foreign direct investments may take a number of forms. The pursuit of essential raw materials may underlie a company's intent to go multinational. This is particularly true of the extractive industries and certain agricultural commodities. United

Fruit has established banana-producing facilities in Honduras to take advantage of the natural trade advantages afforded by the weather and growing conditions. Similar types of natural trade advantages explain why Anaconda has set up mining operations in Bolivia and Shell produces and refines oil in Indonesia. Natural supply advantages such as resource endowments or climatic conditions may indeed influence a company's decision to invest abroad.

Production costs include factors other than material inputs, notably labor. *Labor costs* tend to differ among national economies. Multinationals may be able to hold costs down by locating part or all of their productive facilities abroad. Many U.S. electronics firms have had their products produced or at least assembled abroad to take advantage of cheap foreign labor. (The mere fact that the United States may pay higher wages than those prevailing abroad does not necessarily indicate higher costs. High wages may result from U.S. workers being more productive than their foreign counterparts. Only when high U.S. wages are not offset by superior U.S. labor productivity will foreign labor become more attractive.)

Multinational location can also be affected by transportation costs, especially in industries where transportation costs are a high fraction of product value. When the cost of transporting raw materials used by an MNE is significantly higher than the cost of shipping its finished products to markets, the MNE will generally locate production facilities closer to its raw material sources than to its markets; lumber, basic chemicals, aluminum, and steel are among the products that fit this description. Conversely, when the cost of transporting finished products is significantly higher than the cost of transporting the raw materials that are used in their manufacture, MNEs locate production facilities close to their markets. Beverage manufacturers such as Coca-Cola and Pepsi-Cola transport syrup concentrate to plants all over the world that add water to the syrup, bottle it, and sell it to consumers. When transportation costs are a minor fraction of product value, MNEs tend to locate where the availability and cost of labor and other inputs provide them the lowest manufacturing cost. Multinationals producing electronic components, garments, and shoes offer examples of this process.

Government policies may also lead to foreign direct investment. Some nations seeking to lure foreign manufacturers to set up employment-generating facilities in their countries may grant subsidies such as preferential tax treatment or free factory buildings to MNEs. More commonly, direct investment may be a way of circumventing import tariff barriers. The high tariffs that Brazil levies on auto imports means foreign auto producers wishing to sell in the Brazilian market must locate production facilities in that country. Another example is the response of U.S. business to the formation of the EU that imposed common external tariffs against outsiders while reducing trade barriers among member nations. American companies were induced to circumvent these barriers by setting up subsidiaries in the member nations. Japanese businesses that located additional auto assembly plants in the United States in the 1980s and 1990s defused mounting protectionist pressures.

Supplying Products to Foreign Buyers: Whether to Produce Domestically or Abroad

Once a firm knows that foreign demand for its goods exists, it must ascertain the lowest cost method of supplying these goods abroad. Suppose Anheuser-Busch (A-B) of the United States wants to sell its Budweiser beer in Canada. Anheuser considers the following: (1) build a brewery in Wisconsin to produce Bud for sale to U.S. consumers in the Upper Midwest and also to Canadian consumers (direct exporting); (2) build a brewery in Canada to produce Bud and sell it to Canadian consumers (foreign direct investment); or (3) license the rights to a Canadian brewery to produce and market Bud in Canada. The method A-B

chooses depends on the extent of economies of scale, transportation and distribution costs, and international trade barriers. These considerations are discussed in the following sections.

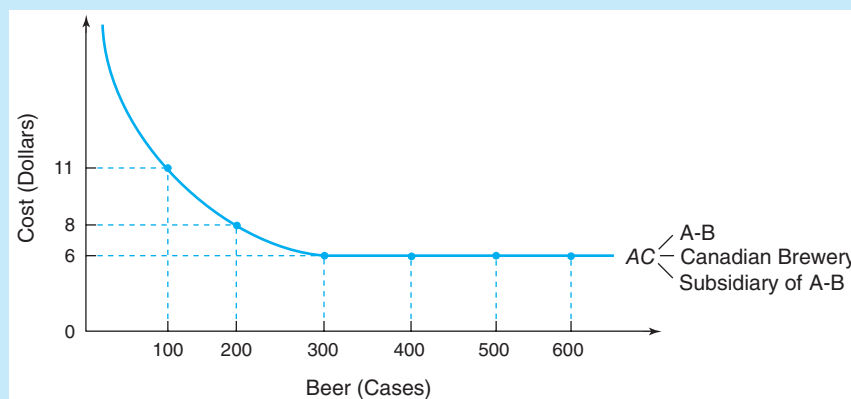
Direct Exporting versus Foreign Direct Investment/Licensing

Let us consider A-B's strategy of supplying Bud to Canadians via direct exporting as opposed to foreign direct investment or a licensing agreement. We will first analyze the influence of economies of scale on this strategy. One would expect economies of scale to encourage A-B to export Bud to Canada when the quantity of beer demanded in Canada is relatively small, and to encourage Canadian production via either a licensing agreement or foreign direct investment when a large quantity of beer is demanded.

To illustrate this principle, assume that average production cost curves are identical for A-B's potential brewery in Wisconsin, A-B's potential brewery in Canada, and a Canadian brewery that could be licensed to produce Bud. These cost curves are denoted by AC in Figure 9.1. As these breweries increase output, the average costs of producing a case of beer decrease up to a point, after which average costs no longer decrease but stabilize.

FIGURE 9.1

The Choice between Direct Exporting and Foreign Direct Investment/Licensing



When the Canadian market's size is large enough to permit efficient production in Canada, a U.S. firm increases profits by establishing a Canadian production subsidiary or licensing the rights to a Canadian firm to produce and market its product in Canada. The U.S. firm increases profits by exporting its product to Canada when the Canadian market is too small to permit efficient production.

Suppose A-B estimates that U.S. consumers will demand 200 cases of Bud per year, as shown in Figure 9.1. Producing this quantity at A-B's Wisconsin brewery allows the realization of sizable economies of scale that result in a production cost of \$8 per case. Also assume that Canadians are estimated to demand a relatively small quantity of Bud, say 100 cases. Because the Wisconsin brewery already produces 200 cases for U.S. consumption, increasing output to meet the extra demand in Canada permits the brewery to slide down its average cost curve until it produces 300 cases at a cost of \$6 per case.

The alternative to producing Bud in Wisconsin and exporting it to Canada is to produce it in Canada. Because Canadian consumers are estimated to demand only 100 cases of Bud, the size of the market is too small to allow economies of scale to be fully realized. A-B's potential brewery in Canada or the licensed Canadian brewer would produce Bud at a cost of \$11 per case. The production cost saving for A-B of brewing Bud in Wisconsin and exporting it to Canada is \$5 per case ($\$11 - \$6 = \5). If the cost of transporting and distributing Bud to Canadians is less than this amount, A-B would maximize profits by exporting Bud to Canada.

If the quantity of Bud demanded in Canada exceeds 300 cases, it might be more profitable for A-B to use a licensing agreement or foreign direct investment. To illustrate this possibility, refer to Figure 9.1. Suppose that Canadians are estimated to demand 400 cases of Bud per year, whereas the quantity of Bud demanded by U.S. consumers remains at 200 cases. With economies of scale exhausted at 300 cases, the larger Canadian demand does not permit A-B to produce Bud at a cost lower than \$6 per case. By producing 400 cases, the licensed Canadian brewery or the Canadian subsidiary brewery of A-B could match the efficiency of A-B's Wisconsin brewery and each would realize a production cost of \$6 per case. Given equal production costs, A-B minimizes total cost by avoiding the additional cost of transporting and distributing beer to Canadians. Thus, A-B increases profits by either licensing its beer technology to a Canadian brewer or investing in a brewing subsidiary in Canada.

Similar to transportation costs, trade restrictions can neutralize production cost advantages. If Canada has high import tariffs the production cost advantage of A-B's Wisconsin brewery may be offset, so that foreign direct investment or licensing is the only feasible way of penetrating the Canadian market.

Foreign Direct Investment versus Licensing

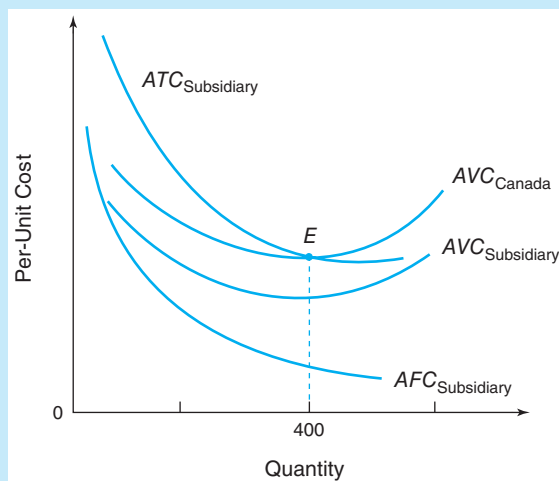
Once a firm chooses foreign production as a method of supplying goods abroad, it must decide whether it is more efficient to establish a foreign production subsidiary or license the technology to a foreign firm to produce its goods. In the United Kingdom, there are Kentucky Fried Chicken establishments that are owned and run by local residents. The parent U.S. organization merely provides its name and operating procedures in return for royalty fees paid by the local establishments. Although licensing is widely used in practice, it presupposes that local firms are capable of adapting their operations to the production process or technology of the parent organization.

Figure 9.2 portrays the hypothetical cost conditions confronting A-B as it contemplates whether to license Bud production technology to a Canadian brewery or invest in a Canadian brewing subsidiary. Curve $AVC_{\text{Subsidiary}}$ represents the average variable cost (such as labor and materials) of A-B's brewing subsidiary, and AVC_{Canada} represents the average variable cost of a Canadian brewery. The establishment of a foreign brewing subsidiary also entails fixed costs denoted by curve $AFC_{\text{Subsidiary}}$. These include the expenses of coordinating the subsidiary with the parent organization and the sunk costs of assessing the market potential of the foreign country. The total unit costs that A-B faces when establishing a foreign subsidiary are given by $ATC_{\text{Subsidiary}}$.

Comparing $ATC_{\text{Subsidiary}}$ with AVC_{Canada} , for a relatively small market of less than 400 cases of beer, the Canadian brewery has an absolute cost advantage. Licensing Bud production technology to a Canadian brewery in this case is more profitable for A-B. If the Canadian market for Bud exceeds 400 cases, A-B's brewing subsidiary has an absolute cost advantage; A-B increases profits by supplying beer to Canadians via foreign direct investment.

FIGURE 9.2

The Choice between Foreign Direct Investment and Licensing



The decision to establish foreign operations through direct investment or licensing depends on (1) the extent to which capital is used in the production process, (2) the size of the foreign market, and (3) the amount of fixed cost a business must bear when establishing an overseas facility.

Several factors influence the output level at which A-B's brewing subsidiary begins to realize an absolute cost advantage compared to the Canadian brewery (400 cases in Figure 9.2). To the extent that production is capital intensive and A-B's brewing subsidiary can acquire capital at a lower cost than that paid by the Canadian brewery, the variable cost advantage of the subsidiary is greater. This neutralizes the influence of a fixed cost disadvantage for the subsidiary at a lower level of output. The amount of the brewing subsidiary's fixed costs also has a bearing on this minimum output level. Smaller fixed costs lower the subsidiary's average total costs, again resulting in a smaller output at which the subsidiary first begins to have an absolute cost advantage.

As noted, international business decisions are influenced by such factors as production costs, fixed costs of locating overseas, the relative importance of labor and capital in the production process, and the size of the foreign market. Another factor is the element of risk and uncertainty. When determining where to locate production operations, management is concerned with possibilities such as currency fluctuations and subsidiary expropriations.

Country Risk Analysis

Although investing or lending abroad can be rewarding, these activities come with accompanying risks. The Russian government might expropriate the assets of foreign investors or make foreign loan repayments illegal. Thus, MNEs and banks carry out a **country risk analysis** to help them decide whether to do business abroad.

INTERNATIONAL TRADE APPLICATION

Do U.S. Multinationals Exploit Foreign Workers?

Do U.S. multinational businesses exploit workers in developing countries? According to critics, maximizing profits is the only thing that matters to multinationals: They search the globe for the cheapest labor when deciding where to locate factories. The only gain from this behavior, critics argue, accrues to the owners of the businesses who have shifted operations from low-wage factories in industrialized countries to poverty-wage factories in developing countries. According to critics, workers in developing countries are underpaid.



Indeed, multinationals are in business for profits. But this does not seem to be troublesome for many workers in developing countries who compete to work for them. People who go to work for a foreign-owned business do so because they prefer it to the alternative, whatever that may be. In their own view, the new jobs make them better off.

Assume that the critics are right and that these workers are being exploited. One remedy would be to admonish multinationals for operating in developing countries. If multinationals stopped hiring workers in developing countries, the workers would, in their own estimation, become worse off. Another course is to entice multinationals to pay workers in developing countries wages that are as high as the wages paid to workers in industrial countries. This would discourage direct investment in developing countries. Why? Workers in developing countries are paid less than workers in industrial countries because they are generally less productive: They often work with less advanced machinery and the surrounding infrastructure is inadequate, which reduces productivity. These workers are attractive to multinationals, despite their lower productivity, because they are cheap. If you were to wipe out that

offsetting advantage, you would make them unemployable. Bucking under pressure to extend U.S. or European pay scales to developing countries could mean shutting down local factories—hurting people, not helping them. Productivity aside, should “responsible” multinationals pay their developing country employees more than other local workers? To hire workers, they may not have to provide a premium over local wages if they can offer other advantages, such as a modern factory in which to work rather than a sweatshop. By participating in the local labor market and adding to the total demand for labor, the multinationals would most likely be increasing wages for all workers, not just those they employ.

However, evidence suggests that multinationals do pay a wage premium that apparently reflects the desire to recruit relatively skilled workers. Economists at the Peterson Institute of International Economics estimate that during the 1990s, the wages paid by multinationals to poor country workers were about double the local manufacturing wage; wages paid by multinationals to workers in middle-income countries were about 1.8 times the local manufacturing wage. Do U.S. multinationals underpay workers in developing countries? By U.S. standards, they do. But U.S. standards are irrelevant in developing countries: Few workers are paid at U.S. levels in these countries. The key point is that by local standards, these workers typically fare quite well.

What do you think? Do you feel that multinational firms provide overall benefits to people in developing countries?

Source: From Edward Graham, *Fighting the Wrong Enemy* (Washington, DC: Institute for International Economics, 2000).

Individuals holding positions of responsibility with internationally oriented firms and banks engage in country risk analysis by evaluating the risk for each country in which they are considering doing business. Officers at Chase Manhattan Bank may establish limits on the amount of loans they are willing to make to clients in Turkey according to the risk of terrorism, as well as market factors. If Toyota fears runaway inflation and escalating labor costs in Mexico, it may refrain from establishing an auto assembly plant there.

Assessing the cost and benefits of doing business abroad entails analyses of political, financial, and economic risk. *Political risk* analysis is intended to assess the political stability of a country and includes criteria such as government stability, corruption, domestic conflict, religious tensions, and ethnic tensions. *Financial risk* analysis investigates a country's ability

to finance its debt obligations and includes factors such as foreign debt as a percentage of gross domestic product (GDP), loan default, and exchange rate stability. *Economic risk* analysis determines a country's current economic strengths and weaknesses by looking at its rate of growth in GDP, per capita GDP, inflation rate, and the like. Analysts then calculate a composite country risk rating based on these three categories of risk. This composite rating provides an overall assessment of the risk of doing business in some country.

Country risk analysis is intended for a particular user. A company engaged in international tourism will be concerned about country risk as it applies to its attractiveness as a vacation destination. In this case, the composite risk rating of Venezuela may not be of much use. It is possible that Venezuela might be considered high risk in its composite rating, but not present a substantial risk to travelers because its composite risk is decreased by such factors as low financial or economic risk, a miserable investment climate, or other factors that do not threaten tourists. However, Israel might be judged as moderately risky overall due to a stable government and sound economic policies, but still present significant political risk to tourists because of religious and ethnic tensions. In these cases, a better understanding of risk can be ascertained by taking into account particular components of risk such as law and order or internal conflict, rather than the composite risk rating.

When conducting country risk analysis, MNEs and banks may obtain help from organizations that analyze risk. Political Risk Services publishes a monthly report called the *International Country Risk Guide*.¹ The guide provides individual ratings on more than 130 advanced and developing countries for political, financial, and economic risk, plus a composite rating. In calculating the composite risk rating, the political risk factors are given a weighting of 50 percent, while the financial and economic risk factors each contribute 25 percent. Examples of composite ratings are provided in Table 9.3. In assessing a country's composite risk, a higher score indicates a lower risk and a lower score indicates a higher risk. Such information can be helpful to a firm as a predictive tool for international investments and financial transactions.

TABLE 9.3**Selected Country Risks Ranked by Composite Ratings, 2016**

Country	Composite Risk Rating (100 Point Maximum)	
Switzerland	88.0	
Singapore	86.8	
Germany	84.3	
United States	79.3	
China	71.3	
Brazil	63.3	
Russia	62.5	
Ukraine	55.3	
Zimbabwe	54.5	
Sudan	48.3	

Source: From Political Risk Services, *International Country Risk Guide*, available at <https://www.prsgroup.com/FreeSamplePage.aspx/>.

¹There are other services that measure country risk, some of the more popular ones being *Euromoney*, Economist Intelligence Unit, Bank of America World Information Services, Business Environment Risk Intelligence, Institutional Investor, Standard and Poor's Rating Group, and Moody's Investor Services.

After a firm determines a country's risk rating, it must decide whether that risk is tolerable. If the risk is estimated to be too high, then the firm does not need to pursue the feasibility of the proposed project any further. If the risk rating of a country is in the acceptable range, any project related to that country deserves further consideration. In terms of the *International Country Risk Guide's* ratings of country risk, the following categories are used to identify levels of risk: (1) low risk, 80–100 points; (2) moderate risk, 50–79 points; and (3) high risk, 0–49 points. These broad categories must be tempered to fit the needs of particular MNEs and banks.

International Trade Theory and Multinational Enterprise

Perhaps the main explanation of the development of MNEs lies in the strategies of corporate management. The reasons for engaging in international business can be outlined in terms of the comparative advantage principle. Corporate managers see advantages they can exploit in the forms of access to factor inputs, new technologies and products, and managerial know-how. Organizations establish overseas subsidiaries largely because profit prospects are best enhanced by foreign production.

From a trade theory perspective, the multinational enterprise analysis is fundamentally in agreement with the predictions of the comparative advantage principle. Both approaches contend that a given commodity will be produced in a low-cost country. The major difference between the multinational enterprise analysis and the conventional trade model is that the former stresses the international movement of factor inputs, whereas the latter is based on the movement of merchandise among nations.

International trade theory suggests that the aggregate welfare of both the source and host countries is enhanced when MNEs make foreign direct investments for their own benefit. The presumption is that if businesses can earn a higher return on overseas investments than on those at home, resources are transferred from lower to higher productive uses, and on balance, the world allocation of resources will improve. Analysis of MNEs is essentially the same as conventional trade theory that rests on the movement of products among nations.

Despite the basic agreement between conventional trade theory and the multinational enterprise analysis, there are some notable differences. The conventional model presupposes that goods are exchanged between independent organizations on international markets at competitively determined prices. But MNEs are generally vertically integrated companies whose subsidiaries manufacture intermediate goods as well as finished goods. In an MNE, sales become *intra-firm* when goods are transferred from subsidiary to subsidiary. Although such sales are part of international trade, their value may be determined by factors other than a competitive pricing system.

Foreign Auto Assembly Plants in the United States

Since the 1980s, the growth of Japanese direct investment in the U.S. auto industry has been widely publicized. Japanese automakers have invested billions of dollars in U.S.-based assembly facilities, known as **transplants**, as seen in Table 9.4. Establishing transplants in the United States provides a number of benefits to Japanese automakers, including opportunities to:

- Silence critics who insist that autos sold in the United States must be built there.
- Avoid the potential import barriers of the United States.

TABLE 9.4**Selected Foreign Auto Assembly Plants in the United States**

Plant Name/Parent Company	Location
Honda of America, Inc. (Honda)	Marysville, Ohio; Lincoln, Alabama; East Liberty, Ohio; Greensburg, Indiana
Toyota Motor Manufacturing, USA, Inc. (Toyota)	Georgetown, Kentucky; Huntsville, Alabama; Princeton, Indiana; San Antonio, Texas; Buffalo, West Virginia; Blue Springs, Mississippi
Nissan Motor Manufacturing Corp. (Nissan)	Smyrna, Tennessee; Decherd, Tennessee; Canton, Mississippi
Mazda Motor Manufacturing, USA, Inc. (Mazda)	Claycomo, Missouri
Volkswagen, USA, Inc. (Volkswagen)	Chattanooga, Tennessee

- Gain access to an expanding market at a time when the Japanese market is nearing saturation.
- Provide a hedge against fluctuations in the yen–dollar exchange rate.

Toyota has pledged to produce in North America at least two-thirds of the vehicles it sells in the region. It regards manufacturing more vehicles in the United States as a type of political insurance. By sprinkling manufacturing jobs across many states, Toyota has built a network of state and federal government officials friendly to the company.

The growth of Japanese investment in the U.S. auto industry has led to both praise and concern over the future of U.S.-owned auto manufacturing and parts supplier industries. Proponents of foreign direct investment maintain that it fosters improvement in the overall competitive position of the domestic auto assembly and parts industries. They also argue that foreign investment generates jobs and provides consumers with a wider product choice at lower prices than would otherwise be available. However, the United Auto Workers (UAW) union maintains that this foreign investment results in job losses in the auto assembly and parts supplier industries.

One factor that influences the number of workers hired is a company's *job classifications*, which stipulate the scope of work each employee performs. As the number of job classifications increases, the scope of work decreases, along with the flexibility of using available employees; this decrease can lead to falling worker productivity and rising production costs.

Japanese-affiliated auto companies have traditionally used significantly fewer job classifications than traditional U.S. auto companies. Japanese transplants use work teams, and each team member is trained to do all the operations performed by the team. A typical Japanese affiliated assembly plant has three to four job classifications: one team leader, one production technician, and one or two maintenance technicians. Often, jobs are rotated among team members. In contrast, traditional U.S. auto plants have enacted more than 90 different job classifications, and employees generally perform only those operations specifically permitted for their classification. These trends have contributed to the superior labor productivity of Japanese transplants compared to the U.S. Big Three (GM, Ford, and Chrysler). Although powerful forces within the U.S. Big Three have resisted change, international competition has forced U.S. automakers to slowly dismantle U.S. management and production methods and remake them along Japanese lines.

For policy makers, the broader issue is whether the Japanese transplants have lived up to expectations. When the Japanese initiated investment in U.S. auto manufacturing facilities in the 1980s, many Americans viewed them as models for a revitalized U.S. auto industry and new customers for U.S. auto parts suppliers. Transplants were seen as a way of providing jobs for U.S. autoworkers whose jobs were dwindling as imports increased. When the transplant factories were announced, Americans anticipated that transplant production would be based primarily on American parts, material, and labor; transplant production would displace imports in the U.S. market while transferring new management techniques and technology to the United States.

Certainly, the transplant factories boosted the economies in the regions where they located. There is also no doubt that the transplants helped to transfer Japanese quality control, just-in-time delivery, and other production techniques to the United States. However, the original expectations of the transplants were only partially fulfilled. Skeptics contended that Japanese manufacturing operations were twice as likely to import parts for assembly in the United States as the average foreign company, and four times as likely to import parts as the average U.S. company. Extensive use of imported parts by Japanese transplants contributed to a U.S. automotive trade deficit with Japan and resulted in fewer jobs for U.S. autoworkers.

International Joint Ventures

Another area of multinational enterprise involvement is **international joint ventures**. A joint venture is a business organization established by two or more companies that combines their skills and assets. It may have a limited objective (research or production) and be short lived. It may also be multinational in character, involving cooperation among several domestic and foreign companies. Joint ventures differ from mergers in that they involve the creation of a *new* business firm, rather than the union of two existing companies.

There are three types of international joint ventures. The first is a joint venture formed by two businesses that conduct business in a third country. A U.S. oil firm and a UK oil firm may form a joint venture for oil exploration in the Middle East. Second is the formation of a joint venture with local private interests. Honeywell Information Systems of Japan was formed by Honeywell, Inc., of the United States and Mitsubishi Office Machinery Company of Japan to sell information system equipment to the Japanese. The third type of joint venture includes participation by local government. Bechtel of the United States, Messerschmitt–Boelkow–Blohm of West Germany, and National Iranian Oil (representing the government of Iran) formed the Iran Oil Investment Company for oil extraction in Iran.

Several reasons have been advanced to justify the creation of joint ventures. Some functions such as R&D can involve costs too large for any one company to absorb by itself. Many of the world's largest copper deposits have been owned and mined jointly by the largest copper companies on the grounds that joint financing is required to raise enough capital. The exploitation of oil deposits is often done by a consortium of several oil companies. Exploratory drilling projects typically involve several companies united in a joint venture, and several refining companies traditionally own long distance crude oil pipelines. Oil refineries in foreign countries may be co-owned by several large U.S. and foreign oil companies.

Another factor that encourages the formation of international joint ventures is the restrictions some governments place on the foreign ownership of local businesses. Governments in developing nations often close their borders to foreign companies unless they are willing to take on local partners. Mexico, India, and Peru require that their own national

companies represent a major interest in any foreign company conducting business within their borders. The foreign investor is forced to either accept local equity participation or forgo operation in the country. Such government policies are defended on the grounds that joint ventures result in the transfer of managerial techniques and know-how to the developing nation. Joint ventures may also prevent the possibility of excessive political influence on the part of foreign investors. Also, joint ventures help minimize dividend transfers abroad and thus strengthen the developing nation's balance-of-payments.

International joint ventures are also viewed as a means of forestalling protectionism against imports. Apparently motivated by the fear that rising protectionism might restrict their access to U.S. markets, Japanese manufacturers (Toyota Motor Enterprise) increasingly formed joint ventures with U.S. enterprises in the 1980s. Such ventures typically resulted in U.S. workers assembling Japanese components, with the finished goods sold to U.S. consumers. Not only did this process permit Japanese production to enter the U.S. market, but it also blurred the distinction between U.S. and Japanese production. Just who is us? And who is them? The rationale for protecting domestic output and jobs from foreign competition is lessened.

There are disadvantages to forming an international joint venture. A joint venture is a cumbersome organization compared with a single organization. Control is divided, creating the problem of "two masters." Success or failure depends on how well companies can work together despite having different objectives, corporate cultures, and ways of doing things. The action of corporate chemistry is difficult to predict, but it is critical, because joint venture agreements usually provide both partners an ongoing role in management. When joint venture ownership is divided equally, as often occurs, deadlocks in decision making can take place. If balance is to be preserved between different economic interests, negotiation must establish a hierarchical command. Even when negotiated balance is achieved, it can be upset by changing corporate goals or personnel.

Welfare Effects

International joint ventures can yield both welfare-increasing and welfare-decreasing effects for the domestic economy. Joint ventures lead to *welfare gains* when (1) the newly established business adds to preexisting productive capacity and fosters additional competition, (2) the newly established business is able to enter new markets that neither parent could have entered individually, or (3) the business yields cost reductions that would have been unavailable if each parent performed the same function separately. The formation of a joint venture may also result in *welfare losses*. For instance, it may give rise to increased market power, suggesting greater ability to influence market output and price. This is especially likely to occur when the joint venture is formed in markets in which the parents conduct business. Under such circumstances, the parents, through their representatives in the joint venture, agree on prices and output in the very market that they themselves operate. Such coordination of activities limits competition, reinforces upward pressure on prices, and lowers the level of domestic welfare.

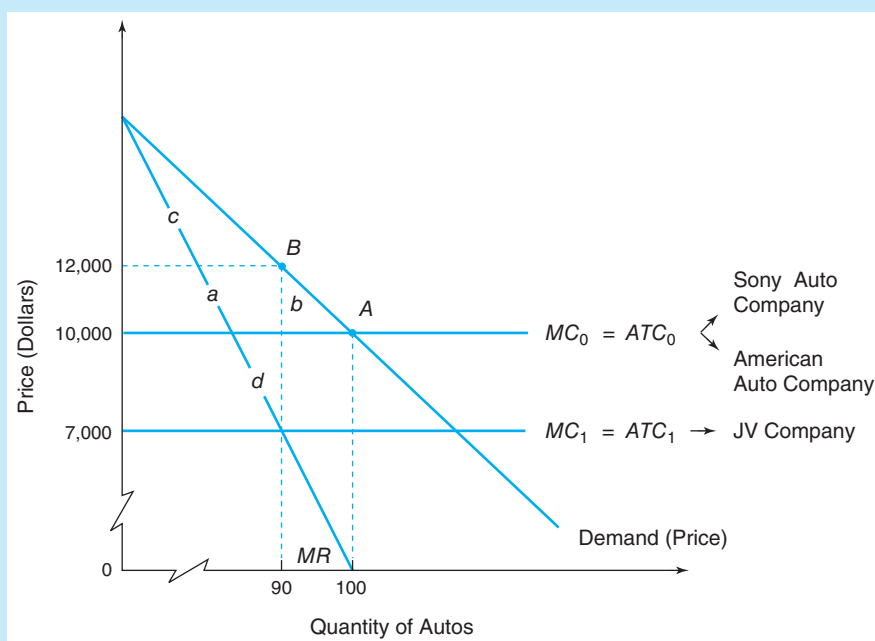
Let's consider an example that contrasts two situations: Two competing companies sell autos in the domestic market; the two competitors form a joint venture that operates as a single seller (a monopoly) in the domestic market. We would expect to see a higher price and smaller quantity when the joint venture behaves as a monopoly. This result will always occur as long as the marginal cost curve for the joint venture is identical to the horizontal sum of the marginal cost curves of the individual competitors. The result of this *market power effect* is a deadweight welfare loss for the domestic economy—a reduction in consumer surplus that is not offset by a corresponding gain to producers. If the formation of the joint venture entails *productivity gains* that neither parent can realize prior to its

formation, domestic welfare may increase. This is because a smaller amount of the domestic economy's resources is now required to produce any given output. Whether domestic welfare rises or falls because of the joint venture depends on the magnitudes of these two opposing forces.

Figure 9.3 illustrates the welfare effects of two parent companies forming a joint venture in the market in which they operate. Assume that Sony Auto Company of Japan and American Auto Company of the United States are the only two firms producing autos for sale in the U.S. market. Assume each company realizes constant long-run costs, suggesting that the average total cost equals marginal cost at each level of output. Let the cost schedules of each company prior to the formation of the joint venture be $MC_0 = ATC_0$, which equals \$10,000. Thus, $MC_0 = ATC_0$ becomes the long-run market supply schedule for autos.

FIGURE 9.3

Welfare Effects of an International Joint Venture



An international joint venture can yield a welfare-decreasing market power effect and a welfare-increasing cost reduction effect. The source of the cost reduction effect may be lower resource prices or improvements in technology and productivity. The joint venture leads to improvements in national welfare if its cost reduction effect is due to improvements in technology and productivity and if it more than offsets the market-power effect.

Assume that Sony Auto Company and American Auto Company initially operate as competitors, charging a price equal to marginal cost. In Figure 9.3, market equilibrium exists at point A, where 100 autos are sold at a price of \$10,000 per unit. Consumer surplus totals area $a + b + c$. Producer surplus does not exist, given the horizontal supply schedule of autos (recall that producer surplus equals the sum of the differences between the market price and each of the minimum prices indicated on the supply schedule for quantities between zero and the market output).

Now suppose that the two competitors announce the formation of a joint venture known as JV Company that manufactures autos for sale in the United States. The autos sold by JV replace the autos sold by the two parents in the United States.

Consider that the formation of JV Company entails new production efficiencies that result in cost reductions. Let JV's new cost schedule, $MC_1 = ATC_1$, be located at \$7,000. As a monopoly, JV maximizes profit by equating marginal revenue with marginal cost. Market equilibrium exists at point B , where 90 autos are sold at a price of \$12,000 per unit. The price increase leads to a reduction in consumer surplus equal to area $a + b$. Of this amount, area a is transferred to JV as producer surplus. Area b represents the loss of consumer surplus that is *not* transferred to JV and becomes a deadweight welfare loss for the U.S. economy (the consumption effect).

Against this deadweight welfare loss lays the efficiency effect of JV Company: a decrease in unit costs from \$10,000 to \$7,000 per auto. JV can produce its profit-maximizing output, 90 autos, at a cost reduction equal to area d as compared with the costs that would exist if the parent companies produced the same output. Area d represents additional producer surplus that is a welfare gain for the U.S. economy. Our analysis concludes that for the United States, the formation of JV Company is desirable if area d exceeds area b .

It has been assumed that JV Company achieves cost reductions that are unavailable to either parent as a stand-alone company. Whether the cost reductions benefit the overall U.S. economy depends on their source. If they result from *productivity* improvements (new work rules leading to higher output per worker), a welfare gain exists for the economy because fewer resources are required to produce a given number of autos and the excess can be shifted to other industries. However, the cost reductions stemming from JV Company's formation may be *monetary* in nature. Being a newly formed company, JV may be able to negotiate wage concessions from domestic workers that could not be achieved by the American Auto Company. Such a cost reduction represents a transfer of dollars from domestic workers to JV profits and does not constitute an overall welfare gain for the economy.

Multinational Enterprises as a Source of Conflict

Advocates of MNEs often point out the benefits these enterprises can provide for the nations they affect, including both the source country where the parent organization is located and the host country where subsidiary firms are established. Benefits allegedly exist in the forms of additional levels of investment and capital, creation of new jobs, and the development of technologies and production processes. Critics contend that MNEs often create trade restraints, cause conflict with national economic and political objectives, and have adverse effects on a nation's balance-of-payments. These arguments perhaps explain why some nations frown on direct investment, while others welcome it. This section examines some of the more controversial issues involving multinationals. The frame of reference is the U.S. MNE, although the same issues apply no matter where the parent organization is based.

Employment

One of the most hotly debated issues surrounding the MNE is its effects on employment in both the host and source countries. Multinationals often contend that their foreign direct investment yields favorable benefits to the labor force of the recipient nation. Setting up a new multinational automobile manufacturing plant in Canada creates more jobs for Canadian workers. But the MNE's effect on jobs varies from business to business. One source of controversy arises when the direct investment spending of foreign-based MNEs is

used to purchase already existing local businesses rather than to establish new ones. In this case, the investment spending may not result in additional production capacity and may not have noticeable effects on employment in the host country. Another problem arises when MNEs bring in foreign managers and other top executives to run the subsidiary in the host country. In U.S. oil companies located in Saudi Arabia, the Saudis are increasingly demanding their own people be employed in higher level positions.

As for the source country, the issues of runaway jobs and cheap foreign labor are of vital concern to home workers. Because labor unions are confined to individual countries, the multinational nature of these businesses permits them to escape much of the collective bargaining influence of domestic unions. It is also pointed out that MNEs can seek out those countries where labor has minimal market power.

The ultimate impact that MNEs have on employment in the host and source countries seems to depend in part on the time scale. In the short run, the source country will likely experience an employment decline when production is shifted overseas. Other industries in the source country may find foreign sales rising over time. This is because foreign labor consumes as well as produces and tends to purchase more as employment and income increase as a result of increased investment. Perhaps the main source of controversy stems from the fact that the MNEs are involved in rapid changes in technology and in the transmission of productive enterprise to host countries. Although such efforts may promote global welfare in the long run, the potential short-run adjustment problems facing source country labor cannot be ignored.

Caterpillar Bulldozes Canadian Locomotive Workers

The ability of a company to reduce its labor cost tends to increase when the company has market alternatives in the hiring of workers. Consider the case of Caterpillar Inc., headquartered in Peoria, Illinois. Caterpillar is a global producer of heavy machinery, diesel engines, construction and mining equipment, tractors, and the like.

In 2012, Caterpillar shut down a 62-year-old railroad locomotive plant in London, Ontario, that employed about 450 workers. The Canadian Auto Workers (CAW) union, which represented most of the workers, described the closure as selfish behavior on the part of Caterpillar's management. Also, the CAW noted that upon announcing the closure of the plant, Caterpillar immediately publicized the opening of a new locomotive plant in Muncie, Indiana. At this plant, workers have the right but are not compelled to join a labor union. Caterpillar made it clear that it had no desire to negotiate with union representatives at the Muncie plant. Why?

By moving production to Muncie, where unemployment was high and nonunion workers were plentiful, Caterpillar could pay workers wages about half the Ontario level: Caterpillar offered jobs ranging from \$12 to \$18.50 per hour, in contrast to wages averaging \$35 (U.S. dollars) per hour at the Ontario plant. Considering the Ontario plant's labor costs to be noncompetitive, Caterpillar demanded from its workers a 50 percent cut in wages, but this was rejected by the CAW. After ten months of unsuccessful negotiations, Caterpillar announced that its wage dispute with the CAW could not be resolved. Caterpillar locked out its Canadian workers and shut down the locomotive factory. Besides moving to Muncie, Caterpillar increased its locomotive production in Mexico and Brazil where wages were lower than in Canada or the United States.

Caterpillar's strategy of closing a unionized plant differed from its chief competitor in locomotives: General Electric Co. In 2011, GE peacefully negotiated a four-year contract with its unionized workers that raised annual wages by about 2.25 percent. This resulted in GE's locomotive workers in Erie, Pennsylvania, earning \$25–\$36 an hour, about double that

of Caterpillar's wages in Muncie. GE announced it would open another locomotive-producing plant in Fort Worth, Texas, a state where union membership is low and wages would be less than the levels paid to its Erie workers.²

Technology Transfer

Besides promoting runaway jobs, multinationals can foster the transfer of technology (knowledge and skills applied to how goods are produced) to other nations. Such a process is known as **technology transfer**.

Technology has been likened to a contagious disease: It spreads further and more quickly if there are more personal contacts. Foreign trade is viewed as a channel through which people in different nations make contacts and people in one nation get to know about the products of other nations. Foreign direct investment is an even more effective method of technology transfer. When foreign firms with technological advantages establish local production subsidiaries, the personal contacts between these subsidiaries and local firms are more frequent and closer than when firms are located abroad.

International trade and foreign direct investment also facilitate technology transfer via the so-called *demonstration effect*: As a firm shows how its products operate, this sends important information to other firms that such products exist and are usable. Technology transfer is also aided by the *competition effect*: When a foreign firm manufactures a superior product that is popular among consumers, other firms are threatened. To survive, they must innovate and improve the quality of their products.

Although technology transfer may increase the productivity and competitiveness of recipient nations, donor nations may react against it because it is detrimental to their economic base. Donor nations contend that the establishment of production operations abroad by multinational enterprises decreases their export potential and leads to job losses for their workers. By sharing technical knowledge with foreign nations, a donor nation may eventually lose its international competitiveness, causing a decrease in its rate of economic growth.

Consider the case of the technology transfer to China in the mid-1990s. After decades of mutual hostility, the United States hoped that by the 1990s China would open itself to the outside world and engage in free trade so foreign nations could trade with China according to the principle of comparative advantage. Instead, China used its leverage as a large buyer of foreign products to pressure multinational enterprises to localize production and transfer technology to China to help it become competitive. With multinational enterprises willing to outbid each other to woo Chinese bureaucrats, China was in a favorable position to reap the benefits of technology transfer.

Microsoft Corporation, under the threat of having its software banned, co-developed a Chinese version of Windows 95 with a local partner and agreed to aid efforts to develop a Chinese software industry. Another example was General Motors. To beat Ford for the right to become a partner in manufacturing sedans in Shanghai, GM agreed to bring in dozens of joint ventures for auto parts and to design most of the car in China. It also agreed to establish five research institutes to teach Chinese engineers to turn technological theory in fields such as power trains and fuel injection systems into commercial applications.

American multinationals argued that transferring technology to China was largely risk free because a competitive challenge from China was decades away. However, the acceleration

²James Hagerty, "Caterpillar Closes Plant in Canada after Lockout," *The Wall Street Journal*, February 4, 2012, p. B-1. See also, James Hagerty and Alistair MacDonald, "As Unions Lose Their Grip, Indiana Lures Manufacturing Jobs," *The Wall Street Journal*, March 18, 2012, pp. A-1 and A-12; and Shruti Date Sing, "Caterpillar Factory Closing Deal Ratified by CAW," *Bloomberg News*, February 23, 2012.

of technology transfer in the mid-1990s became increasingly unpopular with U.S. labor unions that feared their members were losing jobs to lower-paid Chinese workers. U.S. government officials also feared that the technology transfer was helping create a competitor of extreme proportions. Let us consider the case of General Electric's technology transfer to China.

General Electric's Trade-Off for Entry into the Chinese Market: Short-Term Sales for Long-Term Competition For decades, General Electric (GE) had an effective strategy for being competitive in the Chinese market for power-generating equipment: sell the best equipment at the lowest price. By the first decade of the 2000s, the formula was altered. Besides offering high-quality gas-fired turbines at a competitive price, GE had to agree to share with the Chinese sophisticated technology for producing the turbines. To be considered for turbine contracts worth several billion dollars, GE, Mitsubishi, Siemens, and other competitors were obligated to form joint ventures with state-owned Chinese power companies. General Electric was also required to transfer to its new partners the technology and advanced manufacturing specifications for its gas-fired turbine that GE had spent more than \$500 million to develop. Officials from GE noted that the Chinese wanted to have complete access to its technology, while GE wanted to protect the technology in which it made a large financial investment.

The vast size of China's electricity market convinced GE executives that this market was worth pursuing despite the technology demands. The U.S. market for gas-fired turbines was weak because of past spending sprees to increase capacity by power companies and utilities. On the other hand, China was expected to spend more than \$10 billion a year constructing electricity plants in the near future. General Electric officials thus faced the trade-off of short-term sales in China for long-term competition from Chinese manufacturers. In the end, GE won an order for 13 of its gas-fired turbines and, as part of the agreement, also had to share technology with its Chinese partners.

Before the gas-fired turbine venture with GE, Chinese manufacturers had mastered only the technology required for making much less efficient steam-powered turbines. That technology was obtained in part through previous joint ventures with firms such as Westinghouse Electric Co. The Chinese demanded the technology behind the more efficient gas-fired turbines.

General Electric officials noted that Chinese competition was not imminent in highly advanced products like gas-fired turbines. In the past, even after acquiring expertise from foreign corporations, Chinese firms lacked the skill necessary to fully exploit the technology and become competitive in world markets. By the time Chinese companies mastered the technology they initially obtained from GE, GE had developed more advanced technologies. Nonetheless, Chinese officials looked ahead to new rounds of power-generating equipment bidding by GE and its competitors, when Chinese officials hoped to obtain even more lucrative technology sharing deals.³

Boeing Transfers Technology to China Boeing provides another example of technology transfer. Since the 1970s, Boeing Co. has maintained an enviable position in China. The firm sells jetliners to China and currently accounts for about half of the country's commercial aircraft. Analysts estimate that about 5,000 jetliners worth a total of \$600 billion will be sold in China between 2013 and 2030. Is Boeing about to lose its lucrative position in China?

³"China's Price for Market Entry: Give Us Your Technology, Too," *The Wall Street Journal*, February 26, 2004, pp. A-1 and A-6.

China is increasingly using its leverage as a large buyer of aircraft to pressure Boeing for the same type of concessions it commonly extracts from other foreign firms that conduct business there. China often requires them to acquire local partners and share proprietary technology in exchange for access to its fast-growing market.

To secure China's orders for its 787 Dreamliner, Boeing agreed not only to outsource an unprecedented amount of the jetliner's parts production to partners in China (and also in Europe and Japan), but to transfer to them unprecedented technological know-how. Prior to the 787, Boeing had kept almost all of the control of jetliner design and provided foreign suppliers precise engineering specifications for building parts, the only exception being jet engines that have traditionally been designed and produced by companies such as Rolls Royce, Pratt and Whitney, and General Electric. The 787 program deviated from this strategy. Boeing provided major suppliers a large portion of its production manual, "How to Build a Commercial Airplane," a guide that its engineers have been working on for the last five decades. This manual provided foreign suppliers considerable insight into the art of building a jetliner.

Commercial Aircraft Corporation of China (Comac) is a government-sponsored plane maker that plans to launch its first jetliner by 2016. It requires a lot of technology to build a jetliner, a technology China does not yet have, and that's where Boeing enters the picture. In 2012, Chinese officials notified Boeing that it will have to fork over more intellectual property if it wants to keep selling planes in China. This resulted in Boeing and Comac forming a technology joint venture in which the companies will work together on biofuels and fuel efficiency technologies. American critics point out that this is the first step on the familiar path of technology transfer to a Chinese competitor. Although the joint venture is supposed to focus only on new technologies, there is no way to keep Comac researchers working along with Boeing engineers from gaining a lot more than that.

Comac is not just any competitor: It is backed by the Chinese government. Will the government pressure Chinese airlines to buy planes from Comac, at the expense of Boeing or Airbus? Will China have the continental clout to persuade other Asian carriers to buy from Comac? Like Asian automakers, Comac may someday compete globally, including in the United States. This would strike at the very heart of the existing Boeing–Airbus duopoly in control of most of the world's large commercial aviation market.⁴

National Sovereignty

Another controversial issue involving the conduct of MNEs is their effect on the economic and political policies of the host and source governments. Many nations fear that the presence of MNEs in a given country results in a loss of its national sovereignty. MNEs may resist government attempts to redistribute national income through taxation. By using accounting techniques that shift profits overseas, an MNE may be able to evade the taxes of a host country. An MNE could accomplish this evasion by raising prices on goods from its subsidiaries in nations with modest tax rates to reduce profits on its operations in a high tax nation where most of its business actually takes place.

The political influence of MNEs is also questioned by many, as illustrated by the case of Chile. For years, U.S. businesses had pursued direct investments in Chile, largely in copper mining. When Salvador Allende was in the process of winning the presidency, he was

⁴Donald Barlett and James Steele, *The Betrayal of the American Dream*, Public Affairs/Perseus Books Group, New York, 2012; Dennis Shea, *The Impact of International Technology Transfer on American Research and Development*, Committee on Science, Space, and Technology, Subcommittee on Investigations and Oversight, U.S. House of Representatives, December 5, 2012; The Boeing Company, *2011 Annual Report*, Chicago, IL; and Dick Nolan, "Is Boeing's 787 Dreamliner a Triumph or a Folly?" *Harvard Business Review*, December 23, 2009.

opposed by U.S. businesses fearing that their Chilean operations would be expropriated by the host government. International Telephone and Telegraph tried to prevent the election of Allende and attempted to promote civil disturbances that would lead to his fall from power. Another case of MNEs meddling in host country affairs is that of United Brands (now Chiquita), who engaged in food product sales. In 1974, the company paid a \$1.25 million bribe to the president of Honduras in return for an export tax reduction applied to bananas. When the payoff was revealed, the president was removed from office.

There are other areas of controversy. Suppose a Canadian subsidiary of a U.S.-based MNE conducts trade with a country subject to U.S. trade embargoes. Should U.S. policy makers outlaw such activities? The Canadian subsidiary may be pressured by the parent organization to comply with U.S. foreign policy. During international crises, MNEs may move funds rapidly from one financial center to another to avoid losses (make profits) from changes in exchange rates. This conduct makes it difficult for national governments to stabilize their economies.

In a world where national economies are interdependent and factors of production are mobile, the possible loss of national sovereignty is often viewed as a necessary cost whenever direct investment results in foreign control of production facilities. Whether the welfare gains accruing from the international division of labor and specialization outweigh the potential diminution of national independence involves value judgments by policy makers and interested citizens.

Balance-of-Payments

The United States offers a good example of how an MNE can affect a nation's balance-of-payments. The *balance-of-payments* is an account of the value of goods and services, capital movements (including foreign direct investment), and other items that flow into or out of a country. Items that make a positive contribution to a nation's payments position include exports of goods and services and capital inflows (foreign investment entering the home country) whereas the opposite flows weaken the payments position. At first glance, we might conclude that when U.S. MNEs make foreign direct investments, these payments represent an outflow of capital from the United States and hence a negative factor on the U.S. payments position. Although this view may be true in the short run, it ignores the positive effects on trade flows and earnings that direct investment provides in the long run.

When a U.S. MNE sets up a subsidiary overseas, it generally purchases U.S. capital equipment and materials needed to run the subsidiary. Once in operation, the subsidiary tends to purchase additional capital equipment and other material inputs from the United States. Both of these factors stimulate U.S. exports, strengthening its balance-of-payments position.

Another long-run impact that U.S. foreign direct investment has on its balance-of-payments is the return inflow of income generated by overseas operations. Such income includes earnings of overseas affiliates, interest and dividends, and fees and royalties. These items generate inflows of revenues for the economy and strengthen the balance-of-payments position.

Transfer Pricing

Controversy also confronts MNEs in their use of **transfer pricing**, the pricing of goods within an MNE. Goods from the company's production division may be sold to its foreign marketing division, or inputs obtained by a parent company can come from a foreign subsidiary. The transfer price may be a purely arbitrary figure that means it may be unrelated to costs incurred or to operations carried out. The choice of the transfer prices affects the division of the total profit among the parts of the company and thus influences its overall tax burden.

Suppose that Dell Inc. produces computers in the United States and buys microchips from its own subsidiary in Malaysia. Also suppose that corporate taxes are 34 percent in the United States and 20 percent in Malaysia. Imagine that Dell tells its subsidiary to sell microchips to Dell at a grossly inflated price (the transfer price). Dell has a large business expense to deduct when determining its taxable income on its other profitable operations in the United States. To the extent that transfer pricing allows Dell to reduce its taxable income in the United States, the firm avoids being taxed at the rate of 34 percent. The increased income of Dell's Malaysian subsidiary that occurs because of the inflated transfer price is taxed at the lower rate of 20 percent. Dell can reduce its overall tax burden by reporting most of its income in Malaysia, the low-tax country, even though the income is earned in the United States, the high-tax country. The tax paid to the U.S. government decreases while the tax paid to the Malaysian government increases. In other words, one government's loss is the other government's gain. So, one government is expected to want to legislate against unfair transfer pricing practices while the other government is expected to resist such legislation.

Both foreign governments and the U.S. government are interested in the part that transfer prices play in the realization of corporate profits. Abuses in pricing across national borders are illegal if they can be proved. According to U.S. Internal Revenue Service (IRS) regulations, enterprises dealing with their own subsidiaries are required to set prices "at arm's length" just as they would for unrelated customers that are not part of the same corporate structure. This process means that prices must relate to actual costs incurred and to operations actually carried out. Proving that the prices that one subsidiary charges another are far from market prices is difficult.

INTERNATIONAL TRADE APPLICATION

The Tax Cuts and Jobs Act of 2017: Apple Plans to Build a New U.S. Campus

When Donald Trump became president, he declared it was time to get America's corporations to bring home some of the \$2.5 trillion cash that they had sitting in lower-tax countries. Trump maintained that by bringing cash home, corporations would invest more in America, leading to economic growth and also more jobs and higher pay for American workers.

Apple Inc. provides an example of a global company that has benefitted from tax avoidance policies. Not only are Apple's iPhones, iPods, and other products high quality and popular throughout the world, but the firm's designers and engineers have a well-earned reputation for creativity. Apple performs most of its product design, software development, and other high-wage functions in the United States. The firm has typically reported only about 30 percent of its profits as being from the United States. Why? To reduce its taxes, Apple designs its business to locate as much profit as



possible in those countries where taxes are low. As of 2017, Apple had accumulated foreign profits of over \$250 billion, stashed away in offshore accounts and not subject to higher U.S. corporate taxes. These profits would be subject to U.S. taxes only when they were brought home (repatriated). Although Apple's tax avoidance practices were legal under the U.S. tax system, critics said that they were unfair and should be reformed.

Led by President Trump and congressional Republicans, in December, 2017 the Tax Cuts and Jobs Act was signed into law. Major elements included reducing tax rates for businesses and individuals. Concerning corporate taxes, the act permanently reduced the federal corporate tax rate from 35 percent to 21 percent, while some related business deductions and credits were decreased or eliminated. This brought the U.S. corporate tax rate closer to that of countries like

(continued)

Canada, which had a 15 percent corporate tax rate, or Ireland, which has a 12.5 percent rate. Also, the act changed the United States from a global to a territorial tax system. Instead of a corporation paying the U.S. tax rate (35 percent) for income earned in any country (less credits for taxes paid to that country), each subsidiary would pay the tax rate of the country in which it is legally established. Finally, the act provided a one-time tax holiday that applied to the repatriation of profits of overseas subsidiaries of American corporations. Under this tax holiday, corporate income brought back to the United States is taxed between 8 and 15.5 percent, instead of the previous corporate tax rate of 35 percent. Simply put, the intent of the Tax Cuts and Jobs Act was to make it more attractive for both U.S. and foreign multinational corporations to invest in the United States. This would contribute to economic growth, more jobs, and higher wages for Americans. But there was no guarantee that corporations would use the tax break to invest in American workers. Instead, would the tax break be used to increase the dividends of corporation stockholders or raise executive pay?

In January, 2018 Apple Inc. announced that it would pay a one-time tax of \$38 billion on its overseas cash

holdings and increase investment spending in the United States. The firm said that it would invest \$30 billion in capital spending in the United States over five years that would create more than 20,000 jobs. Apple noted that it would establish a new campus, which would house technical support for customers, and invest \$20 billion in data centers across the country. Apple cited the corporation tax cut as the reason for its behavior. Donald Trump praised Apple, stating that his policies allowed the company to bring massive amounts of money back to the United States. At the writing of this text, it remains to be seen how other corporations will react to the tax cut.

What do you think? Do you feel that The Tax Cuts and Jobs Act of 2017 will be successful in attracting corporations to invest in the United States? Will the corporate tax cut promote economic growth, resulting in more jobs and higher wages for Americans?

Sources: Sarah Carmichael, "Breaking Down the New U.S. Corporate Tax Law," *Harvard Business Review*, December 26, 2017; Walter Frick, "A Brief Guide to U.S. Corporate Tax Reform," *Harvard Business Review*, September 7, 2017; Gary Hufbauer and Martin Vieiro, *Corporate Taxation and U.S. MNCs: Ensuring a Competitive Economy*, Policy Brief, Peterson Institute for International Economics, Washington, DC, April 2013.

International Labor Mobility: Migration

Historically the United States has been a favorite target for international **migration**. Because of its vast inflow of migrants, the United States has been described as the melting pot of the world. Table 9.5 indicates the volume of immigration to the United States from the 1820s to 2015. Western Europe was a major source of immigrants during this era, with Germany, Italy, and the United Kingdom among the largest contributors. In recent years, large numbers of Mexicans have migrated to the United States as well as people from Asia. Migrants have been motivated by better economic opportunities and noneconomic factors such as politics, war, and religion.

Although international labor movements can enhance the world economy's efficiency, they are often restricted by government controls. The United States, like most countries, limits immigration. Following waves of immigration at the turn of the century, the Immigration Act of 1924 was enacted. Besides restricting the overall flow of immigrants to the United States, the act implemented a quota that limited the number of immigrants from each foreign country. Because the quotas were based on the number of U.S. citizens who had previously emigrated from those countries, the allocation system favored emigrants from northern Europe relative to southern Europe. In the late 1960s, the quota formula was modified, which led to increasing numbers of Asian immigrants to the United States.

TABLE 9.5
U.S. Immigration 1820–2015

Period	Number (thousands)
1820–1840	743
1841–1860	4,311
1861–1880	5,127
1881–1900	8,934
1901–1920	14,531
1921–1940	4,636
1941–1960	3,551
1961–1980	7,815
1981–2000	16,433
2001–2015	15,652

Source: From U.S. Department of Homeland Security, Office of Immigration Statistics, *Yearbook of Immigration Statistics*, 2012, available at <http://www.uscis.gov/graphics/shared/statistics/yearbook/>. See also U.S. Department of Commerce, Bureau of the Census, *Statistical Abstracts of the United States*, Washington, DC, Government Printing Office, available at www.census.gov/statab/.

The Effects of Migration

Figure 9.4 illustrates the economics of labor migration. Assume that the world consists of two countries, the United States and Mexico, that are initially in isolation. The horizontal axes denote the total quantity of labor in the United States and Mexico, and the vertical axes depict the wages paid to labor. For each country, the demand schedule for labor is designated by the value of the marginal product (VMP) of labor.⁵ Also assume a fixed labor supply of seven workers in the United States, denoted by $S_{U.S_0}$, and seven workers in Mexico, denoted by S_{M_0} .

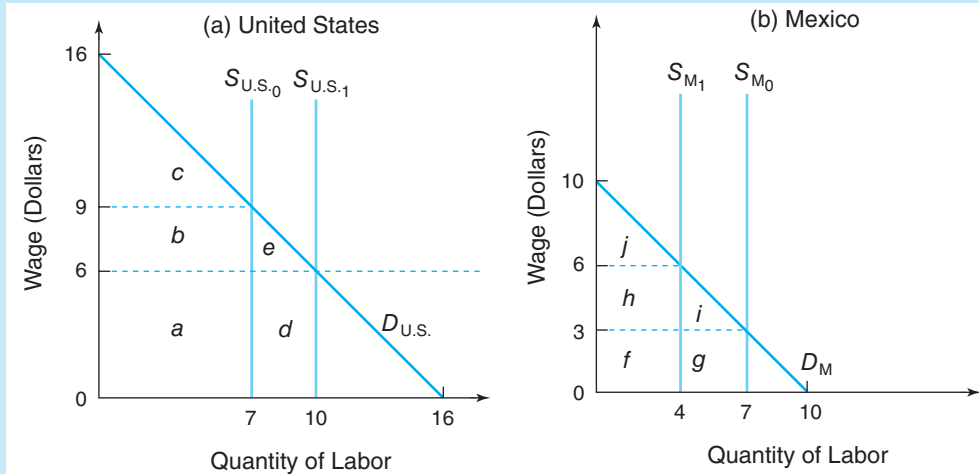
The equilibrium wage in each country is determined at the point of intersection of the supply and demand schedules for labor. In Figure 9.4(a), the U.S. equilibrium wage is \$9 and total labor income is \$63; this amount is represented by the area $a + b$. The remaining area under the labor demand schedule is area c , which equals \$24.50; this value represents the share of the nation's income accruing to owners of capital.⁶ In Figure 9.4(b) the equilibrium wage for Mexico is \$3; labor income totals \$21 represented by area $f + g$; capital owners enjoy incomes equaling area $h + i + j$; or \$24.50.

⁵The value of the marginal product of labor (VMP) refers to the amount of money producers receive from selling the quantity that was produced by the last worker hired; in other words, $VMP = \text{product price} \times \text{the marginal product of labor}$. The VMP curve is the labor demand schedule. This curve follows from an application of the rule that a business hiring under competitive conditions finds it most profitable to hire labor up to the point at which the price of labor (wage rate) equals its VMP. The location of the VMP curve depends on the marginal productivity of labor and the price of the product that it produces. Under pure competition, price is constant. Therefore, it is because of diminishing marginal productivity that the labor demand schedule is downward sloping.

⁶How do we know that area c represents the income accruing to U.S. owners of capital? My analysis assumes two productive factors, labor and capital. The total income (value of output) that results from using a given quantity of labor with a fixed amount of capital equals the area under the VMP curve of labor for that particular quantity of labor. Labor's share of that area is calculated by multiplying the wage rate times the quantity of labor hired. The remaining area under the VMP curve is the income accruing to the owners of capital.

FIGURE 9.4

Effects of Labor Migration from Mexico to the United States



Prior to migration, the wage rate in the United States exceeds that of Mexico. Responding to the wage differential, Mexican workers immigrate to the United States; this leads to a reduction in the Mexican labor supply and an increase in the U.S. labor supply. Wage rates continue to rise in Mexico and fall in the United States until they eventually are equalized. The labor migration hurts native U.S. workers but helps U.S. owners of capital; the opposite occurs in Mexico. Because migrant workers flow from uses of lower productivity to higher productivity, world output expands.

Suppose labor can move freely between Mexico and the United States and assume that migration is costless and occurs solely in response to wage differentials. Because U.S. wage rates are relatively high, there is an incentive for Mexican workers to migrate to the United States and compete in the U.S. labor market; this process will continue until the wage differential is eliminated. Imagine three workers migrate from Mexico to the United States. In the United States, the new labor supply schedule becomes $S_{U.S.1}$; the excess supply of labor at the \$9 wage rate causes the wage rate to fall to \$6. In Mexico, the labor emigration results in a new labor supply schedule at S_{M_1} ; the excess demand for labor at wage rate \$3 causes the wage rate to rise to \$6. The effect of **labor mobility** is to equalize wage rates in two countries.⁷

Our next job is to assess how labor migration in response to wage differentials affects the world economy's efficiency. Does world output expand or contract with open migration? For the United States, migration increases the labor supply from $S_{U.S.0}$ to $S_{U.S.1}$. This increase leads to an expansion of output; the value of the additional output is denoted by area $d + e$ (\$22.50). For Mexico, the decrease in labor supply from S_{M_0} to S_{M_1} results in a

⁷Wage rate equalization assumes unrestricted labor mobility in which workers are concerned only about their incomes. It also assumes that migration is costless for labor. In reality, there are economic and psychological costs of migrating to another country. Such costs may result in only a small number of persons' finding the wage gains in the immigrating country high enough to compensate them for their migration costs. Thus, complete wage equalization may not occur.

contraction in output; the value of the lost output is represented by area $g + i$ (\$13.50). The result is a net gain of \$9 in world output as a result of labor migration. This is because the VMP of labor in the United States exceeds that of Mexico throughout the relevant range. Workers are attracted to the United States by the higher wages. These higher wages signal to Mexican labor the higher value of worker productivity, attracting workers to those areas where they will be most efficient. As workers are used more productively, world output expands.

Migration also affects the *distribution of income*. As we will see, the gains in world income resulting from labor mobility are not distributed equally among all nations and factors of production. The United States as a whole benefits from immigration; its overall income gain is the sum of the losses by native U.S. workers, gains by Mexican immigrants now living in the United States, and gains by U.S. owners of capital. Mexico experiences overall income losses as a result of its labor emigration; however, workers remaining in Mexico gain relative to Mexican owners of capital. As previously suggested, the Mexican immigrants gain from their relocation to the United States.

For the United States, the gain in income as a result of immigration is denoted by area $d + e$ (\$22.50) in Figure 9.4(a). Of this amount, Mexican immigrants capture area d (\$18), while area e (\$4.50) is the extra income accruing to U.S. owners of capital thanks to the availability of additional labor to use with the capital. Immigration forces wage rates down from \$9 to \$6. The earnings of the native U.S. workers fall by area b (\$21); this amount is transferred to U.S. owners of capital.

As for Mexico, its labor emigration results in a decrease in income equal to $g + i$ (\$13.50); this decrease represents a transfer from Mexico to the United States. The remaining workers in Mexico gain area h (\$12) as a result of higher wages. However, Mexican capital owners lose because less labor is available for use with their capital.

Although immigration may lower wage rates for some native U.S. workers, it should also be noted that these lower wage rates benefit U.S. producers. Lower wage rates also result in lower equilibrium product prices, thereby benefiting consumers. From society's perspective, the gains from immigration to producers and consumers should be weighed against the losses to low-wage workers.

We can conclude that the effect of labor mobility is to increase overall world income and to redistribute income from labor to capital in the United States and from capital to labor in Mexico. Migration has an impact on the distribution of income similar to an increase in exports of labor-intensive goods from Mexico to the United States.

Immigration as an Issue

The preceding example makes it clear why domestic labor groups in capital-abundant nations often prefer restrictions on immigration; open immigration tends to reduce their wages. When migrant workers are unskilled, as is typically the case, the negative effect on wages mainly affects unskilled domestic workers. Conversely, domestic manufacturers will tend to favor unrestricted immigration as a source of cheap labor.

Another controversy about immigrants is whether they are a drain on government resources. Nations that provide generous welfare payments to the economically disadvantaged may fear they will induce an influx of nonproductive people who will not produce as did the immigrants of Figure 9.4, but enjoy welfare benefits at the expense of domestic residents and working immigrants. Fiscal relief may not be far away. The children of immigrants will soon enter the labor force and begin paying taxes, thus supporting not only their children's education, but also their parents' retirement. In a matter of two generations, most immigrant families tend to assimilate to the point that their

fiscal burdens are indistinguishable from those of other natives. When it's all added up, most long-run calculations show that immigrants make a net positive contribution to public coffers.

Developing nations have sometimes feared open immigration policies because they can result in a **brain drain**—emigration of highly educated and skilled people from developing nations to industrial nations, thus limiting the growth potential of the developing nations. The brain drain has been encouraged by national immigration laws, as in the United States and other industrial nations, that permit the immigration of skilled persons while restricting that of unskilled workers.

In the previous labor migration example, we implicitly assumed that the Mexican workers' migration decision was more or less permanent. In practice, most labor migration is temporary, especially in the European Union. A country such as France will allow the immigration of foreign workers on a temporary basis when needed; these workers are known as **guest workers**. During periods of business recession, France will refuse to issue work permits when foreign workers are no longer needed. Such a practice tends to insulate the French economy from labor shortages during business expansions and labor surpluses during business recessions. The labor adjustment problem is shifted to the labor emigrating countries.

Illegal migration is also a problem. In the United States, this type of migration has become a political hot potato, with millions of illegal immigrants finding employment in the so-called underground economy, often below minimum wage. Some 3 to 15 million illegal immigrants are estimated to be in the United States; many of them are from Mexico. For the United States and especially the western states, immigration of Mexican workers has provided a cheap supply of agricultural and low-skilled workers. For Mexico, it has been a major source of foreign exchange and a safety cushion against domestic unemployment. Illegal immigration also affects the distribution of income for U.S. natives because it tends to reduce the income of low-skilled U.S. workers. There is no consensus on the size of this impact.⁸

On the other hand, immigrants not only diversify an economy but may also contribute to economic growth. Because immigrants are often different from natives, the economy as a whole profits. In many instances, immigrants cause prices to fall, which benefits all consumers, and enable the economy to domestically produce a wider variety of goods than natives could alone. If immigrants weren't different from natives, they would only augment the population and scale of the economy, but not have an effect on the overall growth rate of per capita income. Immigration best enhances economic growth when immigrants are highly skilled, more innovative and entrepreneurial, attract capital, and work in occupations where native-born labor is scarce.

As we learned from Figure 9.4, immigrants increase the supply of labor in the economy. This results in a lower market wage for all workers *if all workers are the same*. But all workers are not the same. Some natives will compete with immigrants for positions because they possess similar skills; others will work alongside immigrants, complementing the immigrants' skills with their own. This skill distinction means that not all native workers will receive a lower wage. Those who compete with (are substitutes for) immigrants will receive a lower wage than they would without immigration, while those who complement immigrants will receive a higher wage. Most analyses of various countries have found that a

⁸Pia Orrenius and Madeline Zavodny, "From Brawn to Brains: How Immigration Works for America," *Annual Report*, Federal Reserve Bank of Dallas, 2010, pp. 4–17.

10 percent increase in the immigrant share of the population reduces native wages by 1–3 percent, suggesting that immigration has only a small effect on the lives of most Americans.⁹

Advocates of increased immigration note that children do not begin working the minute they are born. Producing an adult worker requires substantial expenditures in the form of food, clothing, shelter, education, and other child-rearing costs. These investments in human capital formation are quite substantial. Immigrant workers, unlike newborn children, are able to begin engaging in productive activities upon their arrival in the country. The cost of much of their human capital formation was borne by the country from which they emigrated. Because most immigrants arrive at a stage in their life in which they are relatively productive, higher immigration rates generally result in an increase in the proportion of the population that is working. As the proportion of the population that is working rises, per capita income also rises.

Concern over the future of Social Security is also used to support relaxed immigration restrictions. Declining birthrates in the United States, combined with rising life spans, result in a steady increase in the ratio of retired to working individuals over the next few decades. An increase in the number of younger immigrants could help to alleviate this problem.

Does Canada's Immigration Policy Provide a Model for the United States?

Like the United States, Canada is a country where immigration is an important contributor to its society and culture. Having a sparse population and an abundance of unsettled land, Canada enacted a liberal immigration policy that is motivated by a desire for economic expansion. Today, the goal of the immigration system is to encourage youthful, bilingual, high-skill immigration in order to build human capital within Canada's aging labor force. Canada's immigration policy puts in place incentives to treat foreign workers not as foes but as friends whose labor and skills are essential to the economy.

Canada currently solicits immigrants from more than 200 countries of origin, with China, India, and the Philippines being the most important contributors. Immigration population growth is concentrated in or near large cities such as Montreal, Toronto, and Vancouver. Canada today has one of the highest immigration rates in the world. For the past two decades, it has admitted about 250,000 newcomers a year—about 1 percent of its population.

In Canada, there are three categories of immigrants: closely related persons of Canadian residents living in Canada, skilled workers and business people who fit labor market needs, and people accepted as immigrants for humanitarian reasons or who are escaping persecution or unusual punishment in their homelands. To determine whom it should allow in, Canada uses a point system. You do not need a job or an employer, just skills. Applicants are awarded points for English or French language abilities, education, and job experience.

Canada's immigration program is run by both provincial governments and the federal government in Ottawa. Provinces can sponsor a limited number of worker-based residencies

⁹G. Borjas, *We Wanted Workers: Unraveling the Immigration Narrative*, New York, Norton, 2016; D. Card, "Is the New Immigration Really So Bad?" *Economic Journal*, Vol. 115, November 2005, pp. F300–F323; and R. M. Friedberg and J. Hunt, "The Impact of Immigrants on Host Country Wages, Employment and Growth," *Journal of Economic Perspectives* (Spring 1995), pp. 23–44.

each year, based on population. Each province can select whomever it wants for whatever reason. The federal government cannot question either the provinces criteria or their methods of recruitment; its role is limited to conducting a security, criminal, and health check on foreigners picked by the provinces. The federal government issues limited numbers of permanent residencies for skilled workers each year as well as providing temporary worker admissions to Canada in industries including hospitality, food construction, manufacturing, and oil and natural gas extraction.

Why has Canada accepted immigrants with open arms? Because it must. Canadians realize the positive benefits of immigration including economic development and the creation of jobs for native-born Canadians. This is because a large proportion of Canadian immigrants are highly skilled people who are net contributors to the economy. Also, with a sparse population and low birth rate, Canada needs immigrants for population growth and economic development.

About two-thirds of Canada's permanent visas are granted for Canada's economic needs, including the filling of labor shortages; in contrast, about two-thirds of U.S. green cards are granted for family reunions. Canadians consider multiculturalism as a key ingredient of their national identity. They contend that people who are exposed to different viewpoints and cultures are more likely to cooperate with one another or reach a compromise when differences occur and become more productive by learning from others. Canadians generally see immigration as adding to the social fabric of the country. Finally, Canada has little reason to fear illegal immigration. Although Canada and the United States share a long border, millions of Americans do not wish to move to Canada. In other words, the United States serves as a buffer zone for unauthorized immigration that reduces Canadian anxiety about it.

Canada emphasizes open immigration policies that accept talented foreigners who have the skills the country needs and the desire to succeed. Canada has transformed itself into an immigrant country, with a foreign-born population (20 percent) exceeding that of the United States (13 percent). Most Canadians feel that this infusion of talent has added to the economic vitality of Canada.

In 2013, Canada began to overhaul its immigration program and place greater emphasis on factors such as an applicant's job skills and fluency in French or English. The objective is to fix what the Canadian government sees as an increasing economic division between locals and many of the immigrants that Canada selected under the former system, whereby immigrants have fallen behind locals in terms of wages. The new system considers whether immigrants have employment arranged in Canada and if they have specific skills in demand such as data processing. Canada also considers adaptability, which includes factors such as time spent previously in Canada.

Canada has never had much of a problem with undocumented immigrants, thanks to its geographic isolation. Whereas almost a third of the current foreign-born population in the United States is undocumented, the figure is no more than 6 percent in Canada.¹⁰

¹⁰Jonathan Tepperman, "Immigration, Canadian Style," *The Wall Street Journal*, September 17, 2016; Alistair MacDonald, "As Disparities Grow, Canada Tightens Its Immigration Rules," *The Wall Street Journal*, August 31, 2013; A. E. Challinor, *Canada's Immigration Policy: A Focus on Human Capital*, Migration Policy Institute, Washington, DC, September 2011; Fareed Zakaria, *Global Lessons: The GPS Roadmap for Making Immigration Work*, CNN TV Special, June 10, 2012; and E. G. Austin, "Immigration: The United States v Canada," *The Economist*, May 20, 2011.

INTERNATIONAL TRADE APPLICATION

Does U.S. Immigration Policy Harm Domestic Workers?

Does U.S. immigration policy harm domestic workers? Some analysts maintain that the overall benefits from immigration are small, so it is doubtful these benefits play an important role in the policy debate. Others maintain that immigration has significant effects on the economy. They note that highly skilled immigrants help create jobs for domestic workers while less skilled workers fill jobs most Americans do not desire, such as cooking in restaurants, picking apples and cherries, and cleaning offices, adding to the economic vitality of the nation.

Most U.S. residents today are the descendants of immigrants who arrived in the United States during the past 150 years. Concerns about the effect of immigration on domestic workers, however, have resulted in the passage of several laws designed to restrict immigration. Unions in particular have argued for a more restrictive immigration policy on the grounds that immigration lowers the wage and employment levels for domestic residents.

No substantial restrictions were placed on immigration into the United States until the passage of the Quota Law of 1921. This law set quotas on the number of immigrants based on the country of origin. The Quota Law primarily restricted immigration from eastern and southern Europe. The Immigration and Nationality Act Amendments of



1965 eliminated the country-specific quota system and instead established a limit on the maximum number of immigrants allowed into the United States. Under this act, preferential treatment is given to those who immigrate for the purpose of family reunification. Those possessing exceptional skills are also given priority. No limit is placed on the number of political refugees allowed to immigrate into the United States. Not all immigrants enter the country through legal channels. Individuals often enter on student or tourist visas and begin working in violation of their visa status. Other individuals enter the country illegally without a valid U.S. visa. The Immigration Reform and Control Act of 1986 addresses the issue of illegal immigration by imposing substantial fines on employers that hire illegal immigrants.

The Illegal Immigration Reform and Immigrant Responsibility Act of 1996 provided several new restrictions to immigration. Host families can only accept immigrants if the host family receives an income that is at least 125 percent of the poverty level. This act also requires the Immigration and Naturalization Service to maintain stricter records of entry and exit by nonresident aliens.

What do you think? What would you do to revise the U.S. system of immigration?

SUMMARY

1. Today the world economy is characterized by the international movement of factor inputs. The multinational enterprise plays a central part in this process.
2. There is no single agreed upon definition of what constitutes an MNE. Some of the most identifiable characteristics of multinationals are the following: (a) Stock ownership and management are multinational in character; (b) company headquarters may be far removed from the country where a particular activity occurs; and (c) foreign sales represent a high proportion of total sales.
3. Multinationals have diversified their operations along vertical, horizontal, and conglomerate lines.
4. Among the major factors that influence decisions to undertake foreign direct investment are (a) market demand, (b) trade restrictions, (c) investment regulations, and (d) labor productivity and costs.
5. In planning to set up overseas operations, a business must decide whether to construct (or purchase) plants abroad or extend licenses to foreign businesses to produce its goods.
6. The theory of multinational enterprise essentially agrees with the predictions of the comparative

advantage principle. However, conventional trade theory assumes that commodities are traded between independent, competitive businesses, whereas MNEs are often vertically integrated businesses, with substantial intra-firm sales. Thus, MNEs may use transfer pricing to maximize overall company profits rather than the profits of any single subsidiary.

- In recent years, companies have increasingly linked with former rivals in a vast array of joint ventures. International joint ventures can yield welfare-increasing effects as well as market power effects.

- Some of the more controversial issues involving MNEs are (a) employment, (b) technology transfer, (c) national sovereignty, (d) balance-of-payments, and (e) taxation.
- International labor migration occurs for economic and noneconomic reasons. Migration increases output and decreases wages in the country of immigration, as it decreases output and increases wages in the country of emigration. For the world as a whole, migration leads to net increases in output.

KEY CONCEPTS AND TERMS

Brain drain (p. 337)

Conglomerate integration (p. 313)

Country risk analysis (p. 318)

Foreign direct investment (p. 313)

Guest workers (p. 337)

Horizontal integration (p. 312)

International joint ventures

(p. 323)

Labor mobility (p. 335)

Migration (p. 333)

Multinational enterprise (MNE)

(p. 311)

Technology transfer (p. 328)

Transfer pricing (p. 331)

Transplants (p. 321)

Vertical integration (p. 312)

STUDY QUESTIONS

- Multinational enterprises may diversify their operations along vertical, horizontal, and conglomerate lines within the host and source countries. Distinguish among these diversification approaches.
- What are the major foreign industries in which U.S. businesses have chosen to place direct investments? What are the major industries in the United States in which foreigners place direct investments?
- Why is it that the rate of return on U.S. direct investments in the developing nations often exceeds the rate of return on its investments in industrial nations?
- What are the most important motives behind an enterprise's decision to undertake foreign direct investment?
- What is meant by the term *multinational enterprise*?
- Under what conditions would a business wish to enter foreign markets by extending licenses or franchises to local businesses to produce its goods?
- What are the major issues involving multinational enterprises as a source of conflict for source and host countries?
- Is the theory of multinational enterprise essentially consistent or inconsistent with the traditional model of comparative advantage?
- What are some examples of welfare gains and welfare losses that can result from the formation of international joint ventures among competing businesses?
- What effects does labor migration have on the country of immigration? The country of emigration? The world as a whole?
- Table 9.6 illustrates the revenue conditions facing ABC, Inc. and XYZ, Inc. that operate as competitors in the U.S. calculator market. Each firm realizes constant long-run costs ($MC = AC$) of \$4 per unit. On graph paper, plot the enterprise demand, marginal revenue, and $MC = AC$ schedules. On the basis of this information, answer the following questions.
 - With ABC and XYZ behaving as competitors, the equilibrium price is _____ and output is _____. At the equilibrium price, U.S. households attain \$_____ of consumer surplus, while company profits total \$_____.

TABLE 9.6**Price and Marginal Revenue: Calculators**

Quantity	Price (\$)	Marginal Revenue (\$)
0	9	—
1	8	8
2	7	6
3	6	4
4	5	2
5	4	0
6	3	-2
7	2	-4

- b. Suppose the two organizations jointly form a new one, JV, Inc., whose calculators replace the output sold by the parent companies in the U.S. market. Assuming that JV operates as a monopoly and its costs ($MC = AC$) equal \$4 per unit, the company's output would be _____ at a price of \$_____, and total profit would be \$_____. Compared to the market equilibrium position achieved by ABC and XYZ as competitors, JV as a monopoly leads to a deadweight loss of consumer surplus equal to \$_____, while payments to U.S. capital owners equal \$_____.
- c. Assume now that the formation of JV yields technological advances that result in a cost per unit of only \$2; sketch the new $MC = AC$ schedule in the figure. Realizing that JV results in a deadweight loss of consumer surplus, as described in part *b*, the net effect of the formation of JV on U.S. welfare is a gain/loss of \$_____. If JV's cost reduction was because of the wage concessions of JV's U.S. employees, the net welfare gain/loss for the United States would equal \$_____. If JV's cost reductions resulted from changes in work rules leading to

higher worker productivity, the net welfare gain/loss for the United States would equal \$_____.

12. Table 9.7 illustrates the hypothetical demand and supply schedules of labor in the United States. Assume that labor and capital are the only two factors of production. On graph paper, plot these schedules.

TABLE 9.7**Demand and Supply of Labor**

Wage (\$)	Quantity Demanded	Quantity Supplied ₀	Quantity Supplied ₁
8	0	2	4
6	2	2	4
4	4	2	4
2	6	2	4
0	8	2	4

- a. Without immigration, suppose the labor force in the United States is denoted by schedule S_0 . The equilibrium wage rate is \$_____; payments to native U.S. workers total \$_____, while payments to U.S. capital owners equal \$_____.
- b. Suppose immigration from Hong Kong results in an overall increase in the U.S. labor force to S_1 . Wages would rise/fall to \$_____, payments to native U.S. workers would total \$_____, and payments to Hong Kong immigrants would total \$_____. U.S. owners of capital would receive payments of \$_____.
- c. Which U.S. factor of production would gain from expanded immigration? Which U.S. factor of production would likely resist policies permitting Hong Kong workers to freely migrate to the United States?

PART

2

International Monetary Relations



CHAPTER 10

The Balance-of-Payments



When trade occurs between the United States and other nations, many types of financial transactions are recorded in a summary called the balance-of-payments. In this chapter, we examine the monetary aspects of international trade by considering the nature and significance of a nation's balance-of-payments.

The **balance-of-payments** is a record of the economic transactions between the residents of one country and the rest of the world. Nations keep a record of their balance-of-payments over the course of a one-year period; the United States and some other nations also keep such a record on a quarterly basis.

An *international transaction* is an exchange of goods, services, or assets between residents of one country and those of another. But what is meant by the term *resident*? Residents include businesses, individuals, and government agencies that make the country in question their legal domicile. Although a corporation is considered to be a resident of the country in which it is incorporated, its overseas branch or subsidiary is not. Military personnel, government diplomats, tourists, and workers who emigrate temporarily are considered residents of the country in which they hold citizenship.

Double Entry Accounting

The arrangement of international transactions into a balance-of-payments account requires that each transaction be entered as a credit or a debit. A **credit transaction** is one that results in a *receipt* of a payment from foreigners. By convention, credit items are recorded with a *plus* sign. A **debit transaction** is one that leads to a *payment* to foreigners. This distinction is clarified when we assume that transactions take place between U.S. residents and foreigners and that all payments are financed in dollars. By convention, debit items are recorded with a *minus* sign (–).

From the U.S. perspective, the following transactions are credits (+), leading to the receipt of dollars from foreigners:

- Merchandise exports
- Transportation and travel receipts
- Income received from investments abroad
- Gifts received from foreign residents
- Aid received from foreign governments
- Investments in the United States by overseas residents

Conversely, the following transactions are debits (–) from the U.S. viewpoint because they involve payments to foreigners:

- Merchandise imports
- Transportation and travel expenditures
- Income paid on the investments of foreigners
- Gifts to foreign residents
- Aid given by the U.S. government
- Overseas investment by U.S. residents

Although we speak in terms of credit and debit transactions, every international transaction involves an exchange of assets and has both a credit and a debit side. Each credit entry is balanced by a debit entry, and vice versa, so that the recording of any international transaction leads to two offsetting entries. In other words, the balance-of-payments accounts utilize a **double entry accounting** system. The following two examples illustrate the double entry technique.

Example 1 IBM sells \$25 million worth of computers to a German importer. Payment is made by a bill of exchange that increases the balances of New York banks at their Bonn correspondents' bank. Because the export involves a transfer of U.S. assets abroad for which payment is to be received, it is entered in the U.S. balance-of-payments as a credit transaction. IBM's receipt of the payment held in the German bank is classified as a short-term financial movement because the financial claims of the United States against the German bank have increased. The entries on the U.S. balance-of-payments would appear as follows:

	Credits (+)	Debits (–)
Merchandise exports	\$25 million	
Short-term financial movement		\$25 million

Example 2 A U.S. resident who owns bonds issued by a Japanese company receives interest payments of \$10,000. With payment, the balances owned by New York banks at their Tokyo affiliate are increased. The impact of this transaction on the U.S. balance-of-payments would be as follows:

	Credits (+)	Debits (–)
Income receipts	\$10,000	
Short-term financial movement		\$10,000

These examples illustrate how every international transaction has two equal sides, a credit and a debit. If we add up all the credits as pluses and all the debits as minuses, the net result is zero; the total credits must always equal the total debits. This result means that the

total balance-of-payments account must always be in balance. There is no such thing as an overall balance-of-payments surplus or deficit.

Even though the entire balance-of-payments must numerically balance by definition, it does *not* necessarily follow that any single subaccount or subaccounts of the statement must balance. Total merchandise exports may or may not be in balance with total merchandise imports. When reference is made to a balance-of-payments surplus or deficit, it is particular subaccounts of the balance-of-payments that are referred to, not the overall value. A *surplus* occurs when the balance on a subaccount(s) is positive; a *deficit* occurs when the balance is negative.

Balance-of-Payments Structure

Let us now consider the structure of the balance-of-payments by examining its various subaccounts.

Current Account

The **current account** of the balance-of-payments refers to the monetary value of international flows associated with transactions in goods, services, income flows, and unilateral transfers. Each of these flows will be described in turn.

Merchandise trade includes all of the goods the United States exports or imports: agricultural products, machinery, autos, petroleum, electronics, textiles, and the like. The dollar value of merchandise exports is recorded as a plus (credit), and the dollar value of merchandise imports is recorded as a minus (debit). Combining the exports and imports of goods gives the **merchandise trade balance**. When this balance is negative, the result is a merchandise trade deficit; a positive balance implies a merchandise trade surplus.

Exports and imports of *services* include a variety of items. When U.S. ships carry foreign products or foreign tourists spend money at U.S. restaurants and motels, valuable services are being provided by U.S. residents who must be compensated. Such services are considered exports and are recorded as credit items on the goods and services account. Conversely, when foreign ships carry U.S. products or when U.S. tourists spend money at hotels and restaurants abroad, then foreign residents are providing services that require compensation. Because U.S. residents are importing these services, the services are recorded as debit items. Insurance and banking services are explained in the same way. Services also include items such as transfers of goods under military programs, construction services, legal services, technical services, and the like.

To get a broader understanding of the international transactions of a country, we must add services to the merchandise trade account. This total gives the **goods and services balance**. When this balance is positive, the result is a surplus of goods and services transactions; a negative balance implies a deficit. Just what does a surplus or deficit balance appearing on the U.S. goods and services account mean? If the goods and services account shows a surplus, the United States has transferred more resources (goods and services) to foreigners than it has received from them over the period of one year. Besides measuring the value of the *net transfer of resources*, the goods and services balance also furnishes information about the status of a nation's gross domestic product (GDP). This is because the balance on the goods and services account is defined essentially the same way as the *net export of goods and services* that is part of a nation's GDP.

Recall from your macroeconomics course that GDP is equal to the value of the goods and services produced in an economy over a period of time. In an economy with trade, GDP is equal to the sum of four types of spending in the economy: consumption, gross investment, government spending, and net exports of goods and services. In effect, net

exports represent the value of goods and services that are produced domestically but not included in domestic consumption.

For a nation's GDP, then, the balance on the goods and services account can be interpreted as follows. A positive balance on the account shows an excess of exports over imports, and this difference must be added to the GDP. When the account is in deficit, the excess of imports over exports must be subtracted from the GDP. If a nation's exports of goods and services equal its imports, the account will have a net imbalance of zero and not affect the status of the GDP. Therefore, depending on the relative value of exports and imports, the balance on the goods and services account contributes to the level of a nation's national product.

Broadening our balance-of-payments summary further, we must include the **income balance** that consists of *income receipts and payments*. This item refers to the net earnings (dividends and interest) on U.S. investments abroad—earnings on U.S. investments abroad less payments on foreign assets in the United States. It also includes compensation to employees.

Our balance-of-payments summary is expanded to include **unilateral transfers**. These items include transfers of goods and services (gifts in kind) or financial assets (money gifts) between the United States and the rest of the world. *Private transfer payments* refer to gifts made by individuals and nongovernmental institutions to foreigners. These might include a remittance from an immigrant living in the United States to relatives back home, a birthday present sent to a friend overseas, or a contribution by a U.S. resident to a relief fund for underdeveloped nations. *Governmental transfers* refer to gifts or grants made by one government to foreign residents or foreign governments. The U.S. government makes transfers in the form of money and capital goods to developing nations, military aid to foreign governments, and remittances such as retirement pensions to foreign workers who have moved back home. In some cases, U.S. governmental transfers represent payments associated with foreign assistance programs that can be used by foreign governments to finance trade with the United States. It should be noted that many U.S. transfer (foreign aid) programs are tied to the purchase of U.S. exports (such as military equipment or farm exports) and thus represent a subsidy to U.S. exporters. When investment income and unilateral transfers are combined with the balance on goods and services, we arrive at the current account balance. This is the broadest measure of a nation's balance-of-payments regularly quoted in the newspapers and in national television and radio news reports.

INTERNATIONAL FINANCE APPLICATION

International Payments Process

When residents in different countries contemplate selling or buying products, they must consider how payments will occur, as seen in Figure 10.1. Assume that you, as a resident of the United States, buy a TV directly from a producer in South Korea. How, when, and where will the South Korean producer obtain his *won* so that he can spend the money in South Korea?



Initially you would write a check for \$300 that your U.S. bank would convert to 210,000 won (assuming an exchange rate of 700 won per dollar). When the South Korean producer receives your payment in won, he deposits the funds in his bank. The bank in South Korea holds a check from a U.S. bank that promises to pay a stipulated amount of won.

(continued)

Assume that at the same time you paid for your TV, a buyer in South Korea paid a U.S. producer \$300 for machinery. The flowchart illustrates the path of both transactions.

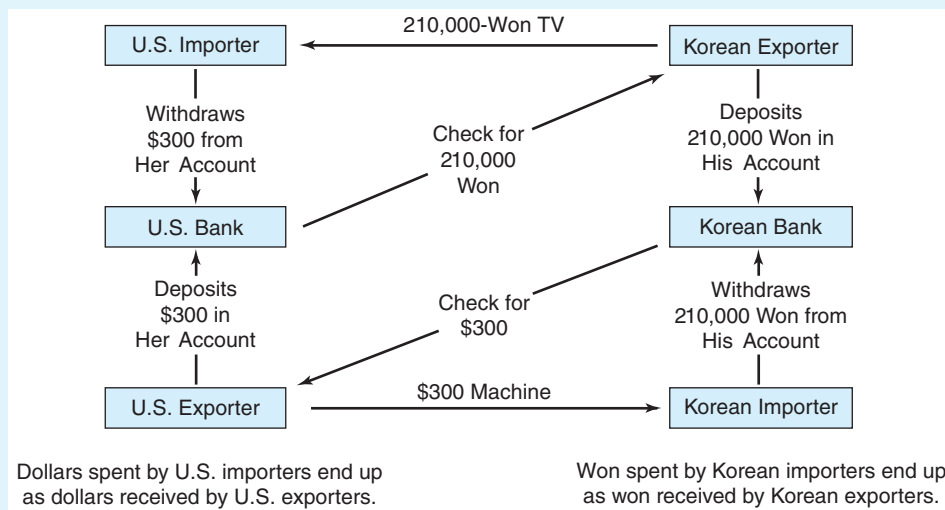
When trade is in balance, money of different countries does not actually change hands across the oceans. In this example, the value of South Korea's exports to the United States equals the value of South Korea's imports from the United States; the won that South Korean importers use to purchase dollars to pay for U.S. goods are equal to the

won that South Korean exporters receive in payment for the products they ship to the United States. The dollars that would flow, in effect, from U.S. importers to U.S. exporters exhibit a similar equality.

In theory, importers in a country pay the exporters in that same country in the national currency. In reality, however, importers and exporters in a given country do not deal directly with one another; to facilitate payments, banks carry out these transactions.

FIGURE 10.1

International Payments Process



Capital and Financial Account

Capital and financial transactions in the balance-of-payments include all international purchases or sales of assets. The term *assets* is broadly defined to include items such as titles to real estate, corporate stocks and bonds, government securities, and ordinary commercial bank deposits. The **capital and financial account**¹ includes both private sector and official (central bank) transactions.

Capital transactions consist of capital transfers and the acquisition and disposal of certain nonfinancial assets. The major types of capital transfers are debt forgiveness and migrants' goods and financial assets accompanying them as they leave or enter the country. The acquisition and disposal of certain nonfinancial assets include the sales and purchases

¹Since 1999, U.S. international transactions have been classified into three groups—the current account, the capital account, and the financial account. The transactions were formerly classified into the current account and capital account. See “Upcoming Changes in the Classification of Current and Capital Transactions in the U.S. International Accounts,” *Survey of Current Business*, February 1999.

of rights to natural resources, patents, copyrights, trademarks, franchises, and leases. Though conceptually important, capital transactions are generally small in U.S. accounts and thus will not be emphasized in this chapter.

Private Sector Financial Transactions The vast majority of transactions appearing in the capital and financial account come from financial transactions. The following are examples of private sector financial transactions:

- **Direct Investment.** Direct investment occurs when residents of one country acquire a controlling interest (stock ownership of 10 percent or more) in a business enterprise in another country.
- **Securities.** Securities are private sector purchases of short- and long-term debt securities such as Treasury bills, Treasury notes, Treasury bonds, and securities of private enterprises.
- **Bank Claims and Liabilities.** Bank claims consist of loans, overseas deposits, acceptances, foreign commercial paper, claims on affiliated banks abroad, and foreign government obligations. Bank liabilities include demand deposits and NOW (negotiable order of withdrawal) accounts, passbook savings deposits, certificates of deposit, and liabilities to affiliated banks abroad.

Capital and financial transactions are recorded in the balance-of-payments statement by applying a plus sign (credit) to capital and financial inflows and a minus sign (debit) to capital and financial outflows. For the United States, a *financial inflow* might occur under the following circumstances: (1) U.S. liabilities to foreigners rise (for example, a French resident purchases securities of IBM); (2) U.S. claims on foreigners decrease (Citibank receives repayment for a loan it made to a Mexican enterprise); (3) foreign-held assets in the United States rise (Toyota builds an auto assembly plant in the United States); or (4) U.S. assets overseas decrease (Coca-Cola sells one of its Japanese bottling plants to a Japanese buyer). A *financial outflow* would imply the opposite.

The following rule may be helpful in appreciating the fundamental difference between credit and debit transactions that make up the capital and financial account. Any transaction that leads to the home country's receiving payments from foreigners can be regarded as a credit item. A capital (financial) inflow can be likened to the *export* of goods and services. Conversely, any transaction that leads to foreigners' receiving payments is considered a debit item for home countries. A capital (financial) outflow is similar in effect to the *import* of goods and services.

Official Settlements Transactions Besides including private sector transactions, the capital and financial account includes **official settlements transactions** of the home country's central bank. Official settlements transactions refer to the movement of financial assets among official holders (for example, the U.S. Federal Reserve and the Bank of England). These financial assets fall into two categories: official reserve assets (U.S. government assets abroad) and liabilities to foreign official agencies (foreign official assets in the United States).

Official holdings of reserves are used for two purposes. First, they afford a country sufficient international liquidity to finance short-run trade deficits and weather periodic currency crises. This liquidity function is usually only important to developing countries that do not have a readily convertible currency or ready access to international capital markets on favorable terms. Second, central banks sometimes buy or sell official reserve assets in private sector markets to stabilize their currencies' exchange rates. When the United States desires to support the value of the dollar in foreign exchange markets, it would sell, say, foreign currencies or gold to buy dollars; this fosters an increase in the

demand for the dollar and an increase in its exchange value. Conversely, if the United States wanted to promote a weaker dollar, it would sell dollars and buy foreign currencies or gold; this would add to the supply of the dollar and cause its exchange value to decrease. In practice, the United States currently has a managed floating exchange rate that usually requires negligible foreign exchange intervention. Therefore, changes in its official reserve assets tend to be small. This topic is further discussed in Chapter 15.

The **official reserve assets** of the United States include gold, foreign currencies, special drawing rights (see next section), and reserve position in the International Monetary Fund. Official settlements transactions also include liabilities to foreign official holders. These liabilities refer to foreign official holdings with U.S. commercial banks and official holdings of U.S. government securities. Foreign governments often wish to hold such assets because of the interest earnings they provide. Table 10.1 shows the major foreign holders of U.S. government securities.

TABLE 10.1**Selected Foreign Holders of U.S. Securities as of 2016**

Country	Billions of Dollars	Percentage of World Total
Japan	1,959	11.4
China	1,630	9.5
Cayman Islands	1,524	8.9
United Kingdom	1,427	8.3
Luxembourg	1,349	7.9
Canada	950	5.5
Ireland	931	5.4
Switzerland	742	4.3
World Total	17,139	

Source: U.S. Treasury Department, *Report on Foreign Portfolio Holdings of U.S. Securities as of June 30, 2016*.

Special Drawing Rights

The previous section included special drawing rights as a source of official reserves. What are **special drawing rights**?

In the 1960s, countries were concerned about the adequacy of international reserves and whether the supply of reserves could increase as rapidly as the demand for them. At that time, international reserves consisted of gold, foreign currencies, and reserve positions in the International Monetary Fund. What was needed was an international reserve asset that would be acceptable to all countries and one whose supply could be expanded as the demand for reserves rose.

In 1969 a new reserve asset was created by the International Monetary Fund (IMF) as a supplement to the existing reserves of member countries. Termed special drawing rights (SDRs), this asset can be transferred among participating nations in settlement of balance-of-payments deficits or stabilization of exchange rates. If Malaysia needs to obtain British pounds to finance a deficit, it can do so by trading SDRs for pounds held by some other country that the IMF designates, say Canada. In addition to pounds, SDRs can also be exchanged for U.S. dollars, Japanese yen, and euros. The SDR is used only by governments; private parties do not hold or use them. According to IMF policy, member countries are allocated SDRs in proportion to their relative positions in the world economy. The IMF has created additional amounts of SDRs on several occasions since 1970.

The value of the SDR is defined as a basket of currencies that includes the U.S. dollar, Japanese yen, U.K. pound, and the euro. The weights of the currencies in the basket are based on the value of the exports of goods and services and the amount of reserves denominated in the respective currencies that were held by other members of the IMF during the previous five years. As of 2016, the weights in the basket were: the U.S. dollar = 42 percent, the euro = 35 percent, the yen = 12 percent, and the pound = 11 percent. The latest value of the SDR can be found on the IMF's Web site, which is updated daily.

Statistical Discrepancy: Errors and Omissions

The data collection process that underlies the published balance-of-payments figures is far from perfect. The cost of collecting balance-of-payments statistics is high, and a perfectly accurate collection system would be prohibitive in cost. Government statisticians thus base their figures partly on information collected and estimates. Probably the most reliable information consists of merchandise trade data that are collected mainly from customs records. Capital and financial account information is derived from reports by financial institutions indicating changes in their liabilities and claims to foreigners; these data are not matched with specific current account transactions. Because statisticians do not have a system whereby they can simultaneously record the credit and debit side of each transaction, such information for any particular transaction tends to come from different sources. Large numbers of transactions fail to get recorded.

When statisticians sum the credits and debits, it is not surprising when the two totals do not match. Because total debits must equal total credits in principle, statisticians insert a *residual* to make them equal. This correcting entry is known as **statistical discrepancy**, or errors and omissions. In the balance-of-payments statement, statistical discrepancy is treated as part of the capital and financial account because short-term financial transactions are generally the most frequent source of error.

U.S. Balance-of-Payments

The method the U.S. Department of Commerce uses in presenting balance-of-payments statistics is shown in Table 10.2. This format groups specific transactions together along functional lines to provide analysts with information about the impact of international transactions on the domestic economy. The *partial balances* published on a regular basis

TABLE 10.2

U.S. Balance-of-Payments, 2016 (Billions of Dollars)

Current Account		Capital and Financial Account	
Merchandise trade balance	-749.9	U.S. net borrowing measured by capital-financial account transactions	406.5
Exports	1,459.7		
Imports	-2,209.6	Statistical discrepancy	74.7
Services balance	249.3	Balance on capital and financial account	481.2
Goods and services balance	-500.6		
Income receipts and payments balance	180.6		
Unilateral transfers balance	-161.2		
Current account balance	-481.2		

Source: From U.S. Department of Commerce, *Survey of Current Business*, June 2017. See also Bureau of Economic Analysis, *U.S. International Transactions Accounts Data* at <http://www.bea.gov/> and *Economic Report of the President*.

include the merchandise trade balance, the balance on goods and services, the current account balance, and information about capital and financial transactions.

The *merchandise trade balance*, commonly referred to as the **trade balance** by the news media, is derived by computing the net exports in the merchandise accounts. Owing to its narrow focus on traded goods, the merchandise trade balance offers limited policy insight. The popularity of the merchandise trade balance is largely because of its availability on a monthly basis. Merchandise trade data can rapidly be gathered and reported, whereas measuring trade in services requires time-consuming questionnaires.

As seen in Table 10.2, the United States had a merchandise trade deficit of $-\$749.9$ billion in 2016, resulting from the difference between U.S. merchandise exports ($\$1,459.7$ billion) and U.S. merchandise imports ($-\$2,209.6$ billion). Recall that exports are recorded with a plus sign and imports are recorded with a minus sign. The United States was a net importer of merchandise in 2016. Table 10.3 shows that the United States has consistently faced merchandise trade deficits in recent decades. This situation contrasts with the 1950s and 1960s, when merchandise trade surpluses were common for the United States.

TABLE 10.3**U.S. Balance-of-Payments, 1980–2016 (Billions of Dollars)**

Year	Merchandise Trade Balance	Services Balance	Goods and Services Balance	Income Receipts and Payments Balance	Unilateral Transfers Balance	Current Account Balance
1980	-25.5	6.1	-19.4	30.1	-8.3	2.4
1984	-112.5	3.3	-109.2	30.0	-20.6	-99.8
1988	-127.0	12.2	-114.8	11.6	-25.0	-128.2
1992	-96.1	55.7	-40.4	4.5	-32.0	-67.9
1996	-191.3	87.0	-104.3	17.2	-42.1	-129.2
2000	-452.2	76.5	-375.7	-14.9	-54.1	-444.7
2004	-665.4	47.8	-617.6	30.4	-80.9	-668.1
2008	-820.8	139.7	-681.1	127.6	-119.7	-673.2
2012	-735.3	195.8	-539.5	198.6	-134.1	-475.0
2016	-749.9	249.3	-500.6	180.6	-161.2	-481.2

Source: From U.S. Department of Commerce, *Survey of Current Business*, various issues.

Trade deficits generally are not popular with domestic residents and policy makers because they tend to exert adverse consequences on the home nation's terms of trade and employment levels, as well as on the stability of the international money markets. For the United States, economists' concerns over persistent trade deficits have often focused on their possible effects on the terms at which the United States trades with other nations. With a trade deficit, the value of the dollar may fall in international currency markets as dollar-out payments exceed dollar-in payments. Foreign currencies would become more expensive in terms of dollars so that imports would become more costly to U.S. residents. A trade deficit that induces a decrease in the dollar's international value imposes a real cost on U.S. residents in the form of higher import costs.

Another often publicized consequence of a trade deficit is its adverse impact on employment levels in certain domestic industries such as steel or autos. A worsening trade balance may injure domestic labor, not only by the number of jobs lost to foreign workers who

produce our imports but also by the employment losses due to deteriorating export sales. It is no wonder that home nation unions often raise the most vocal arguments about the evils of trade deficits for the domestic economy. Keep in mind that a nation's trade deficit that leads to decreased employment in some industries is offset by capital and financial account inflows that generate employment in other industries. Rather than determining total domestic employment, a trade deficit influences the distribution of employment among domestic industries.

Discussion of U.S. competitiveness in merchandise trade often gives the impression that the United States has consistently performed poorly relative to other industrial nations. The merchandise trade deficit is a narrow concept, because goods are only part of what the world trades. A better indication of the nation's international payments position is the *goods and services balance*. Table 10.2 shows that in 2016, the United States generated a surplus of \$249.3 billion on service transactions. Combining this surplus with the merchandise trade deficit of $-\$749.9$ billion yields a deficit on the goods and services balance of $-\$500.6$ billion. This deficit means that the United States transferred fewer resources (goods and services) to other nations than it received from them during 2016; that is, U.S. net exports were negative.

In recent decades, the United States has generated a surplus in its services account, as seen in Table 10.3. The United States has been competitive in services categories such as transportation, construction, engineering, brokers' commissions, and certain health care services. The United States also has traditionally registered large net receipts from transactions involving proprietary rights—fees, royalties, and other receipts derived mostly from long established relations between U.S.-based parent companies and their affiliates abroad.

Adjusting the balance on goods and services for income receipts and payments and net unilateral transfers gives the balance of the current account. As Table 10.2 shows, the United States had a *current account* deficit of $-\$481.2$ billion in 2016. This deficit means that an excess of imports over exports—of goods, services, income flows, and unilateral transfers—resulted in decreasing net foreign investment for the United States. However, we should *not* become unduly preoccupied with the current account balance, because it ignores capital and financial account transactions. If foreigners purchase more U.S. assets in the United States (such as land, buildings, and bonds), then the United States can afford to import more goods and services from abroad. To look at one aspect of a nation's international payment position without considering the others is misleading.

Taken as a whole, U.S. international transactions always balance. This balance means that any force leading to an increase or decrease in one balance-of-payments account sets in motion a process leading to exactly offsetting changes in the balances of other accounts. As seen in Table 10.2, the United States had a current account deficit in 2016 of $-\$481.2$ billion. Offsetting this deficit was a combined surplus of \$481.2 billion in the remaining capital and financial accounts, including statistical discrepancy.

What Does a Current Account Deficit (Surplus) Mean?

Concerning the balance-of-payments, the current account and the capital and financial account are not unrelated; they are essentially reflections of one another. Because the balance-of-payments is a double entry accounting system, total debits will always equal total credits. It follows that if the current account registers a *deficit* (debits outweigh credits) the capital and financial account must register a *surplus* or net capital/financial *inflow* (credits outweigh debits). Conversely, if the current account registers a *surplus*, the capital and financial account must register a *deficit* or net capital/financial *outflow*.

To better understand this concept, assume that in a particular year your spending is greater than your income. How will you finance your “deficit”? The answer is by borrowing

or by selling some of your assets. You might liquidate some real assets (sell your personal computer) or perhaps some financial assets (sell a U.S. government security that you own). In like manner, when a nation experiences a current account deficit, its expenditures for foreign goods and services are greater than the income received from the international sales of its own goods and services, after making allowances for investment income flows and gifts to and from foreigners. The nation must somehow finance its current account deficit. How? The answer lies in selling assets and borrowing. In other words, a nation's current account deficit (debits outweigh credits) is offset by a net financial inflow (credits outweigh debits) in its capital and financial account.

One should not treat international capital flows as though they are passively responding to what is happening in the current account. The current account deficit, some say, is “financed” by U.S. borrowing abroad. However, international investors buy U.S. assets not for the purpose of financing the U.S. current account deficit but because they believe these are sound investments, promising a good combination of safety and return. Also, many of these investments have nothing whatsoever to do with borrowing as commonly understood, but instead involve purchases of land, businesses, and common stock in the United States. Therefore, much of this foreign capital does go to finance mortgages and consumer loans, which help the U.S. standard of living. And much is invested in land, plants and equipment, and financial assets, none of which needs to be repaid and all of which can make the U.S. economy and exports more globally competitive.

Net Foreign Investment and the Current Account Balance

The current account balance is synonymous with **net foreign investment** in national income accounting. A *current account surplus* means an excess of exports over imports of goods, services, investment income, and unilateral transfers. This surplus permits a net receipt of financial claims for home nation residents. These funds can be used by the home nation to build its financial assets or to reduce its liabilities to the rest of the world, improving its net foreign investment position (its net worth vis-à-vis the rest of the world). The home nation experiences capital outflows and thus becomes a net *supplier* of funds (lender) to the rest of the world. Conversely, a *current account deficit* implies an excess of imports over exports of goods, services, investment income, and unilateral transfers. This deficit leads to an increase in net foreign claims on the home nation. The home nation experiences foreign capital inflows and thus becomes a net *demand* of funds from abroad, the demand being met through borrowing from other nations or liquidating foreign assets. Thus, the economy is using world savings to meet its local investment and consumption demands. The result is a worsening of the home nation's net foreign investment position, which means the country is a net debtor to the rest of the world.

The current account balance thus represents the bottom line on a nation's income statement. If it is positive, then the nation is spending less than its total income and accumulating asset claims on the rest of the world. If it is negative, then domestic expenditure exceeds income and the nation borrows from the rest of the world.

The net borrowing of an economy can be expressed as the sum of the net borrowing by each of its sectors: government and the private sector including business and households. Net borrowing by government equals its budget deficit: the excess of outlays (G) over taxes (T). Private sector net borrowing equals the excess of private investment (I) over private saving (S). The net borrowing of the nation is given by the following identity:

$$\begin{array}{rcccl} \text{Current Account Deficit} & = & (G - T) & + & (I - S) \\ \text{(net borrowing)} & & \text{Government} & & \text{Private} \\ & & \text{Deficit} & & \text{Investment} \\ & & & & \text{Private} \\ & & & & \text{Saving} \end{array}$$

An important aspect of this identity is that the current account deficit is a macroeconomic phenomenon: It reflects imbalances between government outlays and taxes as well as imbalances between private investment and saving. Any effective policy to decrease the current account deficit must ultimately reduce these discrepancies. Reducing the current account deficit requires either decreases in the combined deficit of federal, state, and local governments or increases in private saving of U.S. households and businesses relative to business investment, or both. These options are difficult to achieve. Decreasing budget deficits may require unpopular tax hikes or government program cutbacks. Efforts to reduce investment spending would be opposed because investment is a key determinant of the nation's productivity and standard of living. Also, incentives to stimulate saving such as tax breaks may be opposed on the grounds that they favor the rich rather than the poor.

The size of the current account deficit is also determined by the level of economic activity in the rest of the world, especially in countries that are strong trading partners of the home country. It is also determined by the exchange value of the home country's currency against the currencies of its trading partners.

In sum, the home country realizes a current account deficit when it spends more than it earns—keeping in mind that domestic spending and earnings are affected by the pace of economic activity abroad and the foreign exchange value of the domestic currency. When economic activity abroad is strong, it is easier for domestic firms to sell goods and services to foreign buyers; but when the domestic currency is strong (expensive), domestic firms find it harder to sell abroad and easier to buy foreign goods and services.

Therefore, decreasing a current account deficit is not entirely in the hands of the home nation. For the world as a whole, the sum of all nations' current account balances must equal zero. A reduction in one nation's current account deficit must go hand in hand with a decrease in the current account surplus of the rest of the world. A complementary policy in foreign nations, especially those with large current account surpluses, can help in successful transition.

Impact of Capital Flows on the Current Account

In the preceding section we described a country's capital and financial flows as responsive to developments in the current account. The process can, and often does, work the other way around, with capital and financial flows initiating changes in the current account. If foreigners want to purchase U.S. financial instruments exceeding the amount of foreign financial obligations that Americans want to hold, they must pay for the excess with shipments of foreign goods and services. A financial inflow to the United States is associated with a U.S. current account deficit.

Let us elaborate on how a U.S. current account deficit can be caused by a net financial inflow to the United States. Suppose domestic saving falls short of desired domestic investment. U.S. interest rates rise relative to interest rates abroad that attract an inflow of foreign saving to help support U.S. investment. The United States becomes a net importer of foreign saving, using the borrowed purchasing power to acquire foreign goods and services, and resulting in a like sized net inflow of goods and services—a current account deficit. But how does a financial inflow cause a current account deficit for the United States? When foreigners start purchasing more of our assets than we are purchasing of theirs, the dollar becomes more costly in the foreign exchange market (see Chapter 11). This causes U.S. goods to become more expensive to foreigners, resulting in declining exports; foreign goods become cheaper to Americans, resulting in increasing imports. The result is a rise in the

current account deficit or a decline in the current account surplus as summarized in the following flowchart.

Relatively high interest rates in U.S.	→	Capital inflows for U.S.	→	Appreciation of dollar's exchange value	→	U.S.exports decrease/ imports increase	→	Current account deficit for U.S.
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Economists believe that in the 1980s, a massive financial inflow caused a current account deficit for the United States. The financial inflow was the result of an increase in the U.S. interest rate relative to interest rates abroad. The higher interest rate was mainly because of the combined effects of the U.S. federal government's growing budget deficit and a decline in the private saving rate.

Instead of thinking that capital flows are financing the current account deficit, it may well be that the current account deficit is driven by capital flows: Capital inflows keep the dollar stronger than it otherwise would be, tending to boost imports and suppress exports, thus leading to a current account deficit.

Is Trump's Trade Doctrine Misguided?

When Donald Trump entered into negotiations with the governments of Mexico and Canada to renegotiate the North American Free Trade Agreement (NAFTA) in 2017, he insisted that a revised NAFTA must reduce America's trade deficits with Canada and Mexico. This reflected his belief that U.S. trade deficits tend to be the result of unfair trade practices of other nations, resulting in job losses for American workers. Trade must be balanced to be fair and tariffs should be used to level the playing field, according to Trump.

However, many economists saw Trump's focus on a bilateral trade deficit with a particular country as being misplaced. This is because a bilateral trade deficit matters little for a country's aggregate (global) trade balance. For example, Germany, despite running bilateral trade deficits with Hungary and Slovakia, has run a large aggregate trade surplus in recent years. Therefore, it is the aggregate trade balance that matters—that is, the current account balance. Moreover, aggregate trade imbalances have little to do with trade policies like tariffs.

Aggregate trade imbalances are determined by underlying macroeconomic fundamentals. On the real side of the economy, the main relationship is between domestic spending (consumption, investment, and government spending) and domestic production: An excess of spending results in a trade deficit, as the difference is made up by net imports, while an excess of production results in a trade surplus as that excess is exported. On the financial side, the main relationship is between saving and investment within each country: A shortage of savings results in a net capital inflow that finances a trade deficit while insufficient investment (or excess savings) necessitates a net capital outflow that is the counterpart of a trade surplus.

Many economists contend that the most effective policy initiative that would reduce America's current account deficit on a continuing basis would be a reduction in the U.S. budget deficit, which would simultaneously reduce domestic spending and the demand for foreign capital to finance it—especially as the economy approaches full employment. By contrast, further increases in the budget deficit would increase the external deficit whatever NAFTA or other trade partners might do.

Moreover, even the full attainment of bilateral balance with a major trading partner, such as Mexico or Canada, would be highly unlikely to substantially decrease the aggregate trade deficit of the United States and thus yield any positive effect on its overall economy. This is because a country's aggregate trade balance is founded on the fundamentals of its own economy and their interaction with the rest of the world. Therefore, any decrease in America's trade deficit with Mexico, that was not underlain by a change in those fundamentals, would soon be replaced by a rise in its deficit with other countries. America's imports would simply move from Mexico to other countries as production of the relevant products shifts, or America's exports would move to Mexico from other countries with a negligible net impact on the overall balance.²

INTERNATIONAL FINANCE APPLICATION

The iPhone's Complex Supply Chain Depicts Limitations of Trade Statistics

Do high-technology products invented by American companies result in a trade surplus for the United States? Not necessarily. Consider the case of the iPhone.

Designed and marketed by Apple Inc. (a U.S. company), the iPhone functions as a camera phone, including visual voicemail, text messaging, a portable media player, and an Internet client, with e-mail, web browsing, and Wi-Fi connectivity. It obviously is a high-technology product. However, instead of contributing to a trade surplus for the United States, the iPhone results in a bilateral trade deficit with China. This is because China ships to the United States all iPhones purchased by American consumers.

In 2009, the iPhone increased the U.S. trade deficit with China by \$1.9 billion according to conventional trade statistics. How is this possible? Conventional ways of measuring trade flows do not acknowledge the intricacies of global commerce where the design, manufacturing, and assembly of goods often encompass several countries. The weakness of the conventional approach is that it considers the full value of an iPhone as a Chinese export to the United States, even though it is designed by a U.S. company and is manufactured largely from components produced in several Asian and European countries. China's only contribution to the value of an iPhone is the final step of assembling and shipping it to the United States.



As seen in Table 10.4, the entire \$179.02 wholesale cost of an iPhone that was shipped to the United States in 2009 was credited to China's exports, even though the value of work performed by Chinese assemblers amounted to \$6.50, or just 3.6 percent of the total. This resulted in an exaggeration of the bilateral trade deficit of the United States with China. If

China was credited with producing only its portion of the value of an iPhone, its exports to the United States for the same amount of iPhones would have been a much smaller figure. This is why many economists feel that breaking down imports and exports in terms of the value added from different countries is a more accurate way of measuring trade statistics than the conventional method.

Conventional trade statistics tend to inflate bilateral trade deficits between a country used as an export processing zone by multinational firms and its destination countries. In the case of the iPhone, China only accounted for 3.6 percent of the U.S. \$1.9 billion trade deficit, the remainder stemming from Japan, Germany, and other countries that produced components used to make the iPhone. By inflating the bilateral trade deficit with China, conventional trade statistics add to political tensions simmering in Washington, DC, over what to do about China's allegedly undervalued currency and unfair trading practices.

(continued)

²C. F. Bergsten and Monica de Bolle, editors, *A Path Forward for NAFTA*, Peterson Institute for International Economics, July 2017; Caroline Freund, *Public Comment on Trump Administration Report on Significant Trade Deficits*, Peterson Institute for International Economics, May 8, 2017; and Mary Amiti, Caroline Freund, and Tyler Bodine-Smith, *Why Renegotiating NAFTA Could Disrupt Supply Chains*, Liberty Street Economics, Federal Reserve Bank of New York, April 18, 2017.

What do you think? Given the limitations of balance-of-payments statistics, are they of much use to policy makers?

Sources: Yuqing Xing and Neal Detert, *How iPhone Widens the U.S. Trade Deficits with PRC*, National Graduate Institute for Policy Studies, Tokyo, Japan, November 2010; and Andrew Batson, "Not Really Made in China," *The Wall Street Journal*, December 15, 2010, pp. B1–B2.

Table 10.4

Global Production and Manufacturing Cost of the iPhone

Of the \$179.02 wholesale cost of an iPhone in 2009, components came from many countries to be assembled in China. Here's the breakdown:

Manufacturing Cost (Labor and Components)	In U.S. Dollars	Percentage of Total Manufacturing Cost
Japan	\$60.60	33.9%
Germany	30.15	16.8
South Korea	22.96	12.8
United States	10.75	6.0
China	6.50	3.6
Other	<u>48.06</u>	<u>26.9</u>
	<u>179.02</u>	<u>100.0</u>

Source: Yuqing Xing and Neal Detert, *How iPhone Widens the U.S. Trade Deficits with PRC*, National Graduate Institute for Policy Studies, Tokyo, Japan, November 2010.

Is a Current Account Deficit a Problem?

Contrary to commonly held views, a current account deficit has little to do with foreign trade practices or any inherent inability of a country to sell its goods on the world market. Instead, it occurs because of underlying macroeconomic conditions at home requiring more imports to meet current domestic demand for goods and services than can be paid for by export sales. In effect, the domestic economy spends more than it produces and this excess of demand is met by a net inflow of foreign goods and services leading to the current account deficit. This tendency is minimized during periods of recession but expands significantly with the rising income associated with economic recovery and expansion. Current account deficits are not efficiently reversed by trade policies that attempt to alter the levels of imports or exports such as tariffs, quotas, or subsidies.

When a nation realizes a current account deficit, it experiences foreign capital inflows and becomes a net borrower of funds from the rest of the world. Is this a problem? Not necessarily. Foreign capital inflows augment domestic sources of capital that, in turn, keep domestic interest rates lower than they would be without foreign capital. The benefit of a current account deficit is the ability to push current spending beyond current production. However, the cost is the debt service that must be paid on the associated borrowing from the rest of the world.

Is it good or bad for a country to incur debt? The answer obviously depends on what the country does with the money. What matters for future incomes and living standards is whether the deficit is being used to finance more consumption or more investment. If used exclusively to finance an increase in domestic investment, the burden could be slight. We know that investment spending increases the nation's stock of capital and expands the

economy's capacity to produce goods and services. The value of this extra output may be sufficient to both pay foreign creditors and augment domestic spending. In this case, because future consumption need not fall below what it otherwise would have been, there would be no true economic burden. If, on the other hand, foreign borrowing is used to finance or increase domestic consumption (private or public), there is no boost given to future productivity. To meet debt service expense, future consumption must be reduced below what it otherwise would have been. Such a reduction represents the burden of borrowing. This is not necessarily bad; it all depends on how one values current versus future consumption.

During the 1980s when the United States realized current account deficits, the rate of domestic saving decreased relative to the rate of investment. In fact, the decline of the overall saving rate was mainly the result of a decrease of its public saving component, caused by large and persistent federal budget deficits in this period—budget deficits are in effect negative savings that subtract from the pool of savings. This negative savings indicated that the United States used foreign borrowing to increase current consumption, not productivity enhancing public investment. The U.S. current account deficits of the 1980s were greeted with concern by many economists.

In the 1990s, U.S. current account deficits were driven by increases in domestic investment. This investment boom contributed to expanding employment and output. It could not have been financed by national saving alone. Foreign lending provided the additional capital needed to finance the boom. In the absence of foreign lending, U.S. interest rates would have been higher and investment would inevitably have been constrained by the supply of domestic saving. The accumulation of capital and the growth of output and employment would all have been smaller had the United States not been able to run a current account deficit in the 1990s. Rather than choking off growth and employment, the large current account deficit allowed faster long run growth in the U.S. economy that improved economic welfare.

Business Cycles, Economic Growth, and the Current Account

How is the current account related to a country's business cycle and long run economic growth? Concerning the business cycle, *rapid* growth of production and employment is commonly associated with large or growing trade and current account *deficits*. These deficits are often the byproduct of a healthy economy. They mean that the purchasing power of the domestic currency is strong, and consumers are wealthy and optimistic enough to spend, thus increasing imports. The opposite is also true: Countries in recession, and facing *slow* output and employment growth, tend to be associated with large or growing current account *surpluses*; that is, their unemployed are forced to tighten their belts and reduce spending, and even those working cannot afford imports.

During a recession, both saving and investment tend to fall. Saving falls as households try to maintain their consumption patterns in the face of a temporary fall in income; investment declines because capacity utilization declines and profits fall. Because investment is highly sensitive to the need for extra capacity, it tends to drop more sharply than saving during recessions. The current account balance tends to rise. Consistent with this rise but viewed from a different angle, the trade balance typically improves during a recession because imports tend to fall with overall consumption and investment demand. The opposite occurs during periods of boom when sharp increases in investment demand typically outweigh increases in saving, producing a decline in the current account. Of course, factors other than income influence saving and investment so that the tendency of a country's current account deficit to decline in recessions is not ironclad.

The relation just described between the current account and economic performance typically holds not only on a short-term or cyclical basis, but also on a long-term basis. Often, countries enjoying *rapid* economic growth possess long run current account *deficits*, whereas those with *weaker* economic growth have long run current account *surpluses*. This relation likely derives from the fact that rapid economic growth and strong investment often go hand in hand. Where the driving force is the discovery of new natural resources, technological progress, or the implementation of economic reform, periods of rapid economic growth are likely to be periods when new investment is unusually profitable. Investment must be financed with saving, and if a country's national saving is not sufficient to finance all new profitable investment projects, the country will rely on foreign saving to finance the difference. It thus experiences a net financial inflow and a corresponding current account deficit. As long as the new investments are profitable, they will generate the extra earnings needed to repay the claims contracted to undertake them. When current account deficits reflect strong, profitable investment programs, they work to raise the rate of output and employment growth, not to destroy jobs and production.

How the United States Has Borrowed at Very Low Cost

Over the past four decades, the U.S. current account has moved from a small surplus to a large deficit. This deficit is financed by either borrowing from or selling assets to foreigners. As the current account deficit has increased for the United States, the country has become a large net debtor. When a country increases its borrowing from abroad, the cost of servicing its debt is expected to increase. This is because the country must make larger payments of interest and principal to foreign lenders.

During the past two decades, there has been a paradox in U.S. international transactions: U.S. residents have consistently earned more income from their foreign investments than foreigners earn from their larger U.S. investments. The United States has been able to be a large debtor nation without bearing negative debt service cost. This paradox suggests that the U.S. current account deficits might be less burdensome than often portrayed.

What accounts for this paradox? One explanation concerns asymmetric investment returns. The United States has tended to consistently earn higher returns on its foreign investments than foreigners earn on U.S. investments. This overall rate of return advantage has generally been one to two percentage points. A main reason for this advantage is that U.S. companies take greater risks when they invest in foreign nations, such as economic and political instability. Investments that involve higher risk will not be undertaken unless they offer the potential for higher rewards. Conversely, because the United States is generally considered a safe haven for investment, foreign investors are more likely to buy U.S. assets that offer low return and low risk.

This paradox provides an explanation of why the massive foreign borrowing by the United States has been relatively painless in the past two decades. Future borrowing prospects may not be as favorable. Skeptics fear that if global interest rates rise, the United States will have to pay higher rates to attract foreign investment, thus increasing U.S. interest payments to foreigners. These payments could swing the U.S. investment income balance from surplus to deficit and cause U.S. debt service costs to become burdensome. As these costs grow, the U.S. current account deficit and its consequences could increasingly become matters of concern for economic policymakers.³

³Juann Hung and Angelo Mascaro, *Why Does U.S. Investment Abroad Earn Higher Returns Than Foreign Investment in the United States?*, Washington, DC, Congressional Budget Office, 2005; Craig Elwell, *U.S. External Debt: How Has the United States Borrowed without Cost?*, Washington, DC, Congressional Research Service, 2006; and William Cline, *The United States as a Debtor Nation*, Washington, DC, Institute for International Economics, 2005.

Do Current Account Deficits Cost Americans Jobs?

When reading newspapers, one may get the impression that increasing trade (current account) deficits drag down the U.S. economy or at least stall economic growth. Why? Rising imports can decrease domestic employment and overall growth by subtracting from demand for domestically produced goods and services. Every cell phone, radio, or shirt that we import represents one fewer cell phone, radio, or shirt that could have been produced in the United States, resulting in the layoff of American workers who were previously employed producing those items.

For example, because recent U.S. trade deficits have been concentrated in manufactured goods, a larger trade deficit translates into less manufacturing jobs for Americans. In 1970, about 26.4 percent of total American non-farm employment was conducted in manufacturing. In 2016, the figure had declined to about 8.5 percent. Although automation explains most of the decrease, economists estimate that if the United States had no trade deficit in 2016, manufacturing employees might have accounted for about 10 percent of the labor force. Those who consider manufacturing as superior to other sectors of the economy, such as services, tend to criticize the U.S. trade deficit.

Although export and import trends raise concerns about U.S. job losses, economists at the Federal Reserve Bank of New York and the Cato Institute have found that employment statistics do not bear out the relation between a rising current account deficit and lower employment.⁴ Why? A current account deficit may hurt employment in particular firms and industries as workers are displaced by increased imports. At the economy-wide level, however, the current account deficit is matched by an equal inflow of foreign funds that finances employment sustaining investment spending that would not otherwise occur. A region of the United States that would benefit from the foreign purchase of American-grown corn would presumably benefit as much, if not more, were the Japanese to invest in an auto plant in the United States. Foreign purchases of U.S. Treasury securities decrease long-term interest rates, helping to stimulate the U.S. economy. Foreign purchases of U.S. stock and real estate place dollars in the hands of those Americans who are selling the assets, which in turn entices them to spend more freely on domestically produced goods. Whether dollars flow into the United States to purchase our goods or to purchase our assets, economic activity is promoted. The foreign purchase of American assets can stimulate the U.S. economy just as well as the export of goods and services.

When viewed as the net inflow of foreign investment, the current account deficit produces jobs for the economy—both from the direct effects of higher employment in investment-oriented industries and from the indirect effects of higher investment spending on economy-wide employment. Viewing the current account deficit as a net inflow of foreign investment helps to dispel misconceptions about the adverse consequences of economic globalization on the domestic job market.

Although this analysis indicates that current account deficits do not cause a net loss of output or jobs in the overall economy, they tend to change the composition of output and employment. Evidence suggests that over the past three decades, persistent current account deficits have likely caused a reduction in the size of the U.S. manufacturing sector while output and employment in the economy's service sector have increased.

⁴Matthew Higgins and Thomas Klitgaard “Viewing the Current Account Deficit as a Capital Inflow,” *Current Issues and Economics and Finance*, Federal Reserve Bank of New York, December 1999; and Daniel Griswold, *The Trade-Balance Creed: Debunking the Belief That Imports and Trade Deficits Are a Drag on Growth*, Washington, DC, The Cato Institute April 11, 2011.

Can the United States Continue to Run Current Account Deficits Indefinitely?

The United States has benefitted from a surplus of saving over investment in many areas of the world that has provided a supply of funds. This surplus of saving has been available to the United States because foreigners have remained willing to loan that saving to the United States in the form of acquiring U.S. assets such as Treasury securities that have accommodated the current account deficits. During the 1990s and the first decade of the 2000s, the United States experienced a decline in its rate of savings and an increase in the rate of domestic investment. The large increase in the U.S. current account deficit would not have been possible without the accommodating inflows of foreign capital coming from nations with high savings rates such as Japan and China.

China is a major supplier of capital to the United States. This is partly because of China's exchange rate policy of keeping the value of its *yuan* low (cheap) so as to export goods to the United States and thus create jobs for its workers (see Chapter 15). In order to offset a rise in the value of the yuan against the dollar, the central bank of China has purchased dollars with yuan. Rather than hold dollars that earn no interest, China's central bank has converted much of its dollar holdings into U.S. securities that pay interest. This situation has put the United States in a unique position to benefit from the willingness of China to finance its current account deficit. The United States can "print money" that the Chinese hold in order to finance its excess spending. The buildup of China's dollar reserves helps support the U.S. stock and bond markets and permits the U.S. government to incur expenditure increases and tax reductions without increases in domestic U.S. interest rates that would otherwise take place. Some analysts are concerned that at some point Chinese investors may view the increasing level of U.S. foreign debt as unsustainable or more risky and suddenly shift their capital elsewhere. They also express concern that the United States will become more politically reliant on China who might use its large holdings of U.S. securities as leverage against policies it opposes.

Can the United States run current account deficits indefinitely and rely on inflows of foreign capital? Because the current account deficit arises mainly because foreigners desire to purchase American assets, there is no economic reason why it cannot continue indefinitely. As long as the investment opportunities are large enough to provide foreign investors with competitive rates of return, they will be happy to continue supplying funds to the United States. There is no reason why the process cannot continue indefinitely: No automatic forces will cause either a current account deficit or a current account surplus to reverse.

U.S. history illustrates this point. From 1820 to 1875, the United States ran current account deficits almost continuously. At that time, the United States was a relatively poor (by European standards) but rapidly growing country. Foreign investment helped foster that growth. This situation changed after World War I. The United States was richer and investment opportunities were more limited. Current account surpluses were present almost continuously between 1920 and 1970. During the last 40 years, the situation has again reversed. The current account deficits of the United States are underlain by its system of secure property rights, a stable political and monetary environment, and a rapidly growing labor force (compared with Japan and Europe), which make the United States an attractive place to invest. Moreover, the U.S. saving rate is low compared to its major trading partners. The U.S. current account deficit reflects this combination of factors, and it is likely to continue as long as they are present. Simply put, the U.S. current account deficit has reflected a surplus of good investment opportunities in the United States and a deficit of growth prospects elsewhere in the world.

Some economists think that because of spreading globalization, the pool of savings offered to the United States by world financial markets is deeper and more liquid than ever. This pool allows foreign investors to continue furnishing the United States with the money it needs without demanding higher interest rates in return. Presumably, a current account deficit of 6 percent or more of GDP would not have been readily fundable several decades ago. The ability to move so much of world saving to the United States in response to relative rates of return would have been hindered by a far lower degree of international financial interdependence. In recent years, the increasing integration of financial markets has created an expanding class of foreigners who are willing and able to invest in the United States.

The consequence of a current account deficit is a growing foreign ownership of the capital stock of the United States and a rising fraction of U.S. income that must be diverted overseas in the form of interest and dividends to foreigners. A serious problem could emerge if foreigners lose confidence in the ability of the United States to generate the resources necessary to repay the funds borrowed from abroad. As a result, suppose that foreigners decide to reduce the fraction of their saving that they send to the United States. The initial effect could be both a sudden and large decline in the value of the dollar as the supply of dollars increases on the foreign exchange market and a sudden and large increase in U.S. interest rates as an important source of saving was withdrawn from financial markets. Large increases in interest rates could cause problems for the U.S. economy as they reduce the market value of debt securities, causing prices on the stock market to decline, and raising questions about the solvency of various debtors. Whether the United States can sustain its current account deficit over the foreseeable future depends on whether foreigners are willing to increase their investments in U.S. assets. The current account deficit puts the economic fortunes of the United States partially in the hands of foreign investors.

The economy's ability to cope with big current account deficits depends on continued improvements in efficiency and technology. If the economy becomes more productive, then its real wealth may grow fast enough to cover its debt. Optimists note that robust increases in U.S. productivity in recent years have made its current account deficits affordable. If productivity growth stalls, the economy's ability to cope with current account deficits will deteriorate.

Although the appropriate level of the U.S. current account deficit is difficult to assess, at least two principles are relevant should it prove necessary to reduce the deficit. First, the United States has an interest in policies that stimulate foreign growth, because it is better to reduce the current account deficit through faster growth abroad than through slower growth at home. A recession at home would obviously be a highly undesirable means of reducing the deficit. Second, any reductions in the deficit are better achieved through increased national saving than through reduced domestic investment. If there are attractive investment opportunities in the United States, we are better off borrowing from abroad to finance these opportunities than forgoing them. On the other hand, incomes in this country would be even higher in the future if these investments were financed through higher national saving. Increases in national saving allow interest rates to remain lower than they would otherwise be. Lower interest rates lead to higher domestic investment that in turn boosts demand for equipment and construction. For any given level of investment, increased saving also results in higher net exports that would again increase employment in these sectors.

Shrinking the U.S. current account deficit can be difficult. The economies of foreign nations may not be strong enough to absorb additional American exports, and Americans may be reluctant to curb their appetite for foreign goods. The U.S. government has shown a bias toward deficit spending. Turning around a deficit is associated with a sizable fall in the exchange rate and a decrease in output in the adjusting country, topics that will be discussed in subsequent chapters.

Balance of International Indebtedness

A main feature of the U.S. balance-of-payments is that it measures the economic transactions of the United States over a period of one year or one quarter, but at any particular moment, a nation will have a fixed stock of assets and liabilities against the rest of the world. The statement that summarizes this situation is known as the **balance of international indebtedness**. It is a record of the international position of the United States at a particular time (year-end data).

The U.S. balance of international indebtedness indicates the accumulated value of U.S.-owned assets abroad as opposed to foreign-owned assets in the United States. These assets include such financial assets as corporate stocks and bonds, government securities, and direct investment in businesses and real estate. The value of these assets can change as a result of purchases and sales of new or existing assets, changes in the value of assets that arise through appreciation/depreciation or inflation, and so on. The United States is considered a **net creditor** to the rest of the world when the accumulated value of U.S.-owned assets abroad exceeds the value of foreign-owned assets in the United States. When the reverse occurs, the United States assumes a **net debtor** position. Table 10.5 shows the international investment position of the United States for various years.

TABLE 10.5

International Investment Position of the United States at Year End (Billions of Dollars)

Type of Investment*	1995	2000	2016
U.S.-owned assets abroad (U.S. assets)	3,406	6,168	23,917
Foreign-owned assets in the United States (U.S. liabilities)	3,906	8,010	32,027
Net international investment position	-500	-1,842	-8,110
Relative share: U.S. net international investment position/U.S. gross domestic product	6%	15%	44%

*At current cost.

Source: From U.S. Department of Commerce, Bureau of Economic Analysis, *The International Investment Position of the United States at Year End*, available at <http://www.bea.gov>. See also U.S. Department of Commerce, *Survey of Current Business*, various June and July issues.

Of what use is the balance of international indebtedness? Perhaps the greatest significance is that it breaks down international investment holdings into several categories so that policy implications can be drawn from each separate category about the *liquidity status* of the nation. For the short-term investment position, the strategic factor is the amount of short-term liabilities (bank deposits and government securities) held by foreigners. This is because these holdings potentially can be withdrawn at short notice, resulting in a disruption of domestic financial markets. The balance of official monetary holdings is also significant. Assume that this balance is negative from the U.S. viewpoint. Should foreign monetary authorities decide to liquidate their holdings of U.S. government securities and have them converted into official reserve assets, the financial strength of the dollar would be reduced. As for a nation's long-term investment position, it is of less importance for the U.S. liquidity position because long-term investments generally respond to basic economic trends and are not subject to erratic withdrawals.

United States as a Debtor Nation

In the early stages of its industrial development, the United States was a net international debtor. Relying heavily on foreign funds, the United States built up its industries by mortgaging part of its wealth to foreigners. After World War I, the United States became a net international creditor. By 1987 the United States had become a net international debtor, and it has continued to maintain that position.

Why did this turnabout occur so rapidly? The reason was that foreign investors placed more funds in the United States than U.S. residents invested abroad. The United States was considered attractive to investors from other countries because of its rapid economic recovery from the recession of the early 1980s, its political stability, and its relatively high interest rates. American investments overseas fell because of the sluggish loan demand in Europe, the desire by commercial banks to reduce their overseas exposure as a reaction to the debt repayment problems of Latin American countries, and the decreases in credit demand by oil-importing developing nations as the result of declining oil prices. Of the foreign investment funds in the United States, less than one-fourth went to direct ownership of U.S. real estate and business. Most of the funds were in financial assets such as bank deposits, stocks, and bonds.

For the typical U.S. resident, the transition from net creditor to net debtor went unnoticed. However, the net debtor status of the United States raised an issue of propriety. To many observers, it seemed inappropriate for the United States, one of the richest nations in the world, to be borrowing on a massive scale from the rest of the world.

INTERNATIONAL FINANCE APPLICATION

Global Imbalances

If you considered the world economy as a whole in 2018, you would see that it was out of balance. Advanced countries such as the United States have often consumed more, saved less, relied on fiscal deficits, and attained large current account deficits. The trading partners of the United States, some of whom are poor, have loaned the United States, a prosperous country, the funds necessary to finance the imbalance. Conversely, emerging world countries such as China have tended to consume less, save more, have undervalued currencies, and realize large current account surpluses. Capital has flowed from fast-growing emerging countries, where returns on investment are presumably high, to mature wealthy countries. Is this situation sustainable or desirable? Should the rest of the world rely on U.S. consumers as a source of demand for their exports?

Although it is difficult to predict how these trends will play out, most economists maintain that rebalancing the world economy is desirable. They note that advanced



countries should consume less, save more, become more fiscally disciplined, and decrease current account deficits.

Emerging countries should allow the exchange values of their currencies to rise (appreciate), consume more, save less, decrease current account surpluses, and continue investing, with some of the capital provided by outsiders.

If major governments of the world work together to rebalance and coordinate their fiscal, monetary, trade, and foreign exchange policies, the adjustment process can be gradual and not disruptive to the global economy.

Such a policy adjustment is not easy to accomplish. Politicians in advanced countries must respond to the preferences of voters who often don't understand how the world economy operates and who desire policies that entail fiscal deficits. They often want governments to spend more money on social programs—in the United States, for example, on Medicare and Social Security—without raising taxes to finance the extra spending. The usual response by advanced country governments to such

(continued)

demands is to run larger deficits and borrow more money. Yet many advanced country governments have been rapidly depleting their borrowing capacity, and some nations, such as Greece, Portugal, Ireland, and Spain, have experienced fiscal crises. In the future, major countries might lack the ability or willingness to rescue highly indebted governments. Debt restructuring and defaults would become inevitable at that point.

Emerging nations have different concerns. Usually they have low debt-to-GDP ratios, maintain large currency reserves, continue to attain current account surpluses, and provide more capital to advanced countries than they receive. Their economies are founded upon undervalued currencies, low-cost labor, high savings rates, exports, and investment in infrastructure. These countries are apprehensive about growing too rapidly or allowing too great a volume of capital inflows that can promote asset bubbles. They are also skeptical of anything that would limit their growth, given the rising expectations of their populations.

Both sides, of course, need to modify their behavior. If they do not, the capital markets may discipline governments if the imbalances, particularly the fiscal deficits of advanced countries, continue to grow.

However, not all advanced economies run current-account deficits. Consider the case of Germany, which

has run current-account surpluses for decades. The fundamental reason for this surplus is that Germany saves too much and spends too little. Underlying the surplus is a decades-old agreement between business and unions in favor of wage restraint to support the competitiveness of German export industries. However, wage restraint leads to less domestic spending and fewer imports, thus fostering current-account surpluses. And Germany is not by itself as Denmark, Sweden, and the Netherlands have accumulated large surpluses as well. Moreover, a large economy such as Germany that runs sizable current-account surpluses imposes a strain on the world trading system. To offset such surpluses and maintain enough spending to keep people at work, the rest of the world must borrow and spend with equal abandon. In some countries, such as Spain, Italy, and Greece, continuing deficits have eventually resulted in economic crisis. Simply put, the German surplus has resulted in problems for the world economy.

Sources: “The German Problem,” *The Economist*, July 8, 2017; Jane Sneddon Little, editor, *Global Imbalances and the Evolving World Economy*, Federal Reserve Bank of Boston, Boston, Massachusetts, 2008; Lowell Bryan, “Globalization’s Critical Imbalances,” *McKinsey Quarterly*, McKinsey & Co., Boston, Massachusetts, June 2010; and John Williamson, *Getting Surplus Countries to Adjust*, Policy Brief, Peterson Institute for International Economics, January 2011.

The Dollar as the World’s Reserve Currency

Before we end our discussion of the balance-of-payments, let us consider the U.S. dollar as an international currency.

The dollar is the main reserve currency in the world today. Dollars are used throughout the world as a medium of exchange, unit of account, and store of value, and many nations keep wealth in dollar-denominated assets such as U.S. Treasury securities. Almost two-thirds of the world’s official foreign exchange reserves are held in dollars, while more than four-fifths of daily foreign exchange trades involve dollars. The euro, the second most important reserve currency, lags far behind the dollar, followed by the British pound and Japanese yen. The dollar’s popularity is supported by a strong and sophisticated U.S. economy and its safe haven attractiveness for international investors. The widening trade deficits and expanding foreign debt that the United States has incurred in recent decades have weakened the prestige of the dollar.

As more people have used dollars in international transactions in the post–World War II era, the efficiencies in using dollars in exchange increased, solidifying the dollar’s place as the world’s premier currency. Some have compared the dollar’s popularity to that of the Microsoft Windows operating system. Computer users may feel that substitute software is easier to use, but the convenience of being able to transfer files around the world to anyone using Microsoft enhances the system’s popularity. In the dollar’s case, widespread use of the dollar makes dealing in the currency easier and less expensive than

any other: The more countries that transact in dollars, the cheaper it is for them all to transact in dollars. Any one country would hesitate to stop dealing in dollars, even if it desired to use a different currency, unless it knew that other countries would do the same. This reluctance may be a key reason why the dollar is so difficult to displace as the world's main reserve currency.

Benefits to the United States

The United States realizes substantial benefits from the dollar serving as the main reserve currency of the world. First, Americans can purchase products at a marginally cheaper rate than other nations that must exchange their currency with each purchase and pay a transaction cost. Also, Americans can borrow at lower interest rates for homes and automobiles, and the U.S. government can finance larger deficits longer and at lower interest rates. The United States can issue debt (securities) in its own currency, thus pushing exchange rate risk onto foreign lenders. This risk means that foreigners face the possibility that a fall in the dollar's exchange value could wipe out the returns on their investments in the United States.

Despite the appeal of the dollar, there is increasing concern about its continuing role as the world's main reserve currency. Countries such as China fear that the United States is digging a hole with an economy based on huge deficits and massive borrowing that cloud the dollar's future. They worry about the volatility of the dollar and the destabilizing effect it can have on international trade and finance. Critics claim that a credit-based reserve currency such as the dollar is inherently risky, facilitates global imbalances, and promotes the spread of financial crises. As a result, they argue that the dollar should no longer serve as the world's reserve currency.

Before the dollar is displaced as a reserve currency, there must be a new contender for the throne. It is not the British pound whose best days are in the past nor the Chinese yuan whose reserve currency status is years in the future, if it ever occurs. As for the euro, the improved liquidity and breadth of Europe's financial markets have eroded some of the advantages that historically supported the preeminence of the dollar as a reserve currency. The recent financial problems plaguing Europe have weakened the status of the euro. Although Japan and Switzerland have strong institutions and financial markets, they have actively pushed down the value of their currencies in recent years, making them unappealing as stores of value. Thus, the dollar has kept its place as the dominant reserve currency, supported by the edge that U.S. financial markets still have over other markets in terms of size, credit quality, and liquidity, as well as inertia in the use of international currencies. The dollar has been regarded as a safe and secure place to park money despite the recent economic and political problems that have plagued the United States.

Will the Special Drawing Right or the Yuan Become a Reserve Currency?

In 2009, officials at the central bank of China proposed an overhaul of the international monetary system in which the SDR would eventually replace the dollar as the world's main reserve currency. Their goal was to adopt a reserve currency that is disconnected from a single country (the United States) and would remain stable in the long run, lessening the financial risks caused by the volatility of the dollar. To accomplish this objective, the Chinese advocated a new world reserve currency based on a basket of currencies instead of just the dollar. This currency basket would be fulfilled by the SDR, whose value is currently based on the euro, yen, pound, and dollar in accordance with the relative importance of each currency in international trade and finance. China proposed that the size of the

currency basket be expanded to include all major currencies such as the Chinese yuan and the Russian ruble. The SDR would be managed by the International Monetary Fund.

Several steps would have to be taken to broaden the SDR's use so it could fulfill IMF member countries' demands for a reserve currency. A settlement system between the SDR and other currencies would have to be established so the SDR would be widely accepted in world trade and financial transactions. Currently, the SDR is only used as a unit of account by the IMF and other international organizations. Also, the SDR would have to be actively promoted for use in trade, commodities pricing, investment, and corporate bookkeeping. Moreover, financial assets (securities) that are denominated in SDRs would have to be created to increase the attractiveness of the SDR. Achieving these results would require a significant amount of time.

Proponents maintain that allowing the SDR to serve as the world's reserve currency would provide several benefits. For the Chinese, it would cushion any depreciation in the dollar's exchange value because the dollar would only be a portion of a basket of several currencies. This would help stabilize the value of China's holdings of U.S. Treasury securities. Also, a basket reserve currency would help support aggregate demand in the world by decreasing the fear of currency volatility. Such fear served as a motivation for countries like China to save large amounts of reserves to guard against losses because of international currency volatility. Moreover, the economic welfare of the world should not depend on the behavior of a single currency, namely the dollar. Currency risk would be diversified through a basket reserve unit, thus enhancing stability and confidence throughout the world. Also, there is the issue of equity. Because the dollar is the main reserve currency where investors flee to safety during economic strife, the United States can attract the savings of other countries even when the interest rates it pays are low.

There are potential pitfalls of using the SDR as a reserve currency. One problem is that the SDR is backed by nothing other than the good faith and credit of the IMF; that is, the IMF produces nothing to support the value of the SDR. In contrast, the dollar is backed by the goods and services produced by Americans and their willingness to exchange those goods and services for dollars. Who would determine the "right price" of the SDR; the IMF? Would the IMF succumb to political pressure to change the SDR's currency weightings in favor of particular nations? The use of the SDR would add another step to each international transaction, as buyers and sellers would have to convert their local currency into SDRs. This conversion would increase the cost of doing business for companies, investors, and so on.

For the United States, a loss in its reserve currency position would entail several costs. First, Americans would have to pay more for imported goods as the dollar depreciates when foreigners no longer buy dollars as they previously did when the dollar served as the reserve currency. Interest rates on both private and governmental debt would increase. The increased private cost of borrowing could result in weaker consumption, decreased investment, and slower growth. The economic supremacy of the United States would be lessened if the dollar lost its reserve currency position. The United States has expressed strong reservations concerning the proposal to replace the dollar with the SDR as the reserve currency.

Adopting the SDR as a reserve currency might be technically possible, and it could occur if the United States followed persistently bad economic policy in the form of deficit spending, high inflation, and currency depreciation. If foreigners expect that the costs of holding dollars (in terms of lost purchasing power) exceed the benefits of transacting in dollars, they might opt for an alternative reserve currency. Replacing the dollar with the SDR as the reserve currency will likely not occur soon because people still realize sizable efficiencies from conducting international transactions in dollars. Until the SDR matches these benefits, it will not replace the dollar as the world's premier currency.

Another possibility is China's yuan as a reserve currency. China would need at least two things to issue a major reserve currency: a large economy and a deep, sophisticated, and open financial market. China has the first but not the second. Although China has recently been liberalizing its financial system to foreigners, it is not clear that China wants to become a dominant reserve currency nation: The more yuan foreigners would hold, the less control China would have over its exchange rate and its financial system.

In December 2015, the status of the yuan was enhanced by the IMF's announcement that the yuan would be added to the IMF's elite basket of reserve currencies. This decision became effective in 2016. Although this decision was a boost to China's self-esteem, analysts did not anticipate that it would drive a huge increase in yuan purchases. Nor is there much threat that the yuan will soon displace the dollar as the world's key reserve currency, especially given China's political and economic challenges.

Will Cryptocurrencies Lower the Dollar's Status as a World Reserve Currency?

Critics of our international monetary system have questioned the role of central bank-managed currencies such as the U.S. dollar, the British pound, and the euro. These currencies are "fiat money"—government-declared money that is not tied to an anchor such as gold. For example, critics note that by creating too much money, the Federal Reserve has contributed to inflation and a decline in the dollar's value. Is there a different type of money that better maintains its purchasing power? Proponents of the gold standard contend that it promotes sound money, although it is politically difficult to return to this monetary standard. Also, proponents of digital cryptocurrencies feel that they fulfill the principle of sound money. Currently, the most widely used cryptocurrency is Bitcoin, although competitors such as Ripple, Litecoin, and Ethereum also are used in the global payments system.

For example, Bitcoin is an online currency that relies on a decentralized digital payments system. Bitcoin was created in 2009. There are no physical Bitcoins, only digital balances kept on a public ledger. Bitcoins can be used to buy merchandise anonymously. Also, international payments are easy and cheap because Bitcoins are not tied to any country or subject to regulation. Unlike government-issued money that can be inflated at will, the supply of Bitcoin is mathematically limited to 21 million units of Bitcoin, and that can never be changed. Libertarians thus applaud the independence of Bitcoin from government influence. Simply put, the near zero transaction costs associated with Bitcoin, and its limited supply, has helped make Bitcoin attractive to investors seeking an alternative to both fiat money and gold.

In 2017, the head of the IMF, Christine Lagarde cautioned that cryptocurrencies could displace central banks, conventional banking, and national currencies in the years ahead. Why? They tend to decentralize the operation of the financial system outside control of national governments.

For example, criminal organizations use cryptocurrencies to launder money or otherwise pay for illicit activities, according to the U.S. government. To hide criminal proceeds, child exploiters, drug smugglers, illegal firearm sellers, and intellectual property rights violators use cryptocurrencies for their transactions. Also, Russia has enthusiastically promoted a national cryptocurrency as a way to avoid Western sanctions and economic influence. Moreover, the use of cryptocurrency provides North Korea opportunities to circumvent Western sanctions, because it reduces reliance on the U.S. dollar and removes intermediaries like banks, which have an obligation to report transactions with North Korea. Finally, people in developing countries, like Kenya, have embraced

cryptocurrencies. These currencies are viewed as a haven from political and economic turmoil, including the lack of conventional banking services or limited access to foreign currencies.

Simply put, a greater use of cryptocurrency would tend to decentralize the global financial system. But will this really occur? Cryptocurrencies like Bitcoin are not yet widely accepted in many countries, and in some countries its use is illegal. Therefore, it is hard for companies to conduct business entirely in cryptocurrencies. Although businesses might accept international payments in cryptocurrencies from their customers, there is no certainty that customers will be able or willing to use cryptocurrencies. Also, using cryptocurrency as a store of value is very risky. For example, in 2017 the price of Bitcoin jumped from \$969 to more than \$5,000 only to have it quickly fall. That exposes Bitcoin dealers to the risk of big quick profits, but also big, quick losses. At the writing of this text, the future of cryptocurrency remained an open question.

SUMMARY

1. The balance-of-payments is a record of a nation's economic transactions with all other nations for a given year. A credit transaction is one that results in a receipt of payments from foreigners, whereas a debit transaction leads to a payment abroad. Owing to double entry bookkeeping, a nation's balance-of-payments will always balance.
2. From a functional viewpoint, the balance-of-payments identifies economic transactions as (a) current account transactions and (b) capital and financial account transactions.
3. The balance on goods and services is important to policy makers because it indicates the net transfer of real resources overseas. It also measures the extent to which a nation's exports and imports are part of its gross national product.
4. The capital and financial account of the balance-of-payments shows the international movement of loans, investments, and the like. Capital and financial inflows (outflows) are analogous to exports (imports) of goods and services because they result in the receipt (payment) of funds from (to) other nations.
5. Official reserves consist of a nation's financial assets: (a) monetary gold holdings, (b) convertible currencies, (c) special drawing rights, and (d) drawing positions on the International Monetary Fund.
6. The current method employed by the Department of Commerce in presenting the U.S. international payments position makes use of a functional format emphasizing the following *partial* balances: (a) merchandise trade balance, (b) balance on goods and services, and (c) current account balance.
7. Because the balance-of-payments is a double entry accounting system, total debits will always equal total credits. It follows that if the current account registers a deficit (surplus), the capital and financial account must register a surplus (deficit), or net capital/financial inflow (outflow). If a country realizes a deficit (surplus) in its current account, it becomes a net demander (supplier) of funds from (to) the rest of the world.
8. Concerning the business cycle, rapid growth of production and employment is commonly associated with large or growing trade and current account deficits, whereas slow output and employment growth is associated with large or growing current account surpluses.
9. The international investment position of the United States at a particular time is measured by the balance of international indebtedness. Unlike the balance-of-payments, which is a flow concept (over a period of time), the balance of international indebtedness is a stock concept (at a single point in time).

KEY CONCEPTS AND TERMS

Balance of international indebtedness (p. 365)	Double entry accounting (p. 346)	Net foreign investment (p. 355)
Balance-of-payments (p. 345)	Goods and services balance (p. 347)	Official reserve assets (p. 351)
Capital and financial account (p. 349)	Income balance (p. 348)	Official settlements transactions (p. 350)
Credit transaction (p. 345)	Merchandise trade balance (p. 347)	Special drawing rights (p. 351)
Current account (p. 347)	Net creditor (p. 365)	Statistical discrepancy (p. 352)
Debit transaction (p. 345)	Net debtor (p. 365)	Trade balance (p. 353)
		Unilateral transfers (p. 348)

STUDY QUESTIONS

- What is meant by the balance-of-payments?
- What economic transactions give rise to the receipt of dollars from foreigners? What transactions give rise to payments to foreigners?
- Why does the balance-of-payments statement “balance”?
- From a functional viewpoint, a nation’s balance-of-payments can be grouped into several categories. What are these categories?
- What financial assets are categorized as official reserve assets for the United States?
- What is the meaning of a surplus (deficit) on the (a) merchandise trade balance, (b) goods and services balance, and (c) current account balance?
- Why has the goods and services balance sometimes shown a surplus while the merchandise trade balance shows a deficit?
- What does the balance of international indebtedness measure? How does this statement differ from the balance-of-payments?
- Indicate whether each of the following items represents a debit or a credit on the U.S. balance-of-payments:
 - A U.S. importer purchases a shipload of French wine.
 - A Japanese automobile firm builds an assembly plant in Kentucky.
 - A British manufacturer exports machinery to Taiwan on a U.S. vessel.
 - A U.S. college student spends a year studying in Switzerland.
 - American charities donate food to people in drought-plagued Africa.
- Japanese investors collect interest income on their holdings of U.S. government securities.
- A German resident sends money to her relatives in the United States.
- Lloyds of London sells an insurance policy to a U.S. business firm.
- A Swiss resident receives dividends on her IBM stock.
- Table 10.6 summarizes hypothetical transactions, in billions of U.S. dollars, that took place during a given year.

TABLE 10.6

International Transactions of the United States (Billions of Dollars)

Travel and transportation receipts, net	25
Merchandise imports	450
Unilateral transfers, net	-20
Allocation of SDRs	15
Receipts on U.S. investments abroad	20
Statistical discrepancy	40
Compensation of employees	-5
Changes in U.S. assets abroad, net	-150
Merchandise exports	375
Other services, net	35
Payments on foreign investments in the United States	-10

- a. Calculate the U.S. merchandise trade, services, goods and services, income, unilateral transfers, and current account balances.
 - b. Which of these balances pertains to the net foreign investment position of the United States? How would you describe that position?
11. Given the hypothetical items shown in Table 10.7, determine the international investment position of the United States. Is the United States a net creditor nation or a net debtor nation?

TABLE 10.7**International Investment Position of the United States (Billions of Dollars)**

Foreign official assets in the United States	25
Other foreign assets in the United States	225
U.S. government assets abroad	150
U.S. private assets abroad	75

CHAPTER 1

Foreign Exchange



Among the factors that make international economics a distinct subject is the existence of different national monetary units of account. In the United States, prices and money are measured in terms of the dollar. The *peso* represents Mexico's unit of account, whereas the *franc* and *yen* signify the units of account of Switzerland and Japan, respectively.

A typical international transaction requires two distinct purchases. First, the foreign currency is bought; second, the foreign currency is used to facilitate the international transaction. Before French importers can purchase commodities from U.S. exporters, they must first purchase dollars to meet their international obligation. Some institutional arrangements are required that provide an efficient mechanism whereby monetary claims can be settled with a minimum of inconvenience to both parties. Such a mechanism exists in the form of the foreign exchange market.¹ In this chapter, we will examine the nature and operation of this market.

Foreign Exchange Market

The **foreign exchange market** refers to the organizational setting within which individuals, businesses, governments, and banks buy and sell foreign currencies and other debt instruments.² Only a small fraction of daily transactions in foreign exchange actually involve the trading of currency. Most foreign exchange transactions involve the transfer of electronic balances between commercial banks or foreign exchange dealers. Major U.S. banks such as

¹This chapter considers the foreign exchange market in the absence of government restrictions. In practice, foreign exchange markets for many currencies are controlled by governments; therefore, the range of foreign exchange activities discussed in this chapter are not all possible.

²This section draws from Sam Cross, *The Foreign Exchange Market in the United States*, Federal Reserve Bank of New York, 1998.

JPMorgan Chase or Bank of America maintain inventories of foreign exchange in the form of foreign-denominated deposits held in their branches or correspondent banks in foreign cities. Americans can obtain this foreign exchange from hometown banks that purchase it from Bank of America.

The foreign exchange market is by far the largest and most liquid market in the world. The estimated worldwide amount of foreign exchange transactions is about \$5 trillion a day. Individual trades of \$200 to \$500 million are not uncommon. Quoted prices change as often as 20 times a minute. It has been estimated that the world's most active exchange rates can change up to 18,000 times during a single day.

The foreign exchange market is dominated by four currencies: the U.S. dollar, the euro, the Japanese yen, and the British pound. Not all currencies are traded on the foreign exchange market. Currencies that are not traded are avoided for reasons ranging from political instability to economic uncertainty. Sometimes a country's currency is not exchanged for the simple reason that the country produces very few products of interest to other countries.

Unlike stock or commodity exchanges, the foreign exchange market is not an organized structure. It has no centralized meeting place and no formal requirements for participation. Nor is the foreign exchange market limited to any one country. For any currency, such as the U.S. dollar, the foreign exchange market consists of all locations where dollars are exchanged for other national currencies. Three of the largest foreign exchange markets in the world are located in London, New York, and Tokyo; they handle the majority of all foreign exchange transactions. A dozen or so other market centers also exist around the world in cities such as Paris and Zurich. Because foreign exchange dealers are in constant telephone and computer contact, the market is competitive; it functions no differently than if it were a centralized market.

The foreign exchange market opens on Monday morning in Hong Kong, which is Sunday evening in New York. As the day progresses, markets open in Tokyo, Frankfurt, London, New York, Chicago, San Francisco, and elsewhere. As the West Coast markets of the United States close, Hong Kong is only one hour away from opening for Tuesday business. Indeed, the foreign exchange market is a round-the-clock operation.

A typical foreign exchange market functions at three levels: in transactions between commercial banks and their commercial customers who are the ultimate demanders and suppliers of foreign exchange; in the domestic **interbank market** conducted through brokers; and in active trading in foreign exchange with banks overseas.

Exporters, importers, investors, and tourists buy and sell foreign exchange from and to commercial banks rather than each other. Consider the import of German autos by a U.S. dealer. The dealer is billed for each car it imports at the rate of 50,000 euros per car. The U.S. dealer cannot write a check for this amount because it does not have a checking account denominated in euros. Instead, the dealer goes to the foreign exchange department of, say, Bank of America to arrange payment. If the exchange rate is 1.1 euros = \$1, the auto dealer writes a check to Bank of America for \$45,454.55 (50,000 euros / 1.1 euros = \$45,454.55) per car. Bank of America will then pay the German manufacturer 50,000 euros per car in Germany. Bank of America is able to do this because it has a checking deposit in euros at its branch in Bonn.

The major banks that trade foreign exchange generally do not deal directly with one another but instead use the services of *foreign exchange brokers*. The purpose of a broker is to permit the trading banks to maintain desired foreign exchange balances. If at a particular moment a bank does not have the proper foreign exchange balances, it can turn to a broker to buy additional foreign currency or sell the surplus. Brokers thus provide a wholesale,

interbank market in which trading banks can buy and sell foreign exchange. Brokers are paid a commission for their services by the selling bank.

The third tier of the foreign exchange market consists of the transactions between the trading banks and their overseas branches or foreign correspondents. Although several dozen U.S. banks trade in foreign exchange, it is the major New York banks that usually carry out transactions with foreign banks. Inland trading banks meet their foreign exchange needs by maintaining correspondent relations with the New York banks. Trading with foreign banks permits the matching of supply and demand of foreign exchange in the New York market. These international transactions are carried out primarily by telephone and computers.

Commercial and financial transactions in the foreign exchange market represent large nominal amounts; they are small in comparison to the amounts based on speculation. By far, most of currency trading is based on speculation in which traders purchase and sell for short-term gains based on minute-to-minute, hour-to-hour, and day-to-day price fluctuations. Estimates are that speculation accounts for about 90 percent of the daily trading activity in the foreign exchange market.

Until the 1980s, most foreign exchange trading was done over the phone. However, most foreign exchange trading is now executed electronically. Trading occurs through computer terminals at thousands of locations worldwide. When making a currency trade, a trader will key an order into his or her computer terminal, indicating the amount of a currency, the price, and an instruction to buy or sell. If the order can be filled from other orders outstanding, and it is the best price available in the system from other traders, the deal will be made. If a new order cannot be matched with outstanding orders, the new order will be entered into the system and traders in the system from other banks will have access to it. Another trader may accept the order by pressing a “buy” or “sell” button and a transmit button. Proponents of electronic trading note that there are benefits from the certainty and clarity of trade execution. This is unlike trading via telephone, where conflicts between traders sometimes occur about the supposedly agreed upon currency prices.

Prior to 2000, companies that needed hard currency on a daily basis to meet foreign payrolls or to convert sales in foreign currencies into U.S. dollars traditionally dealt with traders at major banks such as JPMorgan Chase. This required corporate customers to work the phones, talking to traders at several banks at once to get the right quotation. There was little head-to-head competition among the banks, and corporate clients were looking for alternatives. All of this changed when start-up Currenex, Inc. built an online marketplace where banks could compete to offer foreign currency exchange service to companies. The concept was embraced by major banks as well as corporate clients such as The Home Depot. Being online makes the currency trading process more transparent. Corporate clients can see multiple quotes instantly and shop for the best deal.

Foreign Currency Trading Becomes Automated

How would you like to partner with a foreign exchange (forex) trader who is smart, logical, unemotional, continuously looks for profitable trades and executes them immediately, and dispatches the profits to your account? These are the characteristics of automated trading on the foreign exchange market.

Until the 1980s, most foreign exchange trading was done over the phone. However, most foreign exchange trading is now done electronically in an automated forex trading system. In this system, forex trading is conducted by a computer software program that analyzes

currency price charts and other market activity. If the software identifies a currency pair trade (such as the dollar and the euro) that satisfies the predetermined parameters for profitability, it broadcasts a buy or sell alert and automatically makes the trade. Although automated forex trading has existed since the 1970s, it became increasingly popular by the 1990s when Internet-based companies created foreign exchange platforms that provide a quick way for traders to buy and sell foreign exchange. As of 2018, more than 70 percent of all currency transactions were conducted by computer platforms and about 25 percent or more is handled by automated, high-frequency trading firms.

In an automated forex trading system, the trader must first teach the computer software what signals to look for and how to interpret them. This means that specific rules are established for both trade entries and exits that, once programmed, can be automatically executed via a computer. For example, a trader might establish that a trade to purchase the euro will be entered once the 50-day moving average of the euro crosses above the 200-day moving average over the period of five minutes. Once this strategy is built into the software, the trader can turn on the computer, activate the software, and walk away while the software does the trading. However, there is no such thing as a trading strategy that leads to profits 100 percent of the time—losses are part of the game.

Advocates of automated forex trading maintain that the system minimizes emotions through the trading process, thus allowing the currency trader to stick to the plan. Because orders are executed automatically once the trade rules have been fulfilled, traders will not be able to hesitate or question the trade. Also, traders can backtest their rules to historical market data to determine if the rules result in profitable trades, before risking their money in live trading. Furthermore, because computers respond immediately to changing market conditions, automated systems can generate orders as soon as trade rules are fulfilled. Getting in or out of a trade a few seconds earlier can make a big difference in its profitability. As soon as a position is entered, all other orders are automatically generated. Finally, an automated trading system allows the trader to trade multiple accounts or various strategies at one time. This has the potential to spread risk over various instruments while creating a hedge against losing positions.

Although automated forex trading has many advantages, it also has some limitations. Depending on the trading platform, a trade order might reside on a computer, not a server. If an Internet connection fails, an order might not be sent to the market. Also, although it would be great to turn on the computer and leave for the day, automated trading systems do require monitoring. This is due to the potential for mechanical failures, such as connectivity issues, power losses, or computer crashes, and to system quirks. Finally, although not specific to automated trading systems, a poorly constructed set of trading rules for computer software will result in losses for the currency trader.

With the rise of automated trading in the foreign exchange market, the need for human currency traders has dwindled. It appears that foreign exchange traders are becoming much like stock floor traders—a rapidly diminishing breed.³

³Dagfinn Rime, “New Electronic Trading Systems in Foreign Exchange Markets,” in *New Economy Handbook*, Derek Jones, Academic Press, San Diego, CA, 2003; Anthony Webb, “Retail Forex Client: High Frequency Automated FX Trading,” *e-forex Magazine*, January 2005; Ambereen Choudhury and Julia Verlaine, “FX Traders Facing Extinction as Computers Replace Humans,” February 17, 2014, Bloomberg at <http://www.bloomberg.com/news/articles/>; Jean Folger, “The Pros and Cons of Automated Trading Systems,” Investopedia, at <http://www.investopedia.com/articles/>, retrieved April 21, 2016; and Marc Davis, “Forex Automation Software for Hands-Free Trading,” Investopedia, at <http://www.investopedia.com/articles/>, retrieved April 21, 2016.

Types of Foreign Exchange Transactions

When conducting purchases and sales of foreign currencies, banks promise to pay a stipulated amount of currency to another bank or customer at an agreed upon date. Banks typically engage in three types of foreign exchange transactions: spot, forward, and swap.

A **spot transaction** is one in which you can make an outright purchase or sale of a currency *now*, as in “on the spot.” A spot deal will settle (in other words, the physical exchange of currencies takes place) two working days after the deal is struck. The two-day period is known as *immediate delivery*. By convention, the settlement date is the second business day after the date the transaction is agreed to by the two traders. The two-day period provides ample time for the two parties to confirm the agreement and arrange the clearing and necessary debiting and crediting of bank accounts in various international locations. The spot exchange rate is at or close to the current market rate because the transaction occurs in real time and not at some point in the future.

Here’s how a spot transaction works:

- A trader calls another trader and asks for the price of a currency, say the euro. This call expresses only a potential interest in a deal, without the caller indicating whether he or she wants to buy or sell.
- The second trader provides the first trader with prices for both buying and selling.
- When the traders agree to do business, one will send euros and the other will send, say dollars. By convention, the payment is actually made two days later.

Spot dealing has the advantage of being the simplest way to meet foreign currency requirements, but it also carries with it the greatest risk of exchange rate fluctuations, because there is no certainty of the rate until the transaction is made. Exchange rate fluctuations can effectively increase or decrease prices and can be a financial planning ordeal for companies and individuals.

In many cases, a business or financial institution knows it will be receiving or paying an amount of foreign currency on a specific date in the future. In August, a U.S. importer may arrange for a special Christmas season shipment of Japanese radios to arrive in October. The agreement with the Japanese manufacturer may call for payment in yen on October 20. To guard against the possibility of the yen’s becoming more expensive in terms of the dollar, the importer might contract with a bank to buy yen at a stipulated price, but not actually receive them until October 20 when they are needed. When the contract matures, the U.S. importer pays for the yen with a known amount of dollars. This is known as a **forward transaction**. A forward transaction will protect you against unfavorable movements in the exchange rate, but will not allow gains to be made should the exchange rate move in your favor in the period between entering the contract and final settlement of the currency.

Forward transactions differ from spot transactions in that their maturity date is more than two business days in the future. A forward exchange contract’s maturity date can be a few months or even years in the future. The exchange rate is fixed when the contract is initially made. No money necessarily changes hands until the transaction actually takes place, although dealers may require some customers to provide collateral in advance. Notice that in a forward transaction, the buyer and seller are locked into a contract at a fixed price that cannot be affected by any changes in market exchange rates. This tool allows the market participants to plan more safely, because they know in advance what their foreign exchange will cost. It also allows them to avoid an immediate outlay of cash.

Trading foreign currencies among banks and companies also involves swap transactions. A **currency swap** is the conversion of one currency to another currency at one point in

time, with an agreement to convert it to the original currency at a specified time in the future. The rates of both exchanges are agreed to in advance. Here's how a swap transaction works:

- Suppose a U.S. company needs 15 million Swiss francs for a three-month investment in Switzerland.
- It may agree to a rate of 1.5 francs to a dollar and swap \$10 million with a company willing to swap 15 million francs for three months.
- After three months, the U.S. company returns the 15 million francs to the other company and gets back \$10 million, with adjustments made for interest rate differentials.

The key aspect is that the two banks arrange the swap as a single transaction in which they agree to pay and receive stipulated amounts of currencies at specified rates. Swaps provide an efficient mechanism through which traders can meet their foreign exchange needs over a period of time. Traders are able to use a currency for a period in exchange for another currency that is not needed during that time.

Table 11.1 illustrates the distribution of foreign exchange transactions by U.S. banking institutions, by transaction type. Foreign exchange swaps and spot market transactions are the two most important types of foreign exchange transactions.

TABLE 11.1**Global Distribution of Foreign Exchange Transactions, 2016****AVERAGE DAILY VOLUME (BILLIONS OF DOLLARS)**

Foreign Exchange Instrument	Amount	Percentage
Foreign exchange/currency swaps	\$2,460	48.6
Spot transactions	1,652	32.6
Forward transactions	700	13.8
Foreign exchange options	254	5.0
Total	5,066	100.0

Source: From Bank for International Settlements, *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market, 2016*. See also Federal Reserve Bank of New York, 2016, *Triennial Central Bank Survey of Foreign Exchange and Derivatives Market*, available at <http://www.newyorkfed.org/>.

Interbank Trading

In the foreign exchange market, currencies are actively traded around the clock and throughout the world. Banks are linked by telecommunications equipment that permits instantaneous communication. A relatively small number of money center banks carry out most of the foreign exchange transactions in the United States. Virtually all the big New York banks have active currency trading operations, as do their counterparts in London, Tokyo, Hong Kong, Frankfurt, and other financial centers. Large banks in cities such as Los Angeles, Chicago, San Francisco, and Detroit also have active currency trading operations. For most U.S. banks, currency transactions are not a large part of their business; these banks have ties to correspondent banks in New York and elsewhere to conduct currency transactions.

All these banks are prepared to purchase or sell foreign currencies to facilitate speculation for their own accounts and provide trading services for their customers such as corporations, government agencies, and wealthy private individuals. Bank purchases from and sales to their customers are classified as *retail transactions* when the amount involved is less

than 1 million currency units. *Wholesale transactions* involving more than 1 million currency units generally occur between banks or with large corporate customers.

An international community of about 400 banks constitutes the daily currency exchanges for buyers and sellers worldwide. A bank's foreign exchange dealers are in constant contact with other dealers to buy and sell currencies. In most large banks, dealers specialize in one or more foreign currencies. The chief dealer establishes the overall trading policy and direction of trading trying to service the foreign exchange needs of the bank's customers and make a profit for the bank. Currency trading is conducted on a 24-hour basis, and exchange rates may fluctuate at any moment. Bank dealers must be light sleepers, ready to react to a nighttime phone call that indicates exchange rates are moving sharply in foreign markets. Banks often allow senior dealers to conduct exchange trading at home in response to such developments.

With the latest electronic equipment, currency exchanges are negotiated on computer terminals; a push of a button confirms a trade. Dealers use electronic trading boards such as Reuters Dealing and EBS that permit them to instantly register transactions and verify their bank's positions. Besides trading currencies during daytime hours, major banks have established night trading desks to capitalize on foreign exchange fluctuations during the evening and to accommodate corporate requests for currency trades. In the interbank market, currencies are traded in amounts involving at least 1 million units of a specific foreign currency. Table 11.2 lists leading banks that trade in the foreign exchange market.

TABLE 11.2**Top Ten Banks by Share of Foreign Exchange Market, 2016**

Bank	Share of Foreign Exchange Market
Citi (United States)	12.91
JP Morgan (United States)	8.77
UBS (Switzerland)	8.76
Deutsche Bank (Germany)	7.86
Bank of America Merrill Lynch (United States)	6.40
Barclays (United Kingdom)	5.67
Goldman Sachs (United States)	4.65
HSBC (Hong Kong)	4.56
XTX Markets (United Kingdom)	3.87
Morgan Stanley (United States)	3.19

Source: From "Foreign Exchange Survey," *Euromoney*, 2016, available at www.euromoney.com.

How do banks such as Bank of America earn profits in foreign exchange transactions in the interbank market? They quote both a bid and an offer rate to other banks. The **bid rate** refers to the price that the bank is willing to pay for a unit of foreign currency; the **offer rate** is the price at which the bank is willing to sell a unit of foreign currency. The difference between the bid and the offer rate is the **spread**, which varies by the size of the transaction and the liquidity of the currencies being traded. At any given time, a bank's bid quote for a foreign currency will be less than its offer quote. The spread is intended to cover the bank's costs of implementing the exchange of currencies. The large trading banks are prepared to "make a market" in a currency by providing bid and offer rates on request. The use of bid and offer rates allows banks to make profits on foreign exchange transactions in the spot and forward market.

Robust competition between dealer banks for foreign currency business assures that the widths of the spread on various currencies tend to be small. Also, spread widths generally are larger for currencies that are traded less frequently or when currency traders believe that there might be greater risk that the currency's value is likely to decline in the near future.

Foreign exchange dealers who simultaneously purchase and sell foreign currency earn the spread as profit. Citibank might quote bid and offer rates for the Swiss franc at \$0.5851/\$0.5854. The bid rate is \$0.5851 per franc. At this price, Citibank would be prepared to buy 1 million francs for \$585,100. The offer rate is \$0.5854 per franc. Citibank would be willing to sell 1 million francs for \$585,400. If Citibank is able to simultaneously buy and sell 1 million francs, it will earn \$300 on the transaction. This profit equals the spread (\$0.0003) multiplied by the amount of the transaction (1 million francs).

Besides earning profits from a currency's bid/offer spread, foreign exchange dealers attempt to profit by anticipating correctly the future direction of currency movements. Suppose a Citibank dealer expects the Japanese yen to *appreciate* (strengthen) against the U.S. dollar. The dealer will likely *raise* both bid and offer rates, attempting to persuade other dealers to sell yen to Citibank and dissuade other dealers from purchasing yen from Citibank. The bank dealer thus purchases more yen than are sold. If the yen appreciates against the dollar as predicted, the Citibank dealer can sell the yen at a higher rate and earn a profit. Conversely, should the Citibank dealer anticipate that the yen is about to *depreciate* (weaken) against the dollar, the dealer will *lower* the bid and offer rates. Such action encourages sales and discourages purchases; the dealer thus sells more yen than are bought. If the yen depreciates as expected, the dealer can purchase yen back at a lower price to make a profit.

If exchange rates move in the desired direction, foreign exchange traders earn profits. Losses accrue if exchange rates move in the opposite, unexpected direction. To limit possible losses on exchange market transactions, banks impose financial restrictions on their dealers' trading volume. Dealers are subject to *position limits* that stipulate the amount of buying and selling that can be conducted in a given currency. Although banks maintain formal restrictions, they have sometimes absorbed substantial losses from unauthorized trading activity beyond position limits. Because foreign exchange departments are considered by bank management to be profit centers, dealers feel pressure to generate an acceptable rate of return on the bank's funds invested in this operation.

When a bank sells foreign currency to its business and household customers, it charges a "retail" exchange rate. This rate is based on the interbank (wholesale) rate that the bank pays when it buys foreign currency plus a markup that compensates the bank for the services it provides. This markup depends on the size of the currency transaction, the market volatility, and the currency pairs.

Reading Foreign Exchange Quotations

Most daily newspapers publish spot foreign exchange rates for major currencies. The **exchange rate** is the price of one currency in terms of another—the number of dollars required to purchase 1 British pound (£). In shorthand notation, $ER = \$/\pounds$, where ER is the exchange rate. If $ER = 2$, then purchasing £1 will require \$2 ($2/1 = 2$). It is also possible to define the exchange rate as the number of units of foreign currency required to purchase one unit of domestic currency, or $ER' = \pounds/\$$. In our example, $ER' = 0.5$ ($1/2 = 0.5$), which implies that it requires £0.5 to buy \$1. Of course, ER' is the reciprocal of ER ($ER' = 1/ER$).

TABLE 11.3

Foreign Exchange Quotations

Exchange Rates

April 24–25, 2017*

The foreign exchange rates below apply to trading among banks in amounts of \$1 million and more, as quoted at 4:00 P.M. Eastern time by Reuters and other sources. Retail transactions provide fewer units of foreign currency per dollar under \$1 million, carry an additional service charge and are thus made at a different exchange rate.

Country/Currency	In USD		Per USD	
	Tues.	Mon.	Tues.	Mon.
Americas				
Argentina peso	.0649	.0650	15.4170	15.3902
Brazil real	.3177	.3197	3.1472	3.1279
Canada dollar	.7368	.7407	1.3572	1.3501
Chile peso	.001511	.001526	662.00	655.40
Colombia peso	.0003446	.0003483	2902.01	2871.00
Ecuador U.S. dollar	1	1	1	1
Mexico peso	.0530	.0534	18.8601	18.7320
Peru new sol	.3081	.3083	3.246	3.244
Uruguay peso	.03530	.03515	28.3300	28.4500
Venezuela bolivar	.098957	.098617	10.1055	10.1403
Asia-Pacific				
Australian dollar	.7536	.7569	1.3270	1.3212
China yuan	.1452	.1452	6.8882	6.8882
Hong Kong dollar	.1285	.1286	7.7794	7.7788
India rupee	.01556	.01552	64.268	64.435
Indonesia rupiah	.0000752	.0000762	13302	13126
Japan yen	.009001	.009111	111.10	109.76
Malaysia ringgit	.2288	.2272	4.3715	4.4005

Country/Currency	In USD		Per USD	
	Tues.	Mon.	Tues.	Mon.
New Zealand dollar	.6951	.7017	1.4386	1.4351
Pakistan rupee	.00955	.00954	104.725	104.768
Philippines peso	.0201	.0201	49.655	49.655
Singapore dollar	.7174	.7180	1.3939	1.3927
South Korea won	.0008863	.0008815	1128.24	1134.38
Taiwan dollar	.03318	.03304	30.141	30.267
Thailand baht	.02904	.02911	34.440	34.350
Vietnam dong	.00004393	.00004401	22765	22720
Europe				
Czech Rep. koruna	.04070	.04048	24.567	24.703
Denmark krone	.1468	.1461	6.8102	6.8456
Euro area euro	1.0928	1.0868	.9151	.9202
Hungary forint	.003504	.003490	285.35	286.56
Norway krone	.1167	.1170	8.5655	8.5478
Poland zloty	.2588	.2560	3.8640	3.9065
Russia ruble	.01781	.01792	56.139	55.817
Sweden krona	.1140	.1129	8.7748	8.8580
Switzerland franc	1.0062	1.0042	.9938	.9958
Turkey lira	.2794	.2800	3.5797	3.5716
UK pound	1.2841	1.2797	.7788	.7814
Middle East/Africa				
Bahrain dinar	2.6527	2.6527	.3770	.3770
Egypt pound	.0555	.0550	18.0030	18.1790
Israel shekel	.2748	.2739	3.6394	3.6512
Kuwait dinar	3.2835	3.2852	.3046	.3044
Qatar riyal	.2747	.2746	3.640	3.642
Saudi Arabia riyal	.2667	.2666	3.7052	3.7505
South Africa rand	.0766	.0768	13.0580	13.0150

*Monday, April 24, 2017; Tuesday, April 25, 2017.

Source: From Reuters, *Currency Calculator*, at <http://www.reuters.com>. See also Federal Reserve Bank of New York, *Foreign Exchange Rates*, at <http://www.newyorkfed.org/markets/fxrates/ten.AM.Cfm/>.

Table 11.3 shows the spot exchange rates listed for April 24–25, 2017. In columns 2 and 3 of the table, the selling prices of foreign currencies are listed in dollars (USD). The columns state how many U.S. dollars are required to purchase one unit of a given foreign currency. The quote for the Australian dollar for Monday (April 24) was 0.7569. This rate means that 0.7569 U.S. dollar was required to purchase 1 Australian dollar. Columns 4 and 5 (USD) show the foreign exchange rates from the opposite perspective, telling how many units of a foreign currency are required to buy a U.S. dollar. Again referring to Monday, it would take 1.3212 Australian dollars to purchase 1 U.S. dollar.

The term *exchange rate* in the table's heading refers to the price at which a bank will sell foreign exchange in amounts of \$1 million or more to another bank. The table's heading also states at what time during the day the quotation was made (4:00 P.M. Eastern time) because currency prices fluctuate throughout the day in response to changing supply and demand conditions. Retail foreign exchange transactions, in amounts under \$1 million, carry an additional service charge and are thus made at a different exchange rate.

How much does a consumer typically pay for smaller amounts of foreign currency in a retail setting? These retail rates add commissions of 1 to 10 percent, or more. For example:

- Automated teller machines (ATMs) typically add 2 percent and additional service charges in many parts of the world.
- Credit cards typically add 3 percent for the major currencies and more for other currencies.
- Foreign exchange kiosks and banks often add 4 percent when you convert hard cash for the major currencies, and more for other currencies.

An exchange rate determined by free market forces can and does change frequently. When the dollar price of pounds increases, for example, from $\$2 = \text{£}1$ to $\$2.10 = \text{£}1$, the dollar has *depreciated* relative to the pound. Currency **depreciation** means that it takes more units of a nation's currency to purchase a unit of some foreign currency. Conversely, when the dollar price of pounds decreases, say, from $\$2 = \text{£}1$ to $\$1.90 = \text{£}1$, the value of the dollar has *appreciated* relative to the pound. Currency **appreciation** means that it takes fewer units of a nation's currency to purchase a unit of some foreign currency.

In Table 11.3, look at the relation between columns 2 and 3 (USD). Going forward in time from Monday (April 24) to Tuesday (April 25), we see that the U.S. dollar cost of an Australian dollar decreased from $\$0.7569$ U.S. to $\$0.7536$ U.S.; the U.S. dollar thus appreciated against the Australian dollar, and conversely, the Australian dollar depreciated against the U.S. dollar. To verify this conclusion, refer to columns 4 and 5 of the table (USD). Going forward in time from Monday to Tuesday, we see that the Australian dollar cost of the U.S. dollar increased from 1.3212 Australian dollars = $\$1$ U.S. to 1.3270 Australian dollars = $\$1$ U.S. In similar fashion, we see that from Monday to Tuesday the U.S. dollar depreciated against Sweden's krona from $\$0.1129 = 1$ krona to $\$0.1140 = 1$ krona; the krona thus appreciated against the dollar, from 8.8580 krona = $\$1$ to 8.7748 krona = $\$1$.

Most tables of exchange rate quotations express currency values relative to the U.S. dollar, regardless of the country where the quote is provided. Yet in many instances, the U.S. dollar is not part of a foreign exchange transaction. In such cases, the people involved need to obtain an exchange quote between two non-dollar currencies. As an example, if a British importer needs francs to purchase Swiss watches, the exchange rate of interest is the Swiss franc relative to the British pound. The exchange rate between any two currencies (such as the franc and the pound) can be derived from the rates of these two currencies in terms of a third currency (the dollar). The resulting rate is called the **cross exchange rate**.

Referring again to Table 11.3, we see as of Tuesday, the dollar cost of the U.K. pound is $\$1.2841$ and the dollar cost of the Swiss franc is $\$1.0062$. We can then calculate the value of the U.K. pound relative to the Swiss franc as follows:

$$\frac{\$ \text{ Value of U.K. Pound}}{\$ \text{ Value of Swiss Franc}} = \frac{\$1.2841}{\$1.0062} = 1.28 \text{ francs per pound}$$

Each U.K. pound buys about 1.28 Swiss francs; this is the cross exchange rate between the pound and the franc. In similar fashion, cross exchange rates can be calculated between any two non-dollar currencies in Table 11.3. The *NASDAQ Currency Converter* carries out such calculations for you. It can be found at www.nasdaq.com/asp/currency-converter.aspx/.

INTERNATIONAL FINANCE APPLICATION

Yen Depreciation Drives Toyota Profits Upward

In 2013, Japanese automakers found that their vehicles became more affordable for consumers worldwide. Why? The exchange value of the yen was falling. Consider the case of Toyota Motor Corporation.

During 2012–2013, the yen steadily fell against the U.S. dollar as Shinzo Abe, Japan's prime minister, advocated for the decline to improve his automakers' competitiveness in global markets. In 2012, the dollar bought fewer than 80 yen, whereas in 2013, it bought about 100 yen. When Toyota sold a Camry in the United States for \$30,000 in 2012, those dollars were converted into about 2.4 million yen ($\$30,000 \times 80\text{¥} = 2,400,000\text{¥}$). In 2013, Toyota received about 3 million yen from such a sale ($\$30,000 \times 100\text{¥} = 3,000,000\text{¥}$). This amounted to a 25 percent increase in the amount of yen received. That helps explain why Toyota, the world's top-selling automaker, more than doubled its profit during 2012–2013. According to analysts at Morgan Stanley, Toyota receives roughly \$2,000 more per vehicle when the yen depreciates from 78 to 100 yen per dollar.

The currency slide gave Toyota and other Japanese automakers a financial gain on every car that they could



use to reduce prices, boost ads, and improve products, all helping boost U.S. auto sales as the economy strengthened from the Great Recession of 2007–2009.

In 2013, Toyota exported nearly twice as many cars from Japan as Honda Motor Company and Nissan Motor Company, and benefited more than its domestic rivals from the yen's depreciation. However, Toyota officials acknowledged that the currency windfall was temporary, and said it would continue to increase productivity, decrease costs, and improve product quality to increase sales to lessen its vulnerability to currency fluctuations.

What do you think? What would happen to Toyota's profits if the exchange value of the yen appreciated? Why?

Sources: Morgan Stanley, *100 Yen: Global Auto Implications*, April 18, 2013; Hiroko Tabuchi, "Toyota Bounces Back with Help from Eager American Buyers and a Weak Yen," *The New York Times*, May 8, 2013; "Toyota Ups Profit Forecast on Yen Fall," *The Japan Times News*, August 2, 2013; Yoshio Takahashi, "Toyota's Net Soars 70 Percent as Yen Falls," *The Wall Street Journal*, November 7, 2013; Daniel Inman, "Japan's Signals Sink the Yen," *The Wall Street Journal*, November 15, 2013.

Forward and Futures Markets

Foreign exchange can be bought and sold for delivery immediately (**spot market**) or for future delivery (**forward market**). Forward contracts are normally made by those who will receive or make payment in foreign exchange in the weeks or months ahead. As seen in Table 11.3, the New York foreign exchange market is a spot market for most currencies of the world. Regular forward markets exist only for the more widely traded currencies. Exporters and importers, whose foreign exchange receipts and payments are in the future, are the primary participants in the forward market. The forward quotations for currencies such as the U.K. pound, Canadian dollar, Japanese yen, and Swiss franc are for delivery one month, three months, or six months from the date indicated in the table's caption (October 30, 2013).

Trading in foreign exchange can also be done in the **futures market**. In this market, contracting parties agree to future exchanges of currencies and set applicable exchange rates in advance. The futures market is distinguished from the forward market in that only a limited number of leading currencies are traded; trading takes place in standardized contract amounts and in a specific geographic location. Table 11.4 summarizes the major differences between the forward market and the futures market.

TABLE 11.4

Forward Contract versus Futures Contract

	Forward Contract	Futures Contract
Issuer	Commercial bank	International Monetary Market (IMM) of the Chicago Mercantile Exchange and other foreign exchanges such as the Tokyo International Financial Futures Exchange
Trading	“Over the counter” by telephone	On the IMM’s market floor
Contract size	Tailored to the needs of the exporter/importer/investor; no set size	Standardized in round lots
Date of delivery	Negotiable	Only on particular dates
Contract costs	Based on the bid/offer spread	Brokerage fees for sell and buy orders
Settlement	On expiration date only, at prearranged price	Profits or losses paid daily at close of trading

One such futures market is the **International Monetary Market (IMM)** of the Chicago Mercantile Exchange. Founded in 1972, the IMM is an extension of the commodity futures markets in which specific quantities of wheat, corn, and other commodities are bought and sold for future delivery at specific dates. The IMM provides trading facilities for the purchase and sale for future delivery of financial instruments (such as foreign currencies) and precious metals (such as gold). The IMM is especially popular with smaller banks and companies. Also, the IMM is one of the few places where individuals can speculate on changes in exchange rates.

Foreign exchange trading on the IMM is limited to major currencies. Contracts are set for delivery on the third Wednesday of a particular month. Price quotations are in terms of U.S. dollars per unit of foreign currency, but futures contracts are for a fixed amount (for example, 62,500 U.K. pounds).

Here is how to read the IMM’s futures prices as listed in Table 11.5.⁴ The *size of each contract* is shown on the same line as the currency’s name and country. A contract for Japanese yen covers the right to purchase 12.5 million yen. Moving to the right of the size of the contract, we see the expression *\$ per 100 yen*. The first column of the table shows the **maturity months** of the contract; using May as an example, the remaining columns yield the following information:

TABLE 11.5

Foreign Currency Futures, April 24, 2017

	Open	High	Low	Settle	Change	Open Interest
JAPAN YEN (CME)—12.5 million yen; \$ per 100 yen						
May	.9084	.9126	.9070	.9118	-.0046	487
June	.9090	.9139	.9075	.9130	-.0046	202,972

Source: From Chicago Mercantile Exchange, International Monetary Market, available at <http://www.cme.com/trading>.

⁴This section is adapted from R. Wurman and others, *The Wall Street Journal: Guide to Understanding Money and Markets* (New York: Simon and Schuster, Inc., 1990).

Open refers to the price at which the yen was first sold when the IMM opened on the morning of April 24, 2017. Depending on overnight events in the world, the opening price may not be identical to the closing price from the previous trading day. Because prices are expressed in terms of dollars per 100 yen, the .9084 implies that yen opened for sale at \$.9084 per 100 yen. Multiply this price by the size of a contract and you've calculated the full value of one contract at the open of trading for that day: $(\$0.9084 \times 12.5 \text{ million})/100 \text{ yen} = \$113,550$.

The *high*, *low*, and *settle* columns indicate the contract's highest, lowest, and closing prices for the day. Viewed together, these figures provide an indication of how volatile the market for the yen was during the day. After opening at \$.9084 per 100 yen, yen for May delivery never sold for more than \$.9126 per 100 yen and never for less than \$.9070 per 100 yen; trading finally settled, or ended, at \$0.9118 per 100 yen. Multiplying the size of the yen contract times the yen's settlement price gives the full value of a yen contract at the closing of the trading day: $\$0.9118 \times 12.5 \text{ million}/100 \text{ yen} = \$113,975$.

Change compares today's closing price with the closing price as listed in the previous day's paper. A plus (+) sign means prices ended higher; a minus (–) means prices ended lower. In the yen's case, the yen for May delivery settled \$0.0046 per 100 yen lower than it did the previous trading day. *Open interest* refers to the total number of contracts outstanding; that is, those that have not been canceled by offsetting trades. It shows how much interest there is in trading a particular contract.

Foreign Currency Options

During the 1980s, a new feature of the foreign exchange market was developed: the option market. An **option** is simply an agreement between a holder (buyer) and a writer (seller) that gives the holder the *right*, but not the obligation, to buy or sell financial instruments at any time through a specified date. Although the holder is not obligated to buy or sell currency, the writer is obligated to fulfill a transaction. Having a throw-away feature, options are a unique type of financial contract in that you only use the contract if you want to do so. By contrast, forward contracts *obligate* a person to carry out a transaction at a specified price, even if the market has changed and the person would rather not.

Foreign currency options provide an options holder the right to buy or sell a fixed amount of foreign currency at a prearranged price within a few days or a couple of years. The options holder can choose the exchange rate he or she wants to guarantee, as well as the length of the contract. Foreign currency options have been used by companies seeking to hedge against exchange rate risk as well as by speculators in foreign currencies.

There are two types of foreign currency options. A **call option** gives the holder the right to *buy* foreign currency at a specified price, whereas a **put option** gives the holder the right to *sell* foreign currency at a specified price. The price at which the option can be exercised (the price at which the foreign currency is bought or sold) is called the **strike price**. The holder of a foreign currency option has the right to exercise the contract but may choose not to do so if it turns out to be unprofitable. The writer of the options contract (Bank of America, Citibank, and Merrill Lynch) must deliver the foreign currency if called on by a call holder or must buy foreign currency if it is put to them by a put holder. For this obligation, the writer of the options contract receives a *premium*, or fee (option price). Financial institutions have been willing to write foreign currency options because they generate substantial premium income (the fee income on a \$5 million deal can run to \$100,000 or more). Writing currency options is a risky business because the writer takes chances on tricky pricing. Foreign currency options are traded in a variety of currencies in Europe and the United States. *The Wall Street Journal* publishes daily listings of foreign currency options

contracts. It is left for more advanced textbooks to discuss the mechanics of trading foreign currency options.

To see how exporters can use foreign currency options to cope with exchange rate risk, consider the case of Boeing that submits a bid for the sale of jet planes to an airline company in Japan. Boeing must deal not only with the uncertainty of winning the bid but also with exchange rate risk. If Boeing wins the bid, it will receive yen in the future. But what if the yen depreciates in the interim, from 115 yen = \$1 to 120 yen = \$1? Boeing's yen holdings would convert into fewer dollars, eroding the profitability of the jet sale. Because Boeing wants to sell yen in exchange for dollars, it can offset this exchange market risk by purchasing put options that give the company the right to sell yen for dollars at a specified price. Having obtained a put option, if Boeing wins the bid it has limited the exchange rate risk. On the other hand, if the bid is lost, Boeing's losses are limited to the cost of the option. Foreign currency options provide a worst case rate of exchange for companies conducting international business. The maximum amount the company can lose by covering its exchange rate risk is the amount of the option price.

Exchange Rate Determination

What determines the equilibrium exchange rate in a free market? Let us consider the exchange rate from the perspective of the United States—in dollars per unit of foreign currency. Like other prices, the exchange rate in a free market is determined by both supply and demand conditions.

Demand for Foreign Exchange

A nation's *demand for foreign exchange* is a derived demand, corresponding to the *debit* items on a country's balance-of-payments. For example, the U.S. demand for pounds may stem from its desire to import British goods and services, to make investments in Britain, or to make transfer payments to residents in Britain.

Like most demand schedules, the U.S. demand for pounds varies inversely with its price; that is, fewer pounds are demanded at higher prices than at lower prices. This relation is depicted by line D_0 in Figure 11.1. As the dollar depreciates against the pound (the dollar price of the pound rises), British goods and services become more expensive to U.S. importers. This is because more dollars are required to purchase each pound needed to finance the import purchases. The higher exchange rate reduces the number of imports bought, lowering the number of pounds demanded by U.S. residents. In like manner, an appreciation of the U.S. dollar relative to the pound would be expected to induce larger import purchases and more pounds demanded by U.S. residents.

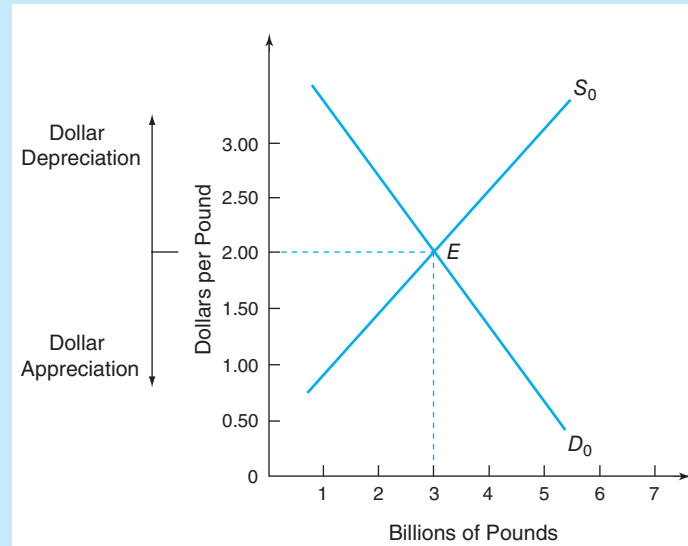
Supply of Foreign Exchange

The *supply of foreign exchange* refers to the amount of foreign exchange that will be offered to the market at various exchange rates, all other factors held constant. The supply of pounds, for example, is generated by the desire of British residents and businesses to import U.S. goods and services, lend funds and make investments in the United States, repay debts owed to U.S. lenders, and extend transfer payments to U.S. residents. In each of these cases, the British offer pounds in the foreign exchange market to obtain the dollars they need to make payments to U.S. residents. Note that the supply of pounds results from transactions that appear on the *credit* side of the U.S. balance-of-payments; one can make a connection between the balance-of-payments and the foreign exchange market.

The supply of pounds is denoted by schedule S_0 in Figure 11.1. The schedule represents the number of pounds offered by the British to obtain dollars with which to buy U.S. goods,

FIGURE 11.1

Exchange Rate Determination



The equilibrium exchange rate is established at the point of intersection of the supply and demand schedules of foreign exchange. The demand for foreign exchange corresponds to the debit items on a nation's balance-of-payments statement; the supply of foreign exchange corresponds to the credit items.

services, and assets. It is depicted in the figure as a positive function of the U.S. exchange rate. As the dollar depreciates against the pound (dollar price of the pound rises), the British will be inclined to buy more U.S. goods. The reason, of course, is that at higher dollar prices of pounds, the British can get more U.S. dollars and hence more U.S. goods per British pound. American goods become cheaper to the British who are induced to purchase additional quantities. As a result, more pounds are offered in the foreign exchange market to buy dollars to pay U.S. exporters.

Equilibrium Rate of Exchange

As long as monetary authorities do not attempt to stabilize exchange rates or moderate their movements, the *equilibrium exchange rate* is determined by the market forces of supply and demand. In Figure 11.1, exchange market equilibrium occurs at point E , where S_0 and D_0 intersect. Three billion pounds will be traded at a price of \$2 per pound. The foreign exchange market is precisely cleared, leaving neither an excess supply nor an excess demand for pounds.

Given the supply and demand schedules of Figure 11.1, there is no reason for the exchange rate to deviate from the equilibrium level. But in practice, it is unlikely that the equilibrium exchange rate will remain long at the existing level. This is because the forces that underlie the location of the supply and demand schedules tend to change over time, causing shifts in the schedules. Should the *demand* for pounds shift *rightward* (an increase in demand), the dollar will *depreciate* against the pound; *leftward* shifts in the demand for pounds (a decrease in demand) cause the dollar to *appreciate*. Conversely, a *rightward* shift

in the *supply* of pounds (increase in supply) causes the dollar to *appreciate* against the pound; a *leftward* shift in the supply of pounds (decrease in supply) results in a *depreciation* of the dollar. The effects of an appreciating and depreciating dollar are summarized in Table 11.6.

TABLE 11.6

Advantages and Disadvantages of a Strengthening and Weakening Dollar

Strengthening (appreciating) dollar

Advantages	Disadvantages
1. U.S. consumers see lower prices on foreign goods.	1. U.S. exporting firms find it harder to compete in foreign markets.
2. Lower prices on foreign goods help keep U.S. inflation low.	2. U.S. firms in import-competing markets find it harder to compete with lower-priced foreign goods.
3. U.S. consumers benefit when they travel to foreign countries	3. Foreign tourists find it more expensive to visit the United States.

Weakening (depreciating) dollar

Advantages	Disadvantages
1. U.S. exporting firms find it easier to sell goods to foreign markets.	1. U.S. consumers face higher prices on foreign goods.
2. Firms in the United States have less competitive pressure to keep prices low.	2. Higher prices on foreign goods contribute to higher inflation in the United States.
3. More foreign tourists can afford to visit the United States.	3. U.S. consumers find traveling abroad more costly.

Indexes of the Foreign Exchange Value of the Dollar: Nominal and Real Exchange Rates

Since 1973, the value of the U.S. dollar in terms of foreign currencies has changed daily. In this environment of market-determined exchange rates, measuring the international value of the dollar is a confusing task. Financial pages of newspapers may be headlining a *depreciation* of the dollar relative to some currencies, while at the same time reporting its *appreciation* relative to others. Such events may leave the general public confused as to the actual value of the dollar.

Suppose the U.S. dollar appreciates 10 percent relative to the yen and depreciates 5 percent against the pound. The change in the dollar's exchange value is some weighted average of the changes in these two bilateral exchange rates. Throughout the day, the value of the dollar may change relative to the values of any number of currencies under market-determined exchange rates. Direct comparison of the dollar's exchange rate over time thus requires a *weighted average* of all the bilateral changes. This average is referred to as the dollar's **exchange rate index**; it is also known as the **effective exchange rate** or the **trade-weighted dollar**.

The exchange rate index is a weighted average of the exchange rates between the domestic currency and the nation's most important trading partners, with weights given by relative importance of the nation's trade with each of these trade partners. One popular index of exchange rates is the so-called "major currency index," which is constructed by the U.S. Federal Reserve Board of Governors. This index reflects the impact of changes in the

dollar's exchange rate on U.S. exports and imports with seven major trading partners of the United States. The base period of the index is March 1973.

Table 11.7 illustrates the **nominal exchange rate index** of the U.S. dollar. This is the average value of the dollar not adjusted for changes in price levels in the United States and its trading partners. An *increase* in the nominal exchange rate index (from year to year) indicates a dollar *appreciation* relative to the currencies of the other nations in the index and a *loss* of competitiveness for the United States. Conversely, a *decrease* in the nominal exchange rate implies dollar *depreciation* relative to the other currencies in the index and an *improvement* in U.S. international competitiveness. The nominal exchange rate index is based on **nominal exchange rates** that do not reflect changes in price levels in trading partners.

A problem arises when interpreting changes in the nominal exchange rate index when prices are not constant. When the prices of goods and services are changing in either the United States or a partner country (or both), one does not know the change in the relative price of foreign goods and services by simply looking at changes in the nominal exchange rate and failing to consider the new level of prices within both countries. If the dollar appreciated against the peso by 5 percent, we would expect that, other things constant, U.S. goods would be 5 percent less competitive against Mexican goods in world markets than was previously the case. Suppose that at the same time, the dollar appreciated; U.S. goods prices increased more rapidly than Mexican goods prices. In this situation, the decrease in U.S. competitiveness against Mexican goods would be more than 5 percent, and the nominal 5 percent exchange rate change would be misleading. Overall international competitiveness of U.S. manufactured goods depends not on the behavior of nominal exchange rates, but on movements in nominal exchange rates relative to prices.

TABLE 11.7**Exchange Rate Indexes of the U.S. Dollar (March 1973 = 100)***

Year	Nominal Exchange Rate Index	Real Exchange Rate Index
1973 (March)	100.0	100.0
1980	87.4	91.3
1984	138.3	117.7
1988	92.7	83.5
1992	86.6	81.8
1996	87.4	85.3
2000	98.3	103.1
2004	85.4	90.6
2008	80.7	88.5
2012	73.6	82.8
2016 (December)	95.8	109.0

*The "major currency index" includes the currencies of the United States, Canada, Euro area, Japan, United Kingdom, Switzerland, Australia, and Sweden.

Source: From Federal Reserve, *Foreign Exchange Rates*, available at <http://www.federalreserve.gov/releases/H10/Summary/>.

As a result, economists calculate the **real exchange rate** that embodies the changes in prices in the countries in the calculation. The real exchange rate is the nominal exchange

rate adjusted for relative price levels. To calculate the real exchange rate, we use the following formula:

$$\text{Real Exchange Rate} = \text{Nominal Exchange Rate} \times \frac{\text{Foreign Country's Price Level}}{(\text{Home Country's Price Level})}$$

where both the nominal exchange rate and real exchange rate are measured in units of domestic currency per unit of foreign currency.

To illustrate, suppose that in 2013 the nominal exchange rate for the United States and Europe is \$0.90 per euro; by 2014 the nominal exchange rate falls to \$0.80 per euro. This is an 11 percent appreciation of the dollar against the euro $[(\$0.90 - \$0.80)/\$0.90 = 0.11]$, leading one to expect a substantial drop in competitiveness of U.S. goods relative to European goods. To calculate the real exchange rate, we must look at prices. Let us assume that the base year is 2013, at which consumer prices are set equal to 100. By 2014, U.S. consumer prices increase to a level of 108 while European consumer prices increase to a level of 102. The real exchange rate would then be calculated as follows:

$$\text{Real Exchange Rate}_{2014} = (\$0.80 \times \$1.02/\$1.08) = \$0.756 \text{ per euro}$$

In this example, the real exchange rate indicates that U.S. goods are *less* competitive on international markets than would be suggested by the nominal exchange rate. This result occurs because the dollar appreciates in nominal terms *and* U.S. prices increase *more* rapidly than European prices. In real terms, the dollar appreciates not by 11 percent (as with the nominal exchange rate) but by 16 percent $[(\$0.90 - \$0.756)/\$0.90 = 0.16]$ for variations in the exchange rate to have an effect on the composition of U.S. output, output growth, employment, and trade, there must be a change in the real exchange rate. The change in the nominal exchange rate must alter the amount of goods and services that the dollar buys in foreign countries. Real exchange rates offer such a comparison and provide a better gauge of international competitiveness than nominal exchange rates.

In addition to constructing a nominal exchange rate index, economists construct a real exchange rate index for a broad sample of U.S. trading partners. Table 11.7 also shows the **real exchange rate index** of the U.S. dollar. This is the average value of the dollar based on real exchange rates. The index is constructed so an appreciation of the dollar corresponds to higher index values. The importance that monetary authorities attach to the real exchange rate index stems from economic theory that states that a rise in the real exchange rate will tend to reduce the international competitiveness of U.S. firms; conversely, a fall in the real exchange rate tends to increase the international competitiveness of U.S. firms.⁵

Arbitrage

We have seen how the supply and demand for foreign exchange can set the market exchange rate. This analysis was from the perspective of the U.S. (New York) foreign exchange market. But what about the relation between the exchange rate in the U.S. market and that in other nations? When restrictions do not modify the ability of the foreign exchange market to operate efficiently, normal market forces result in a consistent relation among the market exchange rates of all currencies. That is to say, if £1 = \$2 in New York, then \$1 = £0.5 in London. The prices for the same currency in different world locations will be identical.

The factor underlying the consistency of the exchange rates is called **exchange arbitrage**. Exchange arbitrage refers to the *simultaneous* purchase and sale of a currency in different

⁵For discussions of the nominal and real exchange rate indexes, see “New Summary Measures of the Foreign Exchange Value of the Dollar,” *Federal Reserve Bulletin*, October 1998, pp. 811–818; and “Real Exchange Rate Indexes for the Canadian Dollar,” *Bank of Canada Review*, Autumn, 1999, pp. 19–28.

foreign exchange markets in order to profit from exchange rate differentials in the two locations. This process brings about an identical price for the same currency in different locations and thus results in one market.

Suppose that the dollar/pound exchange rate is $\text{£}1 = \$2$ in New York but $\text{£}1 = \$2.01$ in London. Foreign exchange traders would find it profitable to purchase pounds in New York at \$2 per pound and immediately resell them in London for \$2.01. A profit of 1 cent would be made on each pound sold, less the cost of the bank transfer and the interest charge on the money tied up during the arbitrage process. This return may appear to be insignificant, but on a \$1 million arbitrage transaction it would generate a profit of approximately \$5,000—not bad for a few minutes' work! As the demand for pounds increases in New York, the dollar price per pound will rise above \$2; as the supply of pounds increases in London, the dollar price per pound will fall below \$2.01. This arbitrage process will continue until the exchange rate between the dollar and the pound in New York is approximately the same as it is in London. Arbitrage between the two currencies thus unifies the foreign exchange markets.

The preceding example illustrates **two-point arbitrage** in which two currencies are traded between two financial centers. A more intricate form of arbitrage involving three currencies and three financial centers is known as **three-point arbitrage**, or triangular arbitrage. Three-point arbitrage involves switching funds among three currencies in order to profit from exchange rate inconsistencies, as seen in the following example.

Consider three currencies—the U.S. dollar, the Swiss franc, and the British pound, all of which are traded in New York, Geneva, and London. Assume the rates of exchange that prevail in all three financial centers are as follows: $\text{£}1 = \$1.50$; $\text{£}1 = 4$ francs; and $1 \text{ franc} = \$0.50$. Because the same exchange rates (prices) prevail in all three financial centers, two-point arbitrage is not profitable. However, these quoted exchange rates are mutually inconsistent. Thus, an arbitrageur with \$1.5 million could make a profit as follows:

1. Sell \$1.5 million for $\text{£}1$ million.
2. Simultaneously, sell $\text{£}1$ million for 4 million francs.
3. At the same time, sell 4 million francs for \$2 million.

The arbitrageur has just made a risk-free profit of \$500,000 ($\$2 \text{ million} - \1.5 million) before transaction costs!

These transactions tend to cause shifts in all three exchange rates that bring them into proper alignment and eliminate the profitability of arbitrage. From a practical standpoint, opportunities for such profitable currency arbitrage have decreased in recent years, given the large number of currency traders—aided by sophisticated computer information systems—that monitor currency quotes in all financial markets. The result of this activity is that currency exchange rates tend to be consistent throughout the world, with only minimal deviations due to transaction costs.

The Forward Market

Foreign exchange markets, as we have seen, may be spot or forward. In the *spot market*, currencies are bought and sold for immediate delivery (generally, two business days after the conclusion of the deal). In the *forward market*, currencies are bought and sold now for future delivery, typically one month, three months, or six months from the date of the transaction. The exchange rate is agreed on at the time of the contract but payment is not made until the future delivery actually takes place. Currency dealers may require some customers to provide collateral in advance to ensure that they fulfill their obligation with the dealer. Only the most widely traded currencies are included in the regular forward market, but

individual forward contracts can be negotiated for most national currencies. Forward contracts are generally valued at \$1 million and more and used by only large businesses. Forward contracts are not generally used by small businesses and consumers.

Banks such as Citibank and Bank of America buy foreign exchange forward agreements from some customers and sell foreign exchange forward agreements to others. Banks provide this service to earn profits. Rather than charging a commission on their currency transactions, banks profit by buying a foreign currency at a lower price (bid price) and selling the foreign currency at a slightly higher price (offer price). For example, Bank of America may set up a contract with Walmart where it will sell the company euros 180 days from now at \$1.20 per euro. This represents the bank's offer rate. As the same time, the bank may have set up a contract with Boeing to buy euros 180 days from now at \$1.19 per euro. The bid/offer spread is thus \$0.01 per euro. The spread is intended to cover the bank's costs involved in accommodating requests to exchange currencies, as well as a profit margin.

The spread between bid and offer rates for a currency is based on the breadth and depth of the market for that currency as well as the currency's volatility. For widely traded currencies, such as the euro and yen, the spread tends to be a smaller amount; less traded currencies, such as the South Korean *won* and the Brazilian *real*, have higher spreads. Moreover, when the exchange values of currencies are fluctuating substantially, spreads tend to widen.

The Forward Rate

The rate of exchange used in the settlement of forward transactions is called the **forward rate**. This rate is quoted in the same way as the spot rate: the price of one currency in terms of another currency. Table 11.8 provides selected forward rates as of May 2, 2017. For example, the selling price of one-month forward Eurozone euros is \$1.0944 per euro; the selling price of three-month forward euros is \$1.0956 per euro; and for six-month forward euros, it is \$1.1013 per euro.

TABLE 11.8

Forward Exchange Rates: Selected Examples

Exchange Rates May 2, 2017

Country/Currency	In US Dollars
Eurozone euro	1.0904
1-month forward	1.0944
3-months forward	1.0956
6-months forward	1.1013
Japan yen	.008933
1-month forward	.008941
3-months forward	.008955
6-months forward	.008996

Source: HSBC (Hongkong and Shanghai Banking Corporation), *Forward Calculator*, at <http://www.hsbcnet.com/gbm/fwcalc-disp#>.

It is customary for a currency's forward rate to be stated in relation to its spot rate. When a foreign currency is worth more (more expensive) in the forward market than in the spot market, it is said to be at a **premium**; conversely, when the currency is worth less (less expensive) in the forward market than in the spot market, it is said to be at a **discount**. The

per annum percentage premium (discount) in forward quotations is computed by the following formula:

$$\text{Premium (discount)} = \frac{\text{Forward Rate} - \text{Spot Rate}}{\text{Spot Rate}} \times \frac{12}{\text{No. of Months Forward}}$$

If the result is a negative forward premium, it means the currency is at a forward discount.

According to Table 11.8, May 2, 2017, the one-month forward euro was selling at \$1.0944, whereas the spot price of the euro was \$1.0904. Because the forward price of the euro was more than the spot price, the euro was at a one-month forward premium of \$0.0040 or at a 4.4 percent forward premium per annum against the dollar:

$$\text{Premium} = \frac{\$1.0944 - \$1.0904}{\$1.0904} \times \frac{12}{1} = 0.044, \text{ or } 4.4 \text{ percent}$$

Note that if the forward price of the euro is less than the spot price, the euro is at a forward discount and a negative sign would appear in front of the forward discount per annum against the dollar.

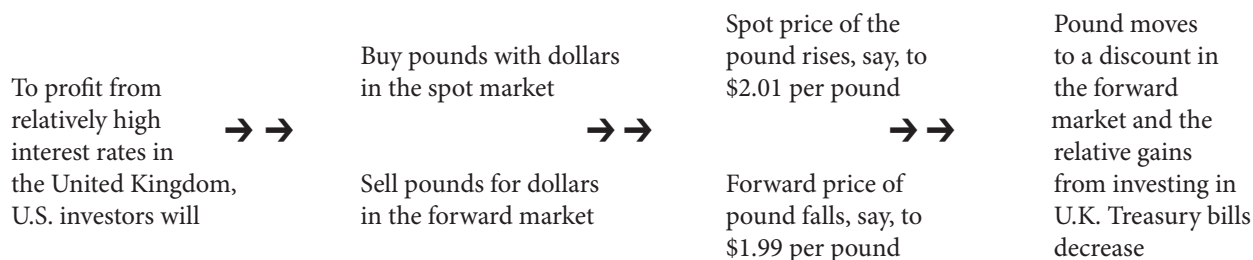
Relation between the Forward Rate and the Spot Rate

Referring to Table 11.8, we see that the one-month forward price of the euro is higher than the spot price; the same applies to the three-month forward price and the six-month forward price. Does this mean that traders in the market expect the spot price for the euro to increase in the future? That is a logical guess, but expectations have little to do with the relation between the forward rate and the spot rate. This relation is purely a mathematically driven calculation.

The forward rate is based on the prevailing spot rate plus (or minus) a premium (or discount) that is determined by the interest rate differential on comparable securities between the two countries involved. If interest rates in the United Kingdom are *higher* than those of the United States, the pound shows a forward *discount* that means the forward rate is less than the spot rate. Conversely, when the United Kingdom's interest rates are *lower* than those of the United States, the pound shows a forward *premium* that means the forward rate is higher than the spot rate.

To illustrate, suppose that the interest rate on three-month Treasury bills is 2 percent in the United States and 6 percent in the United Kingdom; thus, there is a 4 percent interest rate differential in favor of the United Kingdom. Also assume that both the spot rate and the forward rate between the dollar and the pound are identical at \$2 = 1 pound. In this situation, U.S. investors will buy pounds with dollars at the prevailing spot rate and use the pounds to purchase U.K. Treasury bills. To ensure that they do not lose money when pounds are converted into dollars when the Treasury bills reach maturity, they will obtain a three-month forward contract that allows pounds to be sold for dollars at a guaranteed forward rate. When the investors buy pounds with dollars in the spot market, and sell pounds for dollars in the forward market, their actions will drive up the price of the pound in the spot market and drive down the price of the pound in the forward market; thus, the pound moves to a discount in the forward market. The relative gains from interest rate differentials tend to be offset by losses on the foreign exchange conversions, reducing or

eliminating the incentive to invest in U.K. Treasury bills.⁶ The flowchart below illustrates this process.



This is why currencies of countries whose interest rates are relatively high tend to sell at a forward discount relative to the spot rate, and currencies of countries where interest rates are relatively low will tend to sell at a forward premium relative to the spot rate.

International differences in interest rates do exert a major influence on the relation between the spot and forward rates. But on any particular day, one would hardly expect the spread on short-term interest rates between financial centers to precisely equal the discount or premium on foreign exchange, for several reasons. First, changes in interest rate differentials do not always induce an immediate investor response necessary to eliminate the investment profits. Second, investors sometimes transfer funds on an uncovered basis; such transfers do not have an effect on the forward rate. Third, factors such as governmental exchange controls and speculation may weaken the connection between the interest rate differential and the spot and forward rates.

Managing Your Foreign Exchange Risk: Forward Foreign Exchange Contract

Although spot transactions are popular, they leave the currency buyer exposed to potentially dangerous financial risks. Exchange rate fluctuations can effectively increase or decrease prices and can be a financial planning nightmare for companies and individuals. To illustrate exchange risks in spot transactions, assume that a U.S. company orders machine tools from a company in Germany.

- The tools will be ready in six months and will cost 10 million euros.
- At the time of the order, the euro is trading at \$1.40 per euro.
- The U.S. company budgets \$14 million to be paid (in euros) when it receives the tools (10,000,000 euros @ \$1.40 per euro = \$14,000,000).

There is no guarantee that the rate will be the same six months later. Suppose the rate increases to \$1.60 per euro. The cost in U.S. dollars would increase by \$2 million (10,000,000 euros @ \$1.60 per euro = \$16,000,000). Conversely, if the rate decreases to \$1.20 per euro, the cost in U.S. dollars would decrease by \$2 million (10,000,000 euros @ \$1.20 per euro = \$12,000,000).

How can firms and individuals insulate themselves from volatile currency values? They can enter the forward market and engage in **hedging**, the process of avoiding or covering a foreign exchange risk. Consider the following examples of hedging.

⁶According to the theory of interest rate parity, this process will continue until the interest rate differential between the two countries will be exactly offset by a 2 percent forward discount of the pound. When this occurs, the U.S. investors have no incentive to invest in the United Kingdom. It is left for more advanced textbooks to explain this point.

Case 1

A U.S. importer hedges against the dollar *depreciation*. Assume Macy's owes 1 million francs to a Swiss watch manufacturer in three-months' time. During this period, Macy's is in an exposed or *uncovered* position. Macy's bears the risk that the dollar price of the franc might rise in three months (the dollar might depreciate against the franc) say, from \$0.60 to \$0.70 per franc; if so, purchasing 1 million francs would require an extra \$100,000.

To cover itself against this risk, Macy's could immediately buy 1 million francs in the spot market, but this would immobilize its funds for three months. Alternatively, Macy's could contract to purchase 1 million francs in the forward market, at today's forward rate for delivery in three months. In three months, Macy's would purchase francs with dollars at the contracted price and use the francs to pay the Swiss exporter. Macy's has thus hedged against the possibility that francs will be more expensive than anticipated in three months. Hedging in the forward market does not require Macy's to tie up its own funds when it purchases the forward contract. The contract is an obligation that can affect the company's credit. Macy's bank will want to be sure that it has an adequate balance or credit line so that it will be able to pay the necessary amount in three months. Macy's will not be able to benefit if the exchange rate moves in its favor as it has entered into a binding forward contract that it is obliged to fulfill.

Case 2

A U.S. exporter hedges against a dollar *appreciation*. Assume that Microsoft Corporation anticipates receiving 1 million francs in three months from its exports of computer software to a Swiss retailer. During this period, Microsoft is in an *uncovered* position. If the dollar price of the franc falls (the dollar appreciates against the franc) say, from \$0.50 to \$0.40 per franc, Microsoft's receipts will be worth \$100,000 less when the 1 million francs are converted into dollars (1 million francs @ \$0.50 per franc equals \$500,000; 1 million francs @ \$0.40 per franc equals \$400,000).

To avoid this foreign exchange risk, Microsoft can contract to sell its expected franc receipts in the forward market at today's forward rate. By locking into a set forward exchange rate, Microsoft is guaranteed that the value of its franc receipts will be maintained in terms of the dollar, even if the value of the franc should happen to fall.

The forward market eliminates the uncertainty of fluctuating spot rates from international transactions. Exporters can hedge against the possibility that the domestic currency will appreciate against the foreign currency, and importers can hedge against the possibility that the domestic currency will depreciate against the foreign currency. Hedging is not limited to exporters and importers. It applies to anyone who is obligated to make a foreign currency payment or who will enjoy foreign currency receipts at a future time. International investors also make use of the forward market for hedging purposes.

As our examples indicate, importers and exporters participate in the forward market to avoid the risk of fluctuations in foreign exchange rates. Because they make forward transactions mainly through commercial banks, the foreign exchange risk is transferred to those banks. Commercial banks can minimize foreign exchange risk by matching forward purchases from exporters with forward sales to importers. Because the supply of and demand for forward currency transactions by exporters and importers usually do not coincide, the banks may assume some of the risk.

Suppose that on a given day, a commercial bank's forward purchases do not match its forward sales for a given currency. The bank may then seek out other banks in the market that have offsetting positions. Thus, if Bank of America has an excess of 50 million euros in forward purchases over forward sales during the day, it will attempt to find another bank (or banks) that has an excess of forward sales over purchases. These banks can then

enter forward contracts among themselves to eliminate any residual exchange risk that might exist.

How Markel, Volkswagen, and Nintendo Manage Foreign Exchange Risk

To corporate giants such as General Electric and Ford Motor Company, currency fluctuations are a fact of life for global production. But for tiny companies such as Markel Corporation, swings in the world currency market have major implications for its bottom line.⁷ Markel Corporation is a family-owned tubing maker located in Pennsylvania. Its tubing and insulated lead wires are used in the appliance, automotive, and water purification industries. About 40 percent of Markel's products are exported, mostly to Europe.

To shield itself from fluctuations in exchange rates, Markel purchases forward contracts through PNC Financial Services Group in Pittsburgh. Markel promises the bank, say, 50,000 euros in three months, and the bank guarantees a certain number of dollars no matter what happens to the exchange rate. When Markel's financial officers think the dollar is about to appreciate against the euro, they might hedge their entire expected euro revenue stream with a forward contract. When chief financial officers (CFOs) think the dollar is going to depreciate, they will hedge perhaps half and take a chance that they will make more dollars by remaining exposed to currency fluctuations.

However, CFOs don't always guess right. In 2003, for example, Markel had to provide PNC with 50,000 euros from a contract the company purchased three months earlier. The bank paid \$1.05 per euro, or \$52,500. Had Markel waited, it could have sold at the going rate, \$1.08, and made an additional \$1,500.

Another example of hedging against foreign exchange rate fluctuations is provided by Volkswagen, a German auto company. In 2005, Volkswagen announced that it was going to increase its hedging of foreign exchange risk. Volkswagen was exposed to foreign exchange risk because most of its operating costs, especially its labor costs, were denominated in euros, while a substantial share of its revenues were denominated in U.S. dollars. Volkswagen paid its workers in euros and received dollars for the cars it sold in the United States.

Between 2002 and 2004, the euro appreciated considerably relative to the dollar. More dollars were required in order to purchase each euro. Since Volkswagen was unable or unwilling to change the price of cars sold in the United States enough to offset this swing in the exchange rate, the company's dollar revenues from sales in the United States lost substantial value in terms of euros. With costs holding steady and revenues falling, Volkswagen's profits on U.S. operations were reduced by an unfavorable change in the exchange rate between the euro and the dollar.

To avoid similar losses in the future, the company chose to combat the appreciating euro by increasing its hedging of foreign exchange risk. Between 2004 and 2005, Volkswagen more than doubled its use of a variety of currency market contracts. In essence, this hedging strategy involved buying forward contracts for euros at a predetermined rate so that if the euro were to appreciate relative to the dollar and cause an unexpected reduction in dollar revenue, the company would receive an offsetting profit from its forward contract. If the euro were to depreciate and cause an unexpected increase in dollar revenue, the company would incur an offsetting loss from its foreign currency position. In this way, Volkswagen was able to shield its revenue flow from foreign exchange volatility for the duration of its futures contracts.⁸

⁷Drawn from "Ship Those Boxes: Check the Euro," *The Wall Street Journal*, February 7, 2003, p. C1.

⁸"Hedging against Foreign-Exchange Rate Fluctuations," *Economic Report of the President*, 2007, p. 154.

A different foreign currency strategy comes from Nintendo Co., the producer of Super Mario, the DS handheld game system, and the like. In 2010, Nintendo's earnings took a nosedive from the appreciating yen. Unlike other Japanese companies, decreased exports were not the main cause of Nintendo's problems. The bigger issue was its \$7 billion holdings of cash in foreign currencies, mostly the U.S. dollar; this stash represented about 70 percent of Nintendo's total cash holdings. Although Nintendo used forward contracts to hedge some of the risk of an appreciating yen, it made as many overseas payments as possible with dollars rather than converting them into yen and suffer losses. Because the company had to make some payments in yen, such as taxes, it had to ensure that it would always have sufficient yen to cover those payments. Nintendo occasionally converted some of its foreign cash into yen, whenever exchange rates were favorable. Nintendo justified its foreign currency strategy as a way to take advantage of higher interest rates overseas while saving on the costs required for exchanging foreign currencies.

Does Foreign Currency Hedging Pay Off?

How much a company uses hedging depends on the type of business and how predictable its foreign exchange exposures are. Many businesses that conduct transactions abroad generally try to eliminate half of their currency risk. Companies with narrow profit margins, like commodities and agriculture, may hedge four-fifths of their known foreign exchange requirements. However, when currencies are dramatically fluctuating, a prudent hedging policy can become too expensive for many companies. Even the wisest corporate treasurer tends to avoid purely speculative trades on currencies just to increase profits; that is an easy way to lose money with disastrous bets.

Some companies do not hedge at all either because they cannot determine how much money will be coming in from abroad or because they have a deliberate strategy of allowing currencies to balance each other out around the world. As a firm that realizes more than half of its sales in profits in foreign currencies, Minnesota Mining & Manufacturing Co. (3M) is sensitive to fluctuations in exchange rates. As the dollar appreciates against other currencies, 3M's profits decline; as the dollar depreciates, its profits increase. When currency markets go wild like they did during 1997–1998 when Asian currencies and the Russian ruble crashed relative to the dollar, deciding whether or not to hedge is a crucial business decision. Yet 3M didn't use hedges such as the forward market or currency options market to guard against currency fluctuations.⁹

In 1998, the producer of Scotch Tape and Post-Its announced that the appreciating dollar had cost the firm \$330 million in profits and \$1.8 billion in revenue during the previous three years. 3M's no-hedging policy made investors nervous. Was 3M unwise in not hedging its currency risk? Not according to many analysts and other big firms that chose to hedge very little, if at all. Firms ranging from ExxonMobil to Deere to Kodak have maintained that currency fluctuations improve profits as often as they hurt them. Although an appreciation of the dollar would detract from their profits, the dollar depreciation would add to them. As a result, hedging isn't necessary, because the ups and down of currencies even out over the long run.

The standard argument for hedging is increased stability of cash flows and earnings. Surveys of corporate America's largest companies have found that one-third of them do some kind of foreign currency hedging. Drug giant Merck and Co. hedges some of its foreign cash flows using the currency options market to sell the currencies for dollars at fixed rates. Merck maintains that it can protect against adverse currency moves by exercising its options or enjoy favorable moves by not exercising them. Either way, the firm aims to

⁹"Perils of the Hedge Highwire," *Business Week*, October 26, 1998, pp. 74–76.

guarantee that cash flow from foreign sales remains stable so that it can sustain research spending in years when a strong dollar trims foreign earnings. According to Merck's CFO, the firm pays money for insurance to dampen volatility from unknown events.

Yet many well-established companies see no need to pay for protection against currency risk. Instead, they often choose to cover the risks out of their own deep pockets. According to 3M officials, if you consider the cost of hedging over the entire cycle, the drain on your earnings is very high for purchasing that insurance. Foreign currency hedging eats into profits. A simple forward contract that locks in an exchange rate costs up to half a percentage point per year of the revenue being hedged. Other techniques such as currency options are more costly. What's more, fluctuations in a firm's business can detract from the effectiveness of foreign currency hedging.

INTERNATIONAL FINANCE APPLICATION

Currency Risk and the Hazards of Investing Abroad

For an American investor, betting on foreign securities (stocks or bonds) involves additional risks beyond the risks of investing in U.S. securities. These risks include political uncertainty, different financial and accounting standards, different regulatory environments, and different economic factors in countries other than the United States. Currency fluctuations are another risk of investing in foreign securities.

When investors purchase shares in an international securities fund, they gamble on the companies that the fund holds, its performance record, and its management style. They also wager on the local currencies that the foreign securities are denominated in, whether the fund uses currency hedges, and if they want a hedged fund. Some investors do not want to bear the risk of exchange rate fluctuations in addition to equity risk, and they wish to hedge their currency exposure back into dollars. Others see changing exchange rates as a welcome form of diversification. If returns on foreign securities and exchange rate changes both fare well, total returns increase. However, investors can lose money during a period when both perform poorly.

International investors who hedge generally use currency forwards. These are contracts between two parties to buy or sell an amount of currency at a specified future time at a price agreed upon today. The cost of hedging varies over different time periods and with different currencies. That's because it is basically determined by the discrepancy between interest rates in the United States and those in other countries. For large institutional investors, such as an investment company, using forwards is generally economical. Among major currencies such as



the dollar and yen, the forward market is highly liquid and spreads tend to be thin. Hedging more exotic currencies, such as the Russian ruble or Indian rupee, costs a little more. The main disadvantage of hedging is the opportunity cost of not profiting from favorable fluctuations in exchange rates. This is why most international securities funds do not hedge their currency exposure and others hedge only a portion of it. Managers of Oakmark Funds, an international stock fund, hedge only when they have sizable exposure to a currency that they estimate to be at least 20 percent overvalued relative to the dollar.

To provide diversification for its investors, Tweedy, Browne Co., a New York-based investment company, provides two international funds. Introduced in 1993, Tweedy's Global Value Fund uses currency hedges to protect its investors from currency risk. After learning that some of its investors liked the fund's approach to stock selection, but not its hedging policy, Tweedy introduced its Global Value Fund II in 2009. This fund has the same portfolio of stocks as the Global Value Fund but does not hedge. This allows investors the opportunity to profit from favorable fluctuations in exchange rates in addition to favorable movements in stock prices. Investors bear the risk of losing money if adverse fluctuations in exchange rates or stock prices occur.

What do you think? Given the possibility of fluctuating exchange rates, would you be willing to invest in foreign securities?

Sources: Annelena Lobb, "Making Sense of Currency Effects," *The Wall Street Journal*, October 4, 2010, p. R10; and *Global Value Fund* and *Global Value Fund II* at www.tweedy.com.

Interest Arbitrage, Currency Risk, and Hedging

Investors make their financial decisions by comparing the rates of return of foreign investment with those of domestic investment. If rates of return from foreign investment are larger, they will desire to shift their funds abroad. **Interest arbitrage** refers to the process of moving funds into foreign currencies to take advantage of higher investment returns abroad. However, investors face the possibilities of unpredictable losses or gains when the returns from a foreign investment are converted from the foreign currency into the domestic currency. This form of risk is called **currency risk**.

An American who purchases stock in BASF, a German chemical company, will have to buy and sell the stock using the euro. If the euro value of the stock increases by 4 percent, but the euro depreciates against the dollar by 7 percent, the investor will realize a net loss in terms of total returns when selling the stock and converting back to U.S. dollars. The investor can reduce currency risk by using hedges and other techniques designed to offset any currency-related losses. In practice, creating a hedge against a currency can be quite expensive and complicated, and not all investors will choose to adopt this technique, as discussed below.

Uncovered Interest Arbitrage

Uncovered interest arbitrage occurs when an investor does not obtain exchange market cover (hedge) to protect investment proceeds from foreign currency fluctuations. This practice would likely occur if the cost of a hedge against a currency was very expensive. Also, during stable economic times, currencies tend to trade with relatively low volatility, making hedges somewhat unnecessary.

Suppose the interest rate on three-month Treasury bills is 6 percent (per annum) in New York and 10 percent (per annum) in London, and the current spot rate is \$2 per pound. A U.S. investor would seek to profit from this opportunity by exchanging dollars for pounds at the rate of \$2 per pound and using these pounds to purchase three-month British Treasury bills in London. The investor would earn 4 percent more per year, or 1 percent more for the three months, than if the same dollars had been used to buy three-month Treasury bills in New York. These results are summarized in Table 11.9.

TABLE 11.9

Uncovered Interest Arbitrage: An Example

	Rate per Year	Rate per 3 Months
U.K. 3-month Treasury bill interest rate	10%	2.5%
U.S. 3-month Treasury bill interest rate	<u>6%</u>	<u>1.5%</u>
Uncovered interest differential favoring the U.K.	4%	1.0%

It is *not* necessarily true that our U.S. investor realizes an extra 1 percent rate of return (per three months) by moving funds to London. This amount will be realized only if the exchange value of the pound remains constant over the investment period. If the pound *depreciates* against the dollar, the investor makes *less*; if the pound *appreciates* against the dollar, the investor makes *more*.

Suppose our investor earns an extra 1 percent by purchasing three-month British Treasury bills rather than U.S. Treasury bills. Over the same period, suppose the dollar

price of the pound falls from \$2.00 to \$1.99 (the pound *depreciates* against the dollar). When the proceeds are converted back into dollars, the investor *loses* 0.5 percent — $(\$2 - \$1.99)/\$2 = 0.005$. The investor earns only 0.5 percent more (1 percent – 0.5 percent) than if the funds had been placed in U.S. Treasury bills. The reader can verify that if the dollar price of the pound fell from \$2 to \$1.98 over the investment period, the U.S. investor would earn nothing extra by investing in British Treasury bills.

Alternatively, suppose that over the three-month period, the pound rises from \$2 to \$2.02, a 1 percent *appreciation* against the dollar. This time, in addition to the extra 1 percent return on British Treasury bills, our investor realizes a return of 1 percent from the appreciation of the pound. The reason? When the investor bought pounds to finance his or her purchase of British Treasury bills, the investor paid \$2 per pound; when the investor converted his or her investment proceeds back into dollars, the investor received \$2.02 per pound — $(\$2.02 - \$2)/\$2 = 0.01$. Because the pound's appreciation adds to his or her investment's profitability, the investor earns 2 percent more than if the investor had purchased U.S. Treasury bills.

In summary, a U.S. investor's extra rate of return on an investment in the United Kingdom as compared to the United States equals the interest rate differential adjusted for any change in the value of the pound, as follows:

$$\text{Extra Return} = (\text{U.K. Interest Rate} - \text{U.S. Interest Rate}) \\ - \text{Percent Depreciation of the Pound}$$

or

$$\text{Extra Return} = (\text{U.K. Interest Rate} - \text{U.S. Interest Rate}) \\ + \text{Percent Appreciation of the Pound}$$

Covered Interest Arbitrage (Reducing Currency Risk)

Investing funds in a foreign country involves an exchange rate risk. If economic times are quite unstable, currencies tend to trade with relatively high volatility. Hedging against exchange rate fluctuations may be viewed as beneficial, a practice known as covered interest arbitrage.

Covered interest arbitrage involves two basic steps. First, an investor exchanges domestic currency for foreign currency at the current spot rate and uses the foreign currency to finance a foreign investment. At the same time, the investor contracts in the forward market to sell the amount of the foreign currency that will be received as the proceeds from the investment, with a delivery date to coincide with the maturity of the investment. It pays for the investor to make the foreign investment if the positive interest rate differential in favor of the foreign investment more than offsets the cost of obtaining the forward cover.

Suppose the interest rate on three-month Treasury bills is 12 percent (per annum) in London and 8 percent (per annum) in New York; the interest differential in favor of London is 4 percent per annum, or 1 percent for the three months. Suppose also that the current spot rate for the pound is \$2, while the three-month forward pound sells for \$1.99. This means that the three-month forward pound is at a 0.5 percent *discount* — $(\$1.99 - \$2)/\$2 = -0.005$.

By purchasing three-month Treasury bills in London, a U.S. investor could earn 1 percent more for the three months than if he bought three-month Treasury bills in New York. To eliminate the uncertainty over how many dollars will be received when the pounds are reconverted into dollars, the investor sells enough pounds on the three-month forward market to coincide with the anticipated proceeds of the investment. The cost of the

forward cover equals the difference between the spot rate and the contracted three-month forward rate; this difference is the discount on the forward pound, or 0.5 percent. Subtracting this 0.5 percent from the interest rate differential of 1 percent, the investor is able to realize a net rate of return that is 0.5 percent higher than if he or she had bought U.S. Treasury bills. These results are summarized in Table 11.10.

TABLE 11.10**Covered Interest Arbitrage: An Example**

	Rate per Year	Rate per 3 Months
U.K. 3-month Treasury bill interest rate	12%	3%
U.S. 3-month Treasury bill interest rate	<u>8%</u>	<u>2%</u>
Uncovered interest rate differential favoring the U.K.	<u>4%</u>	1%
Forward discount on the 3-month pound		<u>-0.5%</u>
Covered interest rate differential favoring the U.K.		<u>0.5%</u>

This investment opportunity will not last long because the profitability will soon disappear when other U.S. investors make the same investment. As many investors purchase spot pounds, the spot rate will rise. Concurrently, the sale of forward pounds will push the forward rate downward. The result is a *widening* of the discount on the forward pounds that means the cost of covering the exchange rate risk increases. This process tends to continue until the forward discount on the pound widens to 1 percent, at which point the extra profitability of the foreign investment vanishes. The spot rate of the pound might increase from \$2 to \$2.005 per pound and the price of the three-month forward pound might decrease from \$1.99 to \$1.985 per pound; the forward discount on the pound is 1 percent — $(\$1.985 - \$2.005)/\$2 = -0.01$. This offsets the extra 1 percent return that can be made by investing in British Treasury bills rather than U.S. Treasury bills.

Foreign Exchange Market Speculation

Besides being used for the financing of commercial transactions and investments, the foreign exchange market is also used for exchange rate speculation. **Speculation** is the attempt to profit by trading on expectations about prices in the future. Some speculators are traders acting for financial institutions or firms; others are individuals. In either case, speculators buy currencies that they expect to go up in value and sell currencies that they expect to go down in value. In the foreign exchange market, speculators dominate: Close to 90 percent of daily trading volume is speculative in nature.

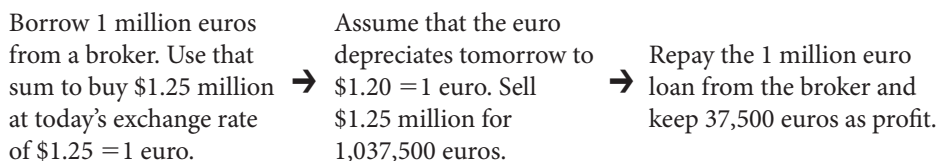
Note the difference between arbitrage and speculation. With arbitrage, a currency trader *simultaneously* buys a currency at a low price and sells that currency at a high price, making a riskless profit. A speculator's goal is to buy a currency at one moment (such as today) and sell that currency at a higher price in the future (such as tomorrow). Speculation implies the deliberate assumption of exchange risk: If the price of the currency falls between today and tomorrow, the speculator loses money. An exchange market speculator deliberately assumes foreign exchange risk on the expectation of profiting from future changes in the spot exchange rate. Speculators assume risk by taking positions in the spot market, forward market, futures market, or options market.

Long and Short Positions

We generally associate making profits in the foreign exchange market by initially buying a currency at a low price and then selling it at a higher price later on; “buy low and sell high.” This is what you are doing when you are in a **long position**: You attempt to realize gains from an expected *appreciation* of a currency.

You can also make a profit by being in a **short position** in which you initially sell currency (that you do not own) at a high price and then buy it back later on at a low price; “sell high and buy low.” You attempt to realize profits from an expected *depreciation* of a currency.

Suppose you want to trade with the U.S. dollar and the euro. Assume that the current exchange rate is 1 euro = \$1.25 (\$1 = 0.80 euros). Also, assume that you borrow 1 million euros from your currency broker and sell this sum to obtain \$1,250,000 (1,000,000 euros \times \$1.25 = \$1,250,000). Suppose the next day the euro’s exchange value depreciates to 1 euro = \$1.20 (\$1 = 0.83 euros). You sell your \$1,250,000 and get 1,037,500 euros (\$1,250,000 \times 0.83 = 1,037,500 euros). You repay your loan for 1 million euros and keep 37,500 euros as profit (minus fees). In this manner, you profit from a depreciation of the euro. The flowchart below illustrates this process.



Let us now consider some examples of foreign exchange speculation.

Andy Krieger Shorts the New Zealand Dollar

One of the greatest currency trades ever made was made in 1987 by 32-year-old Andy Krieger, a currency trader at Bankers Trust Company in New York. Krieger was one of the most aggressive dealers in the world with full approval of his bank. While most of the bank’s currency traders had an upper dealing limit of \$50 million, Krieger’s limit was about \$700 million, a quarter of the bank’s capital at the time. By using foreign currency options, Krieger could greatly leverage his exposure: \$100,000 of currency options would buy control of \$30 to \$40 million in actual currency. In 1987 Krieger did this to launch a speculative attack on the New Zealand dollar.

Krieger was watching the currencies that were appreciating against the dollar following the October 19, 1987 crash in the stock markets around the world. As investors and companies rushed out of the U.S. dollar and into currencies that suffered less damage in the market crash, there were bound to be some currencies that would become overvalued, resulting in a good opportunity for speculative profit. Believing that the New Zealand dollar was overvalued, Krieger bet on its fall, selling hundreds of millions of New Zealand dollars at a time and pushing its value down 5 percent in a day. Krieger profited by re buying New Zealand dollars when its price bottomed out at 59 cents. He profited from a decline in the value of the New Zealand dollar between the sale and the repurchase because he paid less to buy the dollars than he received on selling them. Krieger resigned from Bankers Trust the following year, apparently unhappy about his employers who had paid him a mere \$3 million for his efforts that had netted the bank a profit of more than \$300 million from the raid on the New Zealand dollar.

George Soros Shorts the Pound and Yen

George Soros is a famous currency speculator who has made billions of dollars betting against currencies that he thinks will be worth less in the future (depreciate) compared to another currency. He has been feared by countries trying to protect their weak currencies, such as Malaysia, Thailand, and Britain. Soros is far from a numbers-only speculator. He investigates a country and attempts to identify errors in currency valuation. Political policies in particular draw his interest. Let us consider two of his most famous bets.

Betting against the Pound, 1992 In the original plan for the eurozone, Great Britain was going to join Germany and other European countries as founding members. This required Britain to fix the value of its pound to their currencies. For example, Britain announced its intent to keep its currency at 2.7 marks to the pound. The goal was to gradually reduce exchange rate variability in Europe prior to the introduction of the euro in 1999.

However, cracks began to appear in 1992 when Germany became the economic power of Europe while Britain suffered from inflation and a sluggish economy. Thus, market forces placed pressure on the pound to depreciate against the mark. This caused speculators to wonder how long the fixed exchange rate would prevail between the pound and the mark.

Soros decided that it was time to move. He borrowed and leveraged enough money to sell short \$10 billion dollars' worth of pounds to profit from its expected depreciation against the mark. Soon other currency traders joined Soros in betting heavily against the pound.

In an attempt to offset the pound's depreciation, the Bank of England (central Bank of Great Britain) desperately purchased pounds with its holdings of marks. It also increased British interest rates from 10 to 15 percent to attract capital inflows. However, these actions failed to prevent the pound's depreciation, as the pound dropped by 30 percent during September–December of 1992. The loser was the Bank of England and British taxpayers who lost billions, while the winners were the speculators. Soros was reported to have made more than \$1 billion from his leveraged bet, which cemented his reputation as the premier currency speculator in the world. As for Great Britain, it decided not to join the eurozone.

Betting against the Yen, 2012 In December 2012, Shinzo Abe was elected to become the prime minister of Japan. Abe immediately announced his desire to adopt an expansionary monetary policy amid a sluggish economy: increase the money supply, which results in decreasing interest rates and an increase in domestic spending. A side effect of falling interest rates is a depreciation of the yen as investors are not as inclined to place funds in yen-denominated assets.

With expectations of a future depreciation of the yen, Soros felt that the time was right to make big bets against it. He adopted short positions on the yen to take advantage of its anticipated lower future price. Analysts estimated that Soros made close to \$1 billion profit during November 2012–February 2013 from his bet against the yen.

Betting against the yen is not for the timid. Prior to 2012–2013, Japan had failed for years to lower its currency and stimulate its economy. Many speculators who adopted short positions on the yen lost huge sums when the currency strengthened.

People's Bank of China Widens Trading Band to Punish Currency Speculators

In 2014, the People's Bank of China (the central bank) became increasingly concerned about speculators betting on expected gains in the yuan's exchange value. By purchasing yuan at a relatively low price and selling yuan at a later date as the currency appreciated, speculators could pull profits out of the market. Why did this present a problem for China? As speculators bought yuan, money flowed into China that inflated prices for assets such as

property, because the real estate sector was a favorite destination of speculative capital inflows. Heavy inflows of money from abroad added to the risks of China's banking system and made the economy more vulnerable to financial shocks.

To reduce the amount of money flowing into China, the People's Bank of China sought to remove the notion that speculators had a "one-way bet" on the Yuan; that is the Yuan would necessarily appreciate against the U.S. dollar. This was accomplished in two ways. First, the central bank instructed large state-owned Chinese banks to aggressively purchase dollars with yuan, driving the yuan's value downward against the dollar. Next, the central bank widened the currency's trading band against the dollar. Thus, the Yuan could fluctuate as much as 2 percent on either side of its daily peg against the dollar that is set by the central bank. Previously, the central bank allowed currency traders to push the yuan's daily value 1 percent in either direction of parity. Widening the trading band expanded two-way volatility in the yuan's exchange value and provided greater risk for those considering speculating on the future value of the yuan. Easy currency bets were becoming harder as the Yuan's trading band doubled. These actions helped reduce the money inflows into China.

Observers saw China's move to double the yuan's trading bandwidth as an important step in establishing a market-based exchange rate system in which the yuan would move up and down just like any other currency.

How to Play the Falling (Rising) Dollar

When the dollar is expected to depreciate, U.S. investors may look to foreign markets for big returns. Why? A declining dollar makes foreign-denominated financial instruments worth more in dollar terms. Those in the business emphasize that trading currency is "speculation," not investing. If the dollar rebounds, any foreign-denominated investment would provide lower returns. Big losses can easily occur if your bet is wrong.

The most direct way to play an anticipated drop in the dollar would be to stroll down to Bank of America and purchase \$10,000 of euros, put the bills in your safe deposit box, and convert the currency to dollars in, say, six months. However, it's not an especially efficient way to do the job because of transaction costs.

Another way is to purchase bonds denominated in a foreign currency. A U.S. investor who anticipates that the yen's exchange value will significantly appreciate in the near future might purchase bonds issued by the Japanese government or corporations and expressed in yen. These bonds can be purchased from brokerage firms such as Charles Schwab and JPMorgan Chase & Co. The bonds are paid for in yen that are purchased by converting dollars into yen at the prevailing spot rate. If the yen goes up, the speculator gets not only the accrued interest from the bond but also its appreciated value in dollars. The catch is that, in all likelihood, others have the same expectations. The overall demand for the bonds may be sufficient to force up the bond price, resulting in a lower interest rate. For the investor to win, the yen's appreciation must exceed the loss of interest income. In many cases, the exchange rate changes are not large enough to make such investments worthwhile. Besides investing in a particular foreign bond, one can invest in a foreign bond mutual fund, provided by brokerage firms like Merrill Lynch. Although you can own a foreign bond fund with as little as \$2,500, you generally must pony up \$100,000 or more to own bonds directly.

Rather than investing in foreign bonds, some investors choose to purchase stocks of foreign corporations, denominated in foreign currencies. The investor in this case is trying to predict the trend of not only the foreign currency but also its stock market. The investor must be highly knowledgeable about both financial and economic affairs in the foreign country. Instead of purchasing individual stocks, an investor could put money in a foreign stock mutual fund.

For investors who expect that the spot rate of a foreign currency will soon rise, the answer lies in a savings account denominated in a foreign currency. A U.S. investor may contact a major Citibank branch or a U.S. branch of a foreign bank and take out an interest-bearing certificate of deposit expressed in a foreign currency. An advantage of such a savings account is that the investor is guaranteed a fixed interest rate. An investor who has guessed correctly also enjoys the gains stemming from the foreign currency's appreciation. The investor must be aware of the possibility that governments might tax or shut off such deposits or interfere with the investor's freedom to hold another nation's currency.

Finally, you can play the falling dollar by putting your money into a variety of currency derivatives, all of which are risky. You can trade futures contracts at the Chicago Mercantile Exchange or trade currency directly by opening an account at a firm that specializes in that business, such as Saxo Bank (Danish) or CMC (British). The minimum lot is often \$10,000, and you can leverage up to 95 percent. Thus, for a \$100,000 trade, which is the typical size, you'd have to put only \$5,000 down. For an appreciating dollar, the techniques of currency speculation would be the opposite.

Stabilizing and Destabilizing Speculation

Currency speculation can exert either a stabilizing or a destabilizing influence on the foreign exchange market. **Stabilizing speculation** goes against market forces by *moderating* or *reversing* a rise or a fall in a currency's exchange rate. It would occur when a speculator buys foreign currency with domestic currency when the domestic price of the foreign currency falls, or depreciates. The hope is that the domestic price of the foreign currency will soon increase, leading to a profit. Such purchases increase the demand for the foreign currency that moderates its depreciation. Stabilizing speculation performs a useful function for bankers and businesspeople who desire stable exchange rates.

Destabilizing speculation goes with market forces by *reinforcing* fluctuations in a currency's exchange rate. It can occur when a speculator sells a foreign currency when it depreciates on the expectation that it will depreciate further in the future. Such sales depress the foreign currency's value. Destabilizing speculation can disrupt international transactions in several ways. Because of the uncertainty of financing exports and imports, the cost of hedging may become so high that international trade is impeded. What is more, unstable exchange rates may disrupt international investment activity. This is because the cost of obtaining forward cover for international capital transactions may rise significantly as foreign exchange risk intensifies.

To lessen the amount of destabilizing speculation, some government officials propose government regulation of foreign currency markets. If foreign currency markets are to be regulated by government, will such intervention be superior to the outcome that occurs in an unregulated market? Will government be able to identify better than markets what the "correct" exchange rate is? Many analysts contend that government would make even bigger mistakes. Markets are better than government in admitting their mistakes and reversing out of them. That is because, unlike governments, markets have no pride. Destabilizing speculation will be further discussed in Chapter 15. More can be learned about the techniques of foreign exchange market speculation in *Exploring Further 11.1*, which can be found in MindTap.

Foreign Exchange Trading as a Career

As you complete this international economics course and approach graduating from your college or university, you might consider becoming a foreign exchange trader. You could gain employment with a bank or company dealing in foreign exchange or you might operate independently as a day trader.

Foreign Exchange Traders Hired by Commercial Banks, Companies, and Central Banks

Foreign exchange traders are hired by commercial banks, such as JPMorgan Chase and Bank of America, which make profits by trading and selling exchange from and to each other. Big companies, which have need of foreign currency in the way of doing trade, also hire currency traders. Other employers of currency traders are central banks such as the Federal Reserve, which participate in the foreign exchange market to influence the value of their currencies.

A foreign exchange trader studies the various factors that affect local economies and rates of exchange and then takes advantage of any misvaluations of currencies by buying and selling in different foreign exchange markets. Only those who are comfortable with a high degree of risk and uncertainty should look into this profession as a career. One decision can make you win or lose. Confidence and guts is the core quality required for foreign exchange trading.

A foreign exchange trader has to handle accounts, study various reports generated on each working day, and have an update of the leading economies around the world. Most of a foreign exchange trader's time is spent talking over the phone or working on a computer. The mode of communication in foreign exchange trading has to be extremely swift. Sharp reasoning skills are required to make fast decisions. Economics and mathematics majors have a distinct advantage in applying for positions as a foreign exchange trader. Accounting background is also helpful in keeping track of positions and profit and losses throughout frantic days. A bachelor's degree is required. Few people leave to get an advanced degree in this field.

Early in a foreign exchange trader's career, the trader typically specializes by following one currency and the underlying economy of that currency. As traders gain experience and become confident in handling more than one currency, they can specialize in groups of geographically related countries, such as those that transact in Pacific Rim currencies.

Foreign exchange traders enjoy the adrenaline rush of participating in a hectic market. A trader must be on his toes every minute of the working day because any event around the world can influence the value of a currency and create an opportunity for profit. Most foreign exchange traders report that they are exhausted at day's end. A primer on foreign exchange trading is contained in *Exploring Further 11.2*, which can be found in MindTap.

Do You Really Want to Trade Currencies?

For decades, foreign currency trading was practiced only by the biggest banks and firms like Deutsche Bank and General Electric. Then individual investors in Europe and Asia began trading currencies to pull speculative profits out of the market. By the first decade of the 2000s, many Americans were choosing to participate in this game of electronic poker. These traders range from rock stars and professional athletes to police officers, lawyers, doctors, and teachers.

Consider the case of Marc Coppola, the brother of actor Nicolas Cage and nephew of movie director Francis Ford Coppola. In 2005 he was reported to have won \$1,400 on a \$60,000 bet that the euro would appreciate against the dollar. Then he changed direction and gambled \$40,000 that the euro would depreciate. When it dropped from \$1.31 to \$1.30, he cashed in half of his bet and then soon cashed in the remainder. Coppola noted that he was too cautious: He feared that the euro's exchange value would suddenly reverse its direction, and exited the trade too soon. Coppola wished he had ridden the euro down to an exchange value of about \$1.20, realizing additional speculative profits.

INTERNATIONAL FINANCE APPLICATION

Money Managers Scramble to Pull Off Currency Carry Trades

Currency traders have often used a tried and true way to make money: borrow cheaply in a country with low interest rates and then invest in a country with higher rates. This practice is known as *currency carry trade*.

Here's an example of a yen carry trade. A trader borrows 1000 Japanese yen from a bank in Japan, converts the funds into U.S. dollars, and purchases a U.S. Treasury bond for the equivalent amount. Assume that the Treasury bond pays 5 percent interest and the interest rate in Japan is 1 percent. The trader stands to realize a profit of 4 percent as long as the exchange rate between the yen and dollar does not change. Many professional traders use this trade because the gains can be very large when leverage is taken into account. If the leverage factor is 10:1, meaning that for every 1 unit of the trader's money there are 10 units of borrowed money, the trader can stand to make a profit of 40 percent on our yen carry trade.

However, a major risk of a carry trade is the uncertainty of exchange rates. In our example, if the dollar depreciates against the yen, the trader would run the risk of losing money. Why? The trader would have to pay back more expensive yen, with less valuable dollars, to the Japanese bank. Because carry trade transactions are

usually done with a lot of leverage, a small change in exchange rates can result in large losses unless the carry trade position is adequately hedged.

Since the 1990s, the Japanese yen has been a major currency used in carry trade transactions. Traders would borrow cheaply in Japan, where interest rates were low and the yen was weak, and then invest in a country with

higher rates such as South Africa or Australia. However, changing monetary policies of central banks and shifts in regional economies disrupted this strategy.

In 2015, the Australian dollar and South African rand were depreciating while the Japanese yen was rising against the euro. That forced money managers to look elsewhere to create the same trade. Therefore, they borrowed in Europe, where the euro was at a 12-year low and interest rates were at rock-bottom levels, and invested in countries such as India, the Philippines, and Sri Lanka, where interest rates were higher. Simply put, changing economic conditions forced money managers to scramble for new ways to enact carry trades.



Sources: James Ramage and Anjani Trivedi, "Fumbling the Carry Trade," *The Wall Street Journal*, March 12, 2015; Bert Dohmen, "Carry Trade: The Multi-Trillion Dollar Hidden Market," *Forbes*, September 4, 2014; Euan Stuart, "What Is the Carry Trade?" *Money Week*, August 24, 2007.

The foreign exchange market has become a speculative arena for individual traders. They establish online trading accounts that, like the foreign exchange market itself, operate 24 hours a day. Gain Capital Group, FX Solutions, Interbank FX, and Forex Capital Markets (FXCM) are some of the more popular brokers that provide such accounts. To open an account, speculators need as little as \$250. Brokers allow traders to place bets of as much as 50 times their initial deposits in the United States. A ratio of 50-to-1 means a speculator can put up, say, \$5,000 (referred to as the margin) to place a \$250,000 bet that the dollar will depreciate against the euro. This leverage can quickly magnify small currency moves into sizable gains if the speculator guesses right or sizable losses if the speculator guesses wrong. In Europe and parts of Asia, leverage can reach 200 to 1, or higher.

Compared to other investment opportunities, foreign exchange trading offers several advantages. The around-the-clock market allows speculators to place bets whenever they want, not just between 9:30 A.M. and 4 P.M. Eastern time as with the U.S. stock market. Because transaction costs are smaller, currencies are also less expensive to trade than stocks. Trading is easier because only six pairs of currency (the dollar versus euro) account for about 90 percent of trading volume compared with thousands of stocks. Unlike stocks, there cannot be a bear market in foreign exchange: Because currencies are valued relative to one another, when some currencies depreciate, others appreciate.

Also, foreign exchange trading may be less risky than investing in stocks because currencies often move in multiyear cycles, making it simpler to identify a trend.

However, no one should mistake foreign currency trading for investing. An investment operation is one that, upon thorough analysis, promises safety of principal and a satisfactory return. Operations not fulfilling these requirements are speculative. Concerning currency trading, if you trade on hunches or with the same software tools available to anyone else, your analysis is not thorough. If you use a 50-to-1 margin, your principal is not safe. And if you are out to make a quick killing, you can lose your shirt. Simply put, most individuals who trade foreign currency are not investing at all; they are just speculating. Of course, there is nothing wrong with speculating if you do it for the entertainment value of possibly “beating the house,” and if you have money to burn.

Professional traders caution against amateurs speculating in foreign currencies. They estimate that only 15 percent of day traders realize profits. Although the financial leverage that can be obtained by using an online account can help generate large profits if a speculator guesses correctly, it can result in huge losses if they guess wrong. Currency speculation is a risky business. It is recommended that you do not bet next semester’s tuition on a possible depreciation or appreciation of the dollar.¹⁰

SUMMARY

1. The foreign exchange market provides the institutional framework within which individuals, businesses, and financial institutions purchase and sell foreign exchange. Three of the world’s largest foreign exchange markets are located in New York, Tokyo, and London.
2. The exchange rate is the price of one unit of foreign currency in terms of the domestic currency. From a U.S. viewpoint, the exchange rate might refer to the number of dollars necessary to buy a Swiss franc. The dollar depreciation (appreciation) is an increase (decrease) in the number of dollars required to buy a unit of foreign exchange.
3. In the foreign exchange market, currencies are traded around the clock and throughout the world. Most foreign exchange trading is in the interbank market. Banks typically engage in three types of foreign exchange transactions: spot, forward, and swap.
4. The equilibrium rate of exchange in a free market is determined by the intersection of the supply and demand schedules of foreign exchange. These schedules are derived from the credit and debit items in a nation’s balance-of-payments.
5. Exchange arbitrage permits the rates of exchange in different parts of the world to be kept the same. This is achieved by selling a currency when its price is high and purchasing when the price is low.
6. Foreign traders and investors often deal in the forward market for protection from possible exchange rate fluctuations. However, speculators also buy and sell currencies in the futures markets in anticipation of sizable profits. In general, interest arbitrage determines the relation between the spot rate and the forward rate.
7. Speculation in the foreign exchange markets may be either stabilizing or destabilizing in nature.

¹⁰“Currency Markets Draw Speculation, Fraud,” *The Wall Street Journal*, July 26, 2005, p. C1; and “Young Traders Run Currency Markets,” *The Wall Street Journal*, November 5, 1987, p. A26.

KEY CONCEPTS AND TERMS

Appreciation (p. 384)	Forward market (p. 385)	Premium (p. 394)
Bid rate (p. 381)	Forward rate (p. 394)	Put option (p. 387)
Call option (p. 387)	Forward transaction (p. 379)	Real exchange rate (p. 391)
Covered interest arbitrage (p. 401)	Futures market (p. 385)	Real exchange rate index (p. 392)
Cross exchange rate (p. 384)	Hedging (p. 396)	Short position (p. 404)
Currency risk (p. 401)	Interbank market (p. 376)	Speculation (p. 403)
Currency swap (p. 379)	Interest arbitrage (p. 401)	Spot market (p. 385)
Depreciation (p. 384)	International Monetary Market (IMM) (p. 386)	Spot transaction (p. 379)
Destabilizing speculation (p. 407)	Long position (p. 404)	Spread (p. 381)
Discount (p. 394)	Maturity months (p. 386)	Stabilizing speculation (p. 407)
Effective exchange rate (p. 390)	Nominal exchange rates (p. 391)	Strike price (p. 387)
Exchange arbitrage (p. 392)	Nominal exchange rate index (p. 391)	Three-point arbitrage (p. 393)
Exchange rate (p. 382)	Offer rate (p. 381)	Trade-weighted dollar (p. 390)
Exchange rate index (p. 390)	Option (p. 387)	Two-point arbitrage (p. 393)
Foreign currency options (p. 387)		Uncovered interest arbitrage (p. 401)
Foreign exchange market (p. 375)		

STUDY QUESTIONS

- What is meant by the foreign exchange market? Where is it located?
- What is meant by the forward market? How does it differ from the spot market?
- The supply and demand for foreign exchange are considered to be derived schedules. Explain.
- Explain why exchange rate quotations stated in different financial centers tend to be consistent with one another.
- Who are the participants in the forward exchange market? What advantages does this market afford these participants?
- What explains the relationship between the spot rate and the forward rate?
- What is the strategy of speculating in the forward market? In what other ways can one speculate on exchange rate changes?
- Distinguish between stabilizing speculation and destabilizing speculation.
- If the exchange rate changes from $\$1.70 = \text{£}1$ to $\$1.68 = \text{£}1$, what does this mean for the dollar? For the pound? What if the exchange rate changes from $\$1.70 = \text{£}1$ to $\$1.72 = \text{£}1$?
- Suppose $\$1.69 = \text{£}1$ in New York and $\$1.71 = \text{£}1$ in London. How can foreign exchange arbitrage profit from these exchange rates? Explain how foreign exchange arbitrage results in the same dollar/pound exchange rate in New York and London.
- Table 11.11 shows supply and demand schedules for the British pound. Assume that exchange rates are flexible.

Quantity of Pounds Supplied	Dollars per Pound	Quantity of Pounds Demanded
50	\$2.50	10
40	2.00	20
30	1.50	30
20	1.00	40
10	0.50	50

 - The equilibrium exchange rate equals _____. At this exchange rate, how many pounds will be purchased, and at what cost in terms of dollars?

- b. Suppose the exchange rate is \$2 per pound. At this exchange rate, there is an excess (supply/demand) of pounds. This imbalance causes (an increase/a decrease) in the dollar price of the pound, which leads to (a/an) _____ in the quantity of pounds supplied and (a/an) _____ in the quantity of pounds demanded.
- c. Suppose the exchange rate is \$1 per pound. At this exchange rate, there is an excess (supply/demand) for pounds. This imbalance causes (an increase/a decrease) in the price of the pound that leads to (a/an) _____ in the quantity of pounds supplied and (a/an) _____ in the quantity of pounds demanded.
12. Suppose the spot rate of the pound today is \$1.70 and the three-month forward rate is \$1.75.
- How can a U.S. importer who has to pay 20,000 pounds in three months hedge the foreign exchange risk?
 - What occurs if the U.S. importer does not hedge and the spot rate of the pound in three months is \$1.80?
13. Suppose the interest rate (on an annual basis) on three-month Treasury bills is 10 percent in London and 6 percent in New York, and the spot rate of the pound is \$2.
- How can a U.S. investor profit from uncovered interest arbitrage?
 - If the price of the three-month forward pound is \$1.99, will a U.S. investor benefit from covered interest arbitrage? If so, by how much?
14. Table 11.12 gives hypothetical dollar/franc exchange values for Wednesday, May 5, 2008.
- Fill in the last two columns of the table with the reciprocal price of the dollar in terms of the franc.

TABLE 11.12**Dollar/Franc Exchange Values**

	IN U.S. \$		CURRENCY PER U.S. \$	
	Wed.	Tues.	Wed.	Tues.
Switzerland (franc)	.5851	.5846		
30-day forward	.5853	.5848		
90-day forward	.5854	.5849		
180-day forward	.5851	.5847		

- On Wednesday, the spot price of the two currencies was _____ dollars per franc, or _____ francs per dollar.
 - From Tuesday to Wednesday, in the spot market, the dollar (appreciated/depreciated) against the franc; the franc (appreciated/depreciated) against the dollar.
 - In Wednesday's spot market, the cost of buying 100 francs was _____ dollars; the cost of buying 100 dollars was _____ francs.
 - On Wednesday, the 30-day forward franc was at a (premium/discount) of _____ dollars, which equaled _____ percent on an annual basis. What about the 90-day forward franc?
15. Assume a speculator anticipates that the spot rate of the franc in three months will be lower than today's three-month forward rate of the franc, $\$0.50 = 1$ franc.
- How can this speculator use \$1 million to speculate in the forward market?
 - What occurs if the franc's spot rate in three months is \$0.40? \$0.60? \$0.50?
16. You are given the following spot exchange rates: $\$1 = 3$ francs, $\$1 = 4$ schillings, and 1 franc = 2 schillings. Ignoring transaction costs, how much profit could a person make via three-point arbitrage?

EXPLORING FURTHER

The techniques of foreign exchange market speculation are contained in *Exploring Further 11.1*, which can be found in MindTap.

A primer on foreign exchange trading is contained in *Exploring Further 11.2*, which can be found in MindTap.

Exchange Rate Determination



Since the introduction of market-determined exchange rates by the major industrial nations in the 1970s, notable shifts in exchange rates have been observed. Although changes in long-run exchange rates have tended to undergo relatively gradual shifts, if we examine shorter intervals we see that the exchange rate is volatile. Exchange rates can fluctuate by several percentage points even during a single day. This chapter seeks to explain the forces that underlie fluctuations of exchange rates under a system of market-determined (floating) exchange rates.

What Determines Exchange Rates?

We have learned that foreign exchange markets are highly competitive by nature. Large numbers of sellers and buyers meet in these markets that are located in the major cities of the world and connected electronically to form one worldwide market. Participants in the foreign exchange market have excellent up-to-the-minute information about the exchange rates between any two currencies. As a result, currency values are determined by the unregulated forces of supply and demand as long as central banks do not attempt to stabilize them. The supplies and demands for a currency come from private individuals, corporations, banks, and government agencies other than central banks. In a free market, the equilibrium exchange rate occurs at the point the quantity demanded of a foreign currency equals the quantity of that currency supplied.

To say that supply and demand determine exchange rates in a free market is at once to say everything and to say nothing. If we are to understand why some currencies depreciate and others appreciate, we must investigate the factors that cause the supply and demand schedules of currencies to change. These factors include **market fundamentals** (economic variables) such as productivity, inflation rates, real interest rates, consumer preferences, and

government trade policy. They also include **market expectations** such as news about future market fundamentals and traders' opinions about future exchange rates.¹

Because economists believe that the determinants of exchange rate fluctuations are rather different in the short run (a few weeks or even days), medium run (several months), and long run (one, two, or even five years), we will consider these time frames when analyzing exchange rates. In the *short run*, foreign exchange transactions are dominated by transfers of assets (bank accounts, government securities) that respond to differences in real interest rates and to shifting expectations of future exchange rates; such transactions have a major influence on short-run exchange rates. Over the *medium run*, exchange rates are governed by cyclical factors such as cyclical fluctuations in economic activity. Over the *long run*, foreign exchange transactions are dominated by flows of goods, services, and investment capital that respond to forces such as inflation rates, investment profitability, consumer tastes, productivity, and government trade policy. Because these factors tend to change slowly, their impact on the exchange rate occurs over the long run.

Note that day-to-day influences on foreign exchange rates can cause the rate to move in the opposite direction from that indicated by long-term fundamentals. Although today's exchange rate may be out of line with long-term fundamentals, this should not be construed as implying that it is necessarily inconsistent with short-term determinants—for example, interest rate differentials that are among the relevant fundamentals at the short end of the time dimension.

Figure 12.1 highlights the framework in which exchange rates are determined.² The figure views exchange rates as simultaneously determined by long-run structural, medium-run cyclical, and short-run speculative forces. The figure illustrates the idea that there exists some equilibrium level or path to which a currency will eventually gravitate. This path serves as a long-run magnet or anchor; it ensures that exchange rates will not fluctuate aimlessly without limit but rather will tend to gravitate over time toward the long-run equilibrium path.

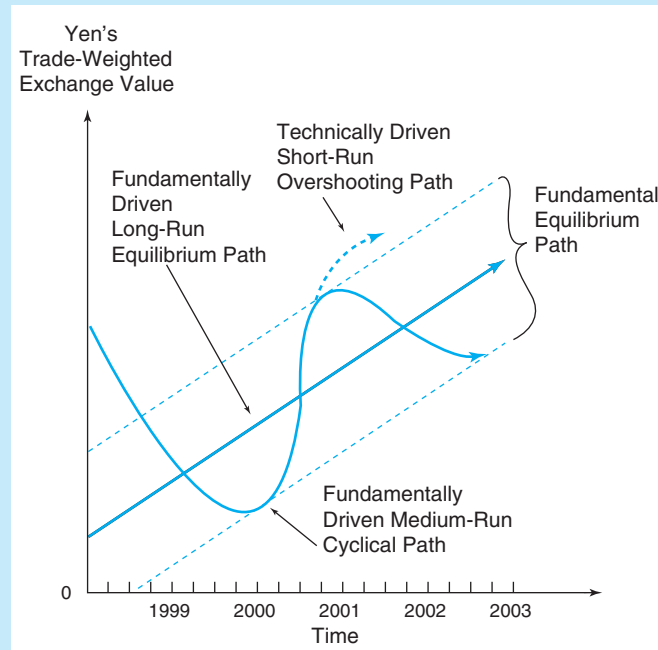
Medium-run cyclical forces can induce fluctuations of a currency above and below its long-run equilibrium path. Fundamental forces serve to push a currency toward its long-run equilibrium path. Note that medium-run cyclical fluctuations from a currency's long-run equilibrium path can be large at times if economic disturbances induce significant changes in either trade flows or capital movements.

Longer run structural forces and medium-run cyclical forces interact to establish a currency's equilibrium path. Exchange rates may sometimes move away from this path if short-run forces (changing market expectations) induce fluctuations in exchange rates beyond those based on fundamental factors. Although such overshooting behavior can persist for significant periods, fundamental forces generally push the currency back into its long-run equilibrium path.

Unfortunately, predicting exchange rate movements is a difficult job. That is because economic forces affect exchange rates through a variety of channels—some may induce negative impacts on a currency's value, others may exert positive impacts. Some of those channels may be more important in determining short run tendencies, whereas other channels may be more important in explaining the long-run trend that a currency follows.

¹This approach to exchange rate determination is known as the balance-of-payments approach. It emphasizes the flow of goods, services, and investment funds and their impact on foreign exchange transactions and exchange rates. The approach predicts that exchange rate depreciation (appreciation) tends to occur for a nation that spends more (less) abroad in combined purchases and investments than it acquires from abroad over a sustained period of time.

²This figure and its analysis are adapted from Michael Rosenberg, *Currency Forecasting* (Homewood, IL: Richard D. Irwin, 1996), pp. 3–5.

FIGURE 12.1**The Path of the Yen's Exchange Rate**

This figure views the exchange value of a nation's currency as being determined by long-run structural, medium-run cyclical, and short-run speculative forces.

To simplify our analysis of exchange rates, we divide it into two parts. First, we consider how exchange rates are determined in the long run. We use our knowledge of the long-run determinants of the exchange rate to help us understand how they are determined in the short run.

Determining Long-Run Exchange Rates

Changes in the long-run value of the exchange rate are due to reactions of traders in the foreign exchange market to changes in four key factors: relative price levels, relative productivity levels, consumer preferences for domestic or foreign goods, and trade barriers. Note that these factors underlie trade in domestic and foreign goods and thus changes in the demand for exports and imports. Table 12.1 summarizes the effects of these factors.

To illustrate the effects of these factors, refer to Figure 12.2, which shows the demand and supply schedules for pounds. Initially, the equilibrium exchange rate is \$1.50 per pound. We will examine each factor by itself, assuming that all other factors remain constant.

Relative Price Levels

Referring to Figure 12.2(a), suppose the domestic price level increases rapidly in the United States and remains constant in the United Kingdom. This causes U.S. consumers to desire relatively low-priced U.K. goods. The demand for pounds increases to D_1 in the figure. Conversely, as the U.K. consumers purchase less relatively high-priced U.S. goods, the supply of pounds decreases to S_1 . The increase in the demand for pounds and the decrease in the

TABLE 12.1**Determinants of the Dollar's Exchange Rate in the Long Run**

Factor*	Change	Effect on the Dollar's Exchange Rate
U.S. price level	Increase	Depreciation
	Decrease	Appreciation
U.S. productivity	Increase	Appreciation
	Decrease	Depreciation
U.S. preferences	Increase	Depreciation
	Decrease	Appreciation
U.S. trade barriers	Increase	Appreciation
	Decrease	Depreciation

*Relative to other countries. The analysis for a change in one determinant assumes that the other determinants are unchanged.

supply of pounds result in a depreciation of the dollar to \$1.60 per pound. This analysis suggests that an increase in the U.S. price level relative to price levels in other countries causes the dollar to depreciate in the long run.

Relative Productivity Levels

Productivity growth measures the increase in a country's output for a given level of input. If one country becomes more productive than other countries, it can produce goods more cheaply than its foreign competitors can. If productivity gains are passed forward to domestic and foreign buyers in the form of lower prices, the nation's exports tend to increase and imports tend to decrease.

Referring to Figure 12.2(b), suppose U.S. productivity growth is faster than that in the United Kingdom. As U.S. goods become relatively less expensive, the United Kingdom demands more U.S. goods, which results in an increase in the supply of pounds to S_2 . Also, Americans demand fewer U.K. goods, which become relatively more expensive, causing the demand for pounds to decrease to D_2 . Therefore, the dollar appreciates to \$1.40 per pound. In the long run, as a country becomes more productive relative to other countries, its currency appreciates.

Preferences for Domestic or Foreign Goods

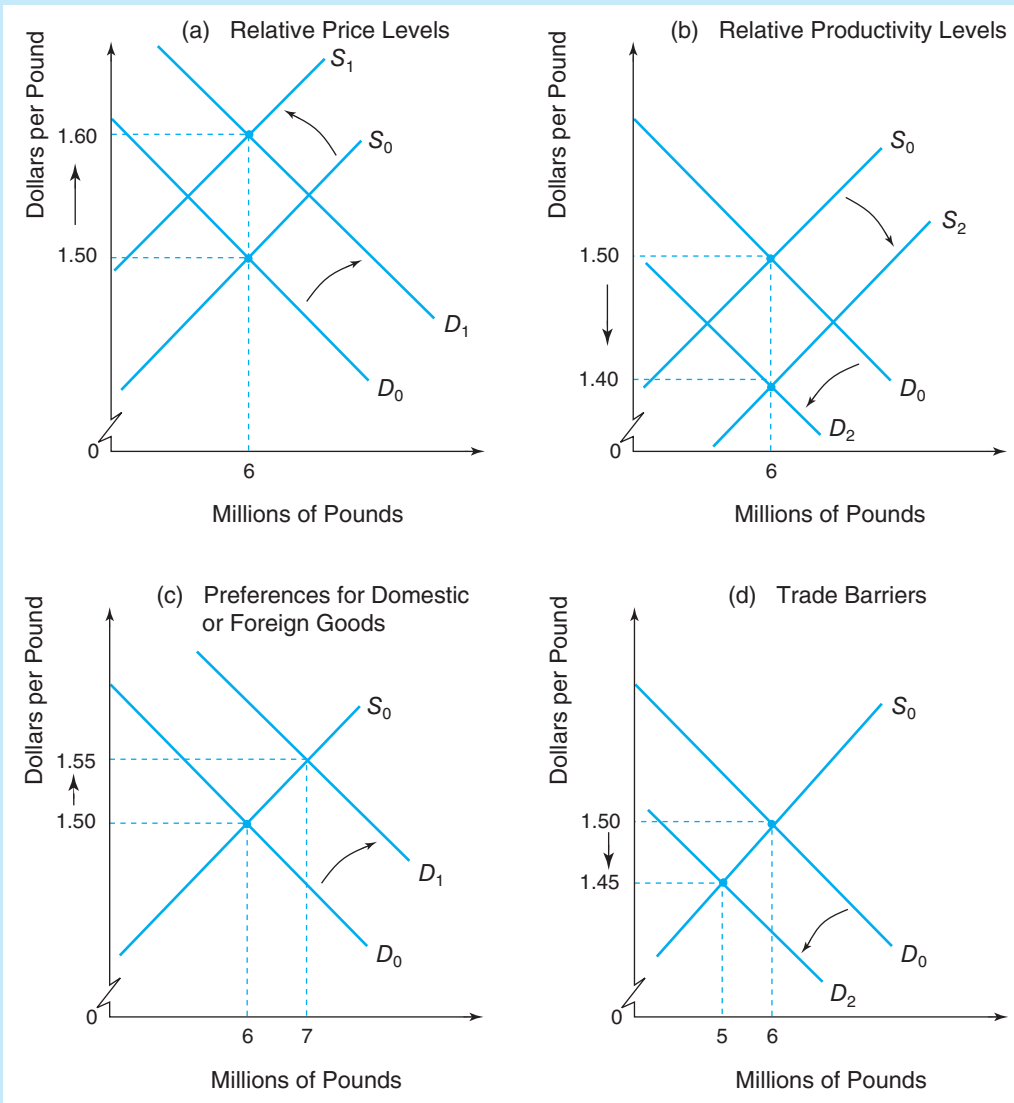
Referring to Figure 12.2(c), suppose that U.S. consumers develop stronger preferences for U.K.-manufactured goods such as automobiles and CD players. The stronger demand for U.K. goods results in Americans demanding more pounds to purchase these goods. As the demand for pounds rises to D_1 , the dollar depreciates to \$1.55 per pound. Conversely, if U.K. consumers demanded additional American computer software, machinery, and apples, the dollar would tend to appreciate against the pound. We conclude that an increased demand for a country's exports causes its currency to appreciate in the long run; conversely, increased demand for imports results in a depreciation in the domestic currency.

Trade Barriers

Barriers to free trade also affect exchange rates. Suppose that the U.S. government imposes tariffs on British steel. By making steel imports more expensive than domestically produced steel, the tariff discourages Americans from purchasing U.K. steel. In Figure 12.2(d), this tariff causes the demand for pounds to decrease to D_2 , which results in an appreciation of the dollar to \$1.45 per pound. Trade barriers such as tariffs and quotas cause a currency appreciation in the long run for the country imposing the barriers.

FIGURE 12.2

Market Fundamentals That Affect the Dollar's Exchange Rate in the Long Run



In the long run, the exchange rate between the dollar and the pound reflects relative price levels, relative productivity levels, preferences for domestic or foreign goods, and trade barriers.

Inflation Rates, Purchasing Power Parity, and Long-Run Exchange Rates

The determinants discussed earlier are helpful in understanding the long-run behavior of exchange rates. Let us now focus on the purchasing-power-parity approach and see how it builds on the relative price determinant of long-run exchange rates.

Law of One Price

The simplest concept of purchasing power parity is the **law of one price**. It asserts that identical goods should be sold everywhere at the same price when converted to a common currency, assuming that it is costless to ship the good between nations, there are no barriers to trade, and markets are competitive. It rests on the assumption that sellers will seek out the highest possible prices and buyers the lowest ones. Any differences that arise are quickly eliminated by arbitrage, the simultaneous buying at a low price and selling at a higher one.

The law of one price holds reasonably well for globally tradable commodities such as oil, metals, chemicals, and some agricultural crops. The law does not appear to apply well to nontradable goods and services such as cab rides, housing, and personal services like haircuts. These products are largely insulated from global competition, and their prices can vary from place to place.

Before the costs of a good in different nations can be compared, its price must first be converted into a common currency. Once converted at the going market exchange rate, the price of an identical good from any two nations should be identical. After converting francs into dollars, machine tools purchased in Switzerland should cost the same as identical machine tools bought in the United States. This means that the purchasing power of the franc and the dollar is at parity and the law of one price prevails.

In theory, the pursuit of profits tends to equalize the price of an identical product in different nations. Assume that machine tools bought in Switzerland are cheaper than the same machine tools bought in the United States, after converting francs into dollars. Swiss exporters could realize a profit by purchasing machine tools in Switzerland at a low price and selling them in the United States at a high price. Such transactions would force prices up in Switzerland and force prices down in the United States until the price of the machine tools would eventually become equal in both nations, whether prices are expressed in francs or dollars. As a result, the law of one price would prevail.

Although the law of one price seems reasonable enough, a look at actual examples shows why a single price might not apply in practice. First, it might not make much sense to buy cheap machine tools in Switzerland and ship them to the United States. It might cost too much to achieve the relatively more expensive prices after shipping the cheaper tools to the United States, setting up distribution networks to sell them, and so forth. These transaction costs might mean that price differences between the tools can persist. Similarly, the existence of U.S. tariffs on imported machine tools might drive a wedge between the prices of the tools in the United States and Switzerland.

Burgeromics: The “Big Mac” Index and the Law of One Price

The Big Mac hamburger sandwich sold by McDonald’s provides an example of the law of one price.

Big Macs are sold in more than 40 countries and have only negligible differences in the recipe. This hamburger sandwich comes close to being an “identical good” that applies to the law of one price. Other global products could be used as a prop in this exercise, such as Coca-Cola or Starbucks coffee, but over the years, the Big Mac Index has been a quick guide to prices in many countries.

Since 1986, each year *The Economist* magazine publishes the Big Mac Index, which is nothing more than an attempt to measure the true equilibrium value of a currency based on one product, a Big Mac. According to the law of one price, a Big Mac should cost the same in a given currency wherever it is purchased in the world, suggesting that the prevailing market exchange rate is the true equilibrium rate. Does this always occur?

The Big Mac Index suggests that the market exchange rate between the dollar and the yen is in equilibrium when it equates the prices of Big Macs in the United States and Japan.

Big Macs would thus cost the same in each country when the prices are converted to the dollar. If Big Macs do not cost the same, the law of one price breaks down. The yen is said to be overvalued or undervalued compared to the dollar. In this manner, the Big Mac Index can be used to determine the extent to which the market exchange rate differs from the true equilibrium exchange rate.

Table 12.2 shows what a Big Mac costs in different countries as of 2017. It turns out that in all of the countries surveyed, the dollar price of the Big Mac was different from the U.S. level, thus violating the law of one price. In the table, the U.S. equivalent prices denote which currencies are overvalued and which are undervalued relative to the dollar. In the United States, a Big Mac costs \$5.06. In Switzerland, the dollar equivalent price of a Big Mac was \$6.35. Compared to the dollar, the Swiss franc was *overvalued* by 25.5 percent ($\$6.35/\$5.06 = 1.255$). However, the Big Mac was a bargain in China, where the U.S. dollar equivalent price was \$2.83; the Chinese yuan was *undervalued* by about 44.1 percent ($\$2.83/\$5.06 = 0.559$).

TABLE 12.2**Big Mac Index, 2017**

Country/Currency	Price of Big Mac in Local Currency	Price of Big Mac in U.S. Dollars*	Local Currency Overvaluation (+) Undervaluation (-) (percent)
United States (dollar)	\$5.06	\$5.06	—
Switzerland (franc)	6.50	6.35	25.5
Norway (krone)	49.0	5.67	12.1
Sweden (krona)	48.0	5.26	4.0
Canada (dollar)	5.98	4.51	-10.9
Euro Area (euro)	3.88	4.06	-19.7
China (yuan)	19.6	2.83	-44.1
Mexico (peso)	49.0	2.23	-55.9

*At market exchange rate, January 12, 2017. The price in each country is based on the average of four cities.

Source: From "Big Mac Currencies," *The Economist*, available at <http://www.economist.com>.

Our Big Mac Index shows that its prices were out of alignment with each other as of 2017. In theory, an arbitrageur could purchase Big Macs for the equivalent of \$2.83 in China, whose yuan was undervalued against the U.S. dollar, and sell them in Switzerland for \$6.35, where the franc was overvalued against the U.S. dollar. This pursuit of profits would push prices up in China and down in Switzerland until the price of Big Macs eventually equalized in the two countries. In practice, such arbitrage trading would not result in price equalization. Big Mac prices show that the law of one price does not hold across countries.

Why do Big Mac prices vary from one nation to another, even when adjusted for exchange rates? One reason is the cost of moving goods across borders. The Big Mac itself is not tradable, but many of its ingredients are. Transportation costs for frozen beef patties, cooking oil, sesame seed buns, and other tradable Big Mac ingredients can create price gaps across countries. The costs imposed by tariffs and other trade barriers can contribute to price disparities between countries because they drive a wedge between these prices. Finally, income disparities help explain why the Big Mac sells at different prices in different countries: Prices tend to be higher in rich countries where people have greater ability to pay higher prices.

To be sure, the Big Mac Index is primitive and has many flaws. However, it is widely understood by noneconomists and serves as an approximation of which currencies are too weak or strong and by how much. Although the Big Mac Index was originally developed for fun, it has turned out to be a surprisingly useful predictor for exchange rate movements. It appears that those who were initially dubious of the validity of the Big Mac Index now realize that it might be something useful on which to chew.

INTERNATIONAL FINANCE APPLICATION

Banks Found Guilty of Foreign Exchange Market Rigging

In 2015, bank regulators determined that five banks were guilty of rigging the foreign exchange market. These banks included Barclays PLC, Citigroup Inc., JPMorgan Chase & Co., Royal Bank of Scotland (RBS), and Union Bank of Switzerland (UBS). The banks agreed to pay \$5.6 billion in fines to settle a foreign exchange manipulation probe among regulators in the United States and Europe.



The probe concluded that the banks manipulated the foreign exchange market for more than five years to increase their profits at the expense of their foreign exchange customers, sometimes threatening the market's integrity. The regulators ordered that these banks cease and desist from further violations and take efforts to implement and strengthen their internal controls and procedures.

The banks' misconduct fell into three categories. First, operating as a group, the banks attempted to manipulate a currency's benchmark that was widely used to set foreign exchange rates across the industry and asset classes. In particular, the banks manipulated the spot market's exchange rate between euros and dollars. Countless individuals and firms around the world rely on these rates to settle financial contracts. This reliance is founded on faith in the fundamental integrity of these benchmarks. The market only works if people have confidence that the process of setting these benchmarks is fair, not corrupted by manipulation by some of the largest banks in the world. Second, the banks sought to initiate stop-loss

orders with customers so as to boost the banks' trading profits. A stop-loss order is placed with a currency broker to buy or sell a currency when it reaches a particular price. Finally, in electronic chat rooms, the banks permitted currency traders to share confidential information about customers, including identities and trades they were seeking to transact. The use of these instant messages allowed the traders to coordinate their buying and selling of currencies at the market close to manipulate foreign exchange prices in their favor.

In the currencies probe, the banks blamed the illegal conduct on a small group of traders and implied the problems were not systemic throughout their firms. The enforcement action by the regulators was intended as a signal to all market participants that wrongdoing and foul play in the foreign exchange market is unacceptable and will not be tolerated.

What do you think? What penalties should be placed on banks that rig the foreign exchange market?

Sources: Aruna Viswanatha, "Banks to Pay \$5.6 Billion to Settle U.S. Probe," *The Wall Street Journal*, May 21, 2015; U.S. Commodity Futures Trading Commission, *CFTC Orders Five Banks to Pay over \$1.4 Billion in Penalties for Attempted Manipulation of Foreign Exchange Benchmark Rates*, November 12, 2014; Suzi Ring, Liam Vaughan, and Jesse Hamilton, "Citigroup, JP Morgan to Pay Most in \$4.3 Billion FX Rigging Cases," <http://www.bloomberg.com/news/>, November 12, 2014; Chiara Albanese, David Enrich, and Katie Martin, "J.P. Morgan, Citigroup Take Brunt of Pact," *The Wall Street Journal*, November 13, 2014; Antoine Gara, "JP Morgan, Citi among Five Banks in \$4.3 Billion Forex Settlement," <http://www.forbes.com/sites/antoinegara/>, November 12, 2014.

Purchasing-Power-Parity

A prominent theory of how exchange rates move is the **purchasing-power-parity theory**. It says that exchange rates adjust to make goods and services cost the same everywhere and thus it is an application of the law of one price.

Our analysis of exchange rates begins by using the law of one price for a single good—steel, as shown in Table 12.3. Assume that the yen price of Japanese steel is 50,000 yen per ton and the dollar price of American steel is \$500 per ton. Therefore, the law of one price

says that the exchange rate between the yen and the dollar is 100 yen per dollar (50,000 yen/ton \div \$500/ton = 100 yen/\$) to ensure that price is the same in both countries. Suppose that the yen price of Japanese steel increases 10 percent, to 55,000 yen per ton, and the dollar price of American steel remains constant at \$500 per ton. According to the law of one price, the exchange rate must increase to 110 yen per dollar (55,000 yen/ton \div \$500/ton = 110 yen/\$), a 10 percent depreciation of the yen. Applying the law of one price to the prices of steel in Japan and the United States, we conclude that if the Japanese price level increases by 10 percent relative to the American price level, the yen will depreciate by 10 percent against the dollar.

TABLE 12.3**The Law of One Price Applied to a Single Product—Steel**

According to the law of one price, if the yen price of steel increases by 10 percent and the dollar price of steel remains constant, the yen will depreciate by 10 percent against the dollar to ensure that price is the same in both countries.

Yen Price of a Ton of Steel	Dollar Price of a Ton of Steel	Exchange Rate: Yen per Dollar
50,000 yen	500	100
55,000	500	110

Although the law of one price can be applied to one good, economists are interested in how exchange rates are determined by looking at the prices of many goods, as measured by a nation's consumer price index or producer price index. The purchasing-power-parity theory provides a generalized explanation of exchange rates based on the prices of many goods. Therefore, the purchasing-power-parity theory is simply the application of the law of one price to national price levels.

According to the purchasing-power-parity theory, what is important are the relative inflationary differences between one economy and the next. If the rate of inflation is much higher in one country, its money has lost purchasing power over domestic goods. We would expect that currency to depreciate to restore parity with prices of goods abroad (the depreciation would make imported goods more expensive to domestic consumers while making domestic exports less expensive to foreigners). Thus, exports and imports of goods and services (trade flows) constitute the mechanism that makes a currency depreciate or appreciate, according to the purchasing-power-parity theory.

Going one step further, the purchasing-power-parity theory suggests that the *changes* in relative national price levels determine *changes* in exchange rates over the long run. The theory predicts that the foreign exchange value of a currency tends to appreciate or depreciate at a rate equal to the difference between foreign and domestic inflation.³

Suppose we compare the consumer price indexes of the United States and Switzerland and find that U.S. inflation exceeds Switzerland's inflation by four percentage points per year. This difference means that the purchasing power of the dollar falls relative to the franc. The exchange value of the dollar against the franc should therefore depreciate

³This chapter presents the so-called *relative version* of the purchasing-power-parity theory, which addresses changes in prices and exchange rates over a period of time. Another variant is the *absolute version*, which states that the equilibrium exchange rate will equal the ratio of domestic to foreign prices of an appropriate market basket of goods and services at a given point in time.

4 percent per year, according to the purchasing-power-parity theory. Conversely, the U.S. dollar should appreciate against the franc if U.S. inflation is less than Switzerland's inflation.

The purchasing-power-parity theory can be used to predict long-run exchange rates. We'll consider an example using the price indexes (P) of the United States and Switzerland. Letting 0 be the base period and 1 represent period 1, the purchasing-power-parity theory is given in symbols as follows:

$$S_1 = S_0 \frac{P_{US1}/P_{US0}}{P_{S1}/P_{S0}}$$

where S_0 equals the equilibrium exchange rate existing in the base period and S_1 equals the estimated target at which the actual rate should be in the future.

Let the price indexes of the United States and Switzerland and the equilibrium exchange rate be as follows:

$$\begin{array}{l} P_{US0} = 100 \quad P_{S0} = 100 \quad S_0 = \$0.50 \\ P_{US1} = 200 \quad P_{S1} = 100 \end{array}$$

Putting these figures into the previous equation, we can determine the new equilibrium exchange rate for period 1:

$$S_1 = \$0.50 \left(\frac{200/100}{100/100} \right) = \$0.50 (2) = \$1.00$$

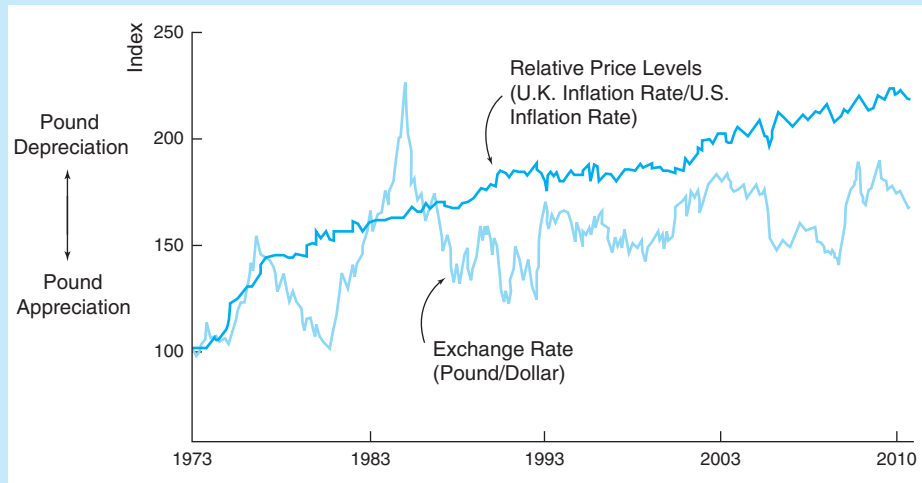
Between one period and the next, the U.S. inflation rate rose 100 percent, whereas Switzerland's inflation rate remained unchanged. Maintaining purchasing power parity between the dollar and the franc requires the dollar to depreciate against the franc by an amount equal to the difference in the percentage rates of inflation in the United States and Switzerland. The dollar must depreciate by 100 percent, from \$0.50 per franc to \$1 per franc, to maintain its purchasing power parity. If the example assumed instead that Switzerland's inflation rate doubled while the U.S. inflation rate remained unchanged, the dollar would appreciate to a level of \$0.25 per franc, according to the purchasing-power-parity theory.

Although the purchasing-power-parity theory can be helpful in forecasting appropriate levels to which currency values should be adjusted, it is not an infallible guide to exchange rate determination. For instance, the theory overlooks the fact that exchange rate movements may be influenced by investment flows. The theory also faces the problems of choosing the appropriate price index to be used in price calculations (consumer prices or producer prices) and of determining the equilibrium period to use as a base. Government policy may interfere with the operation of the theory by implementing trade restrictions that disrupt the flow of exports and imports among nations.

The predictive power of the purchasing-power-parity theory is most evident in the long run. From 1973 to 2003, the U.K. price level increased about 99 percent relative to the U.S. price level as shown in Figure 12.3. As the purchasing-power-parity theory forecasts, the pound depreciated against the dollar by about 73 percent during this period, although this amount is less than the 99 percent increase forecasted by the theory. The figure shows that the purchasing-power-parity theory has negligible predictive power in the short run. From 1985 to 1988, the British price level increased relative to the U.S. price level. Rather than depreciating, as the purchasing-power-parity theory predicts, the pound actually appreciated against the dollar. The purchasing-power-parity theory is most appropriate for **forecasting exchange rates** in the long run; in the short run, it is a poor forecaster.

FIGURE 12.3

Purchasing Power Parity: United States–United Kingdom, 1973–2011



This figure suggests that the predictive power of the purchasing-power-parity theory is most evident in the long run. In the short run, the theory has negligible predictive power.

Source: *Economic Report of the President and National Statistics Online*, available at <http://www.statistics.gov.uk/>.

Determining Short-Run Exchange Rates: The Asset Market Approach

We have seen that exchange rate fluctuations in the long-run stem from volatility in market fundamentals including relative price levels (purchasing power parity), relative productivity levels, preferences for domestic or foreign goods, and trade barriers. However, fluctuations in exchange rates are sometimes too large and too sudden to be explained solely by such factors. Exchange rates can change by two percentage points or more in a single day. But variations in the determinants usually do not occur frequently or significantly enough to fully account for such exchange rate irascibility. Therefore, to understand why exchange rates can fluctuate sharply in a particular day or week, we must consider other factors besides relative price level behavior, productivity trends, preferences, and trade barriers. We need to develop a framework that can demonstrate why exchange rates fluctuate in the short run.

To understand short-run exchange rate behavior, it is important to recognize that foreign exchange market activity is dominated by investors in assets such as Treasury securities, corporate bonds, bank accounts, stocks, and real property. Today, only about 2 percent of all foreign exchange transactions are related to the financing of exports and imports. This relation suggests that about 98 percent of foreign exchange transactions are attributable to assets being traded in global markets. Because these markets are connected by sophisticated telecommunication systems and trading occurs on a 24-hour basis, investors in financial assets can trade rapidly and modify their outlooks of currency values almost instantaneously. Over

short periods such as a month, decisions to hold domestic or foreign assets play a much greater role in exchange rate determination than the demand for imports and exports does.

According to the **asset market approach**, investors consider two key factors when deciding between domestic and foreign investments: relative levels of interest rates and expected changes in the exchange rate itself over the term of the investment. These factors account for fluctuations in exchange rates that we observe in the short run. Table 12.4 summarizes the effects of these factors.

TABLE 12.4**Determinants of the Dollar's Exchange Rate against the Pound in the Short Run**

Change in Determinant*	Repositioning of International Financial Investment	Effect on Dollar's Exchange Rate
U.S. Interest Rate		
Increase	Toward dollar-denominated assets	Appreciates
Decrease	Toward pound-denominated assets	Depreciates
British Interest Rate		
Increase	Toward pound-denominated assets	Depreciates
Decrease	Toward dollar-denominated assets	Appreciates
Expected Future Change in the Dollar's Exchange Rate		
Appreciate	Toward dollar-denominated assets	Appreciates
Depreciate	Toward pound-denominated assets	Depreciates

*The analysis for a change in one determinant assumes that the other determinants are unchanged.

Relative Levels of Interest Rates

The level of the **nominal** (money) **interest rate** is a first approximation of the rate of return on assets that can be earned in a particular country. Differences in the level of nominal interest rates between economies are likely to affect international investment flows, as investors seek the highest rate of return.

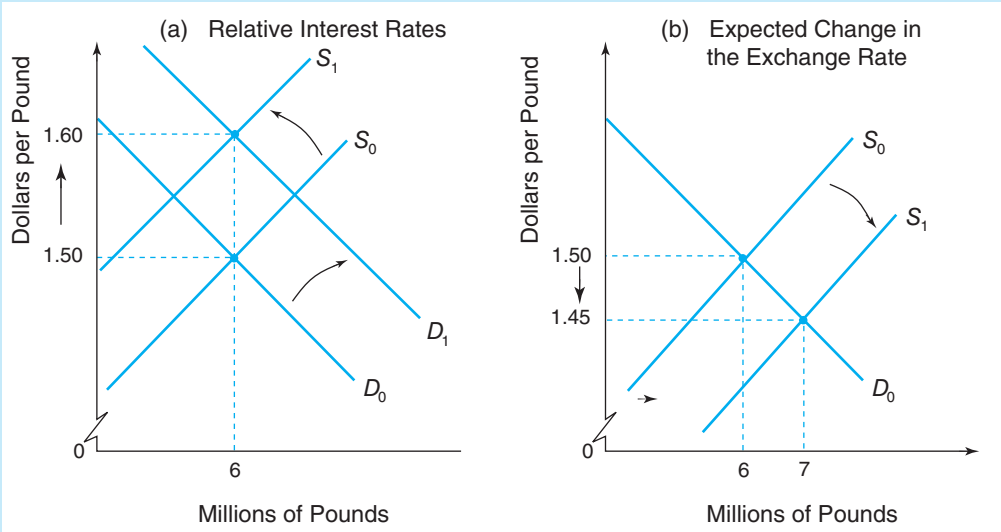
When interest rates in the United States are significantly higher than interest rates abroad, the foreign demand for U.S. securities and bank accounts will increase, that increases the demand for the dollars needed to buy those assets, thus causing the dollar to appreciate relative to foreign currencies. In contrast, if interest rates in the United States are on average lower than interest rates abroad, the demand for foreign securities and bank accounts strengthens and the demand for U.S. securities and bank accounts weakens. This weakness will cause the demand for foreign currencies needed to buy foreign assets to increase and the demand for the dollar to decrease, resulting in a depreciation of the dollar relative to foreign currencies.

To illustrate the effects of relative interest rates as a determinant of exchange rates, refer to Figure 12.4; it shows the demand and supply schedules for pounds. Initially, the equilibrium exchange rate is \$1.50 per pound. Referring to Figure 12.4(a), assume that an expansionary monetary policy of the U.S. Federal Reserve results in a fall in interest rates to 3 percent, while interest rates in the United Kingdom are at 6 percent. U.S. investors will be attracted to the relatively high interest rates in the United Kingdom and will demand more pounds to buy U.K. Treasury bills. The demand for pounds rises to D_1 in the figure. Concurrently, the U.K.

investors will find investing in the United States less attractive than before, so fewer pounds will be offered to buy dollars for purchases of U.S. securities. The supply of pounds decreases to S_1 in the figure. The combined effect of these two shifts is to cause the dollar to depreciate to \$1.60 per pound. Alternatively, if interest rates were lower in the United Kingdom than in the United States, the dollar would appreciate against the pound as Americans made fewer investments in the United Kingdom and the U.K. investors made more investments in the United States.

FIGURE 12.4

Factors Affecting the Dollar's Exchange Rate in the Short Run



In the short run, the exchange rate between the dollar and the pound reflects relative interest rates and expected changes in the exchange rate.

Things may not always be so simple concerning the relation between interest rates, investment flows, and exchange rates. It is important to distinguish between the nominal interest rate and the **real interest rate** (the nominal interest rate minus the inflation rate).

$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}$$

For international investors, it is the relative changes in the real interest rate that matter.

If a rise in the nominal interest rate in the United States is accompanied by an equal rise in the U.S. inflation rate, the real interest rate remains constant. In this case, higher nominal interest rates do not make dollar-denominated securities more attractive to U.K. investors. This is because rising U.S. inflation will encourage U.S. buyers to seek out low-priced U.K. goods that will increase the demand for pounds and cause the dollar to depreciate. British investors will expect the exchange rate of the dollar in terms of the pound to depreciate along with the declining purchasing power of the dollar. The higher nominal return on U.S. securities will be offset by the expectation of a lower future exchange rate, leaving the motivation for increased U.K. investment in the United States unaffected. Only if

higher nominal interest rates in the United States signal an increase in the real interest rate will the dollar appreciate; if they signal rising inflationary expectations and a falling real interest rate, the dollar will depreciate. Table 12.5 provides examples of real interest rates for various nations.

TABLE 12.5**Nominal and Real Interest Rates, April 2017**

Country	Nominal Interest Rate* (percent)	Inflation Rate** (percent)	Real Interest Rate (percent)
Greece	6.7	0.8	5.9
Russia	8.1	4.5	3.6
South Africa	8.8	5.7	3.1
Indonesia	7.0	4.3	2.7
United States	2.2	2.4	-0.2
Canada	1.5	1.9	-0.4
Euro Area	0.2	1.6	-1.4
Venezuela	10.4	56.2	-45.8

*Rates are for 10-year government bonds.

**Measured by the Consumer Price Index for the latest three months.

Source: From *The Economist*, "Economic and Financial Indicators," April 22, 2017. See also International Monetary Fund, *International Financial Statistics*, and World Bank, *Data and Statistics*, available at www.data.worldbank.org.

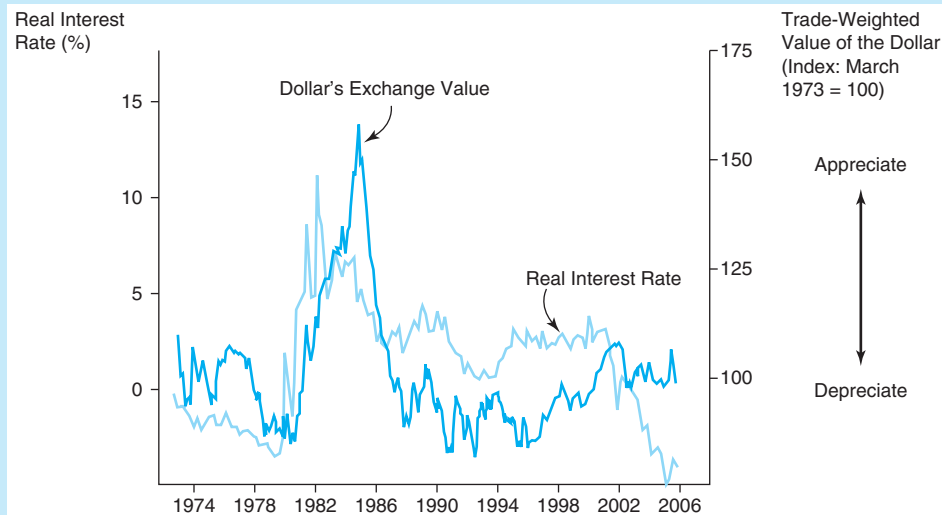
Movements in real interest rates help explain the behavior of the dollar during 1974–2006, as seen in Figure 12.5. In the late 1970s, real interest rates in the United States were at low levels, as was the trade weighted value of the dollar. By the early 1980s, U.S. real interest rates were increasing. This movement attracted investment funds to the United States that caused the dollar's exchange value to rise. After 1985, U.S. real interest rates declined and the dollar's value weakened. The positive relation between the real interest rate and the dollar's exchange rate broke down after 1995: While U.S. real interest rates remained unchanged, the dollar appreciated. This appreciation was because of a booming U.S. stock market in the late 1990s that attracted foreign investment inflows and pushed up the dollar's exchange value, even though U.S. real interest rates remained constant. Following 2002, the U.S. real interest rate declined and the dollar's exchange value depreciated at the same time, repeating the experience of the late 1980s. We expect to see appreciating currencies in countries whose real interest rates are higher than abroad because these countries will attract investment funds from all over the world. Countries that experience relatively low real interest rates tend to find their currencies depreciating.

Expected Change in the Exchange Rate

Differences in interest rates may not be all investors need to know to guide their decisions. They must also consider that the return actually realized from an investment is paid out over some future period. This time frame means that the realized value of that future payment can be altered by changes in the exchange rate itself over the term of the investment. Investors must think about possible gains or losses on foreign currency transactions in addition to interest rates on assets.

FIGURE 12.5

Interest Rate Differentials and Exchange Rates



An increase in the U.S. real interest rate increases the expected return on dollar assets, such as Treasury bills and certificates of deposit. This encourages flows of foreign investment into the United States, thus causing the dollar's exchange value to appreciate. Conversely, a decrease in the U.S. real interest rate reduces the expected profitability on dollar assets, which promotes a depreciation of the dollar's exchange value.

Expectations about the future path of the exchange rate itself will figure prominently in the investor's calculation of what he or she will actually earn from a foreign investment denominated in another currency. Even a high interest rate would not be attractive if one expects the denominating currency to depreciate at a similar or greater rate and erase all economic gain. Conversely, if the denominating currency is expected to appreciate, the realized gain would be greater than what the interest rate alone would suggest, and the asset appears more lucrative.

Suppose that U.K. investors expect the dollar to appreciate against the pound during the next three months, from \$1.50 per pound to \$1.45 per pound. Given today's exchange rate of \$1.50 per pound, the investors could spend 100,000 pounds and buy \$150,000 used to purchase U.S. Treasury bills of this value. When the bills mature in three months, the investors could cash out the bills and receive \$150,000 (plus the interest on the bills), convert these dollars into pounds at the exchange rate of \$1.45 per pound, receive 103,448 pounds ($\$150,000 \div \$1.45/\text{pound} = 103,448$ pounds), and realize a gain of 3,448 pounds. The gain on the bills would be greater than what the interest rate alone would suggest, making the bills appear more lucrative. This would enhance the incentive of U.K. investors to invest in the United States.

Figure 12.4(b) illustrates the effects of investor expectations of changes in exchange rates over the term of an investment. Assume that the equilibrium exchange rate is initially \$1.50 per pound. Suppose that U.K. investors expect that in three months the exchange value of the dollar will appreciate against the pound. By investing in three-month U.S. Treasury bills, U.K. investors can anticipate a foreign currency gain: today, selling pounds for dollars when dollars are relatively cheap and, in three months, purchasing pounds with dollars when dollars are more valuable (pounds are cheap). The expectation of foreign

currency gain will make U.S. Treasury bills seem more attractive, and the U.K. investors will purchase more of them. In the figure, the supply of pounds in the foreign exchange market shifts rightward from S_0 to S_1 and the dollar appreciates to \$1.45 per pound today. In this way, future expectations of an appreciation of the dollar can be self-fulfilling for today's value of the dollar.

Referring to the previous example, U.K. investors expect that the dollar will appreciate against the pound in three months. What triggers these expectations? The answer lies in the long-run determinants of exchange rates discussed earlier in this chapter. The dollar will be expected to appreciate if there are expectations that the U.S. price level will decrease relative to the U.K. price level, U.S. productivity will increase relative to U.K. productivity, U.S. tariffs will increase, the U.S. demand for imports will decrease, or the U.K. demand for U.S. exports will increase. Given anticipated gains resulting from an appreciating dollar, U.K. investment will flow to the United States causing an increase in today's value of the dollar in terms of the pound, as shown in the following flowchart:



Any long-run factor that causes the expected future value of the dollar to appreciate will cause the dollar to appreciate today.

Diversification, Safe Havens, and Investment Flows

Although relative levels of interest rates between countries and expected changes in exchange rates tend to be strong forces directing investment flows among economies, other factors can also affect these flows. The size of the stock of assets denominated in a particular currency in investor portfolios can induce a change in investor preferences. Why? Investors know that it is prudent to have an appropriate degree of *diversification* across asset types, including the currencies in which they are denominated. Even though dollar-denominated Treasury securities may provide a high relative return, if the accumulation has been large, at some point foreign investors, considering both risk and reward, will decide that their portfolio's share of U.S. securities is large enough. To improve the diversity of their portfolios, investors will slow or halt their purchases of U.S. securities.

INTERNATIONAL FINANCE APPLICATION

International Comparisons of GDP: Purchasing Power Parity

When economists calculate a country's gross domestic product (GDP), they add up the market values of the goods and services its economy produces and get a total—in dollars for the United States and Yuan for China. To compare countries' GDPs, there are two methods to convert each country's output into dollars.



The simplest way to do this is to use market exchange rates. In 2015, China produced about 72.1 trillion Yuan of goods and services. Using the market exchange rate of 6.5 Yuan to the dollar, China's GDP equaled \$11.1 trillion (72.1 trillion Yuan/6.5 Yuan per dollar = \$11.1 trillion). However, that number is too low. For one

(continued)

thing, many goods in developing economies such as China are much cheaper than they are in countries like the United States. China has held its Yuan at a rate to keep it less expensive than the dollar. As a result, it is cheaper to produce goods in China, which also makes consumer items cheaper to buy. Therefore, it is not fair to compare China's output in dollar terms without taking its cheaper currency into account.

One problem with simply using market exchange rates to convert China's GDP into dollars is that not all goods and services are bought and sold in a world market. Haircuts and plumbing services do not get exchanged across countries. If all goods and services were traded in world markets without any frictions, such as tariffs or transport costs, prices would be the same everywhere after correcting for the exchange rate. In practice, many goods and services are not traded. As a result, using market exchange rates to convert China's GDP from Yuan into dollars can give a misleading result: Exchange rates *overstate* the size of economies with relatively high-price levels and *understate* the size of economies with relatively low-price levels.

Exchange rates are often subject to sizable fluctuations. This fluctuation means that countries may appear to become suddenly "richer" or "poorer" even though in

reality there has been little or no change in the relative volume of goods and services produced. Purchasing power parity addresses these problems by taking into account the relative cost of living and the inflation rates of different countries, rather than just a comparison of GDPs based on market exchange rates. Therefore, GDPs of countries converted into a common currency using purchasing power parities are valued at a uniform price level and thus reflect only differences in the volumes of goods and services produced in countries.

Today, organizations such as the World Bank, International Monetary Fund, and Central Intelligence Agency accept the purchasing-power-parity method as a more realistic method of making international comparisons of GDPs than the market exchange rate method. They present international statistics on each country's GDP relative to every other's based on purchasing power parity relative to the U.S. dollar. Referring to Table 12.6, notice that, in 2015, China had the second largest GDP in the world (\$11.1 trillion) when measured at market exchange rates; when measured at purchasing power parity, China's GDP equaled \$19.8 trillion.

Source: Organization for Economic Cooperation and Development, "International Comparisons of GDP," *PPP Methodological Manual*, Paris, France, June 30, 2005, Chapter 1.

TABLE 12.6**Comparing GDPs Internationally, 2015 (Trillions of Dollars)**

Country	GDP Based on Market Exchange Rates	Country	GDP Based on Purchasing Power Parity
United States	\$18.0	China	\$19.8
China	11.1	United States	18.0
Japan	4.4	India	8.0
Germany	3.4	Japan	5.2
United Kingdom	2.9	Germany	3.9
India	2.1	Russia	3.7
Brazil	1.8	Brazil	3.2
Russia	1.4	United Kingdom	2.7

Source: World Bank, *Data and Statistics*, at www.data.worldbank.org/. See also Central Intelligence Agency, *CIA World Factbook*, and International Monetary Fund, *World Economic Outlook Database*. www.BillionPhotos.com/Shutterstock.com.

There is also likely to be a significant *safe haven* effect behind some investment flows. Some investors may be willing to sacrifice a significant amount of return if an economy offers them an especially low-risk repository for their funds. In recent decades, the United States, with a long history of stable government, steady economic growth, and large and efficient financial markets, could be expected to draw foreign investment for this reason.

Since the launch of the euro in the early 2000s, there have been concerns about profligacy of the members of the European Monetary Union. The main worry was that free-spending countries like Italy might spend and borrow excessively and pass the costs of the bill for a bailout to their frugal brethren such as Germany. By 2010, Greece was on the verge of default, and other countries like Portugal, Spain, Ireland, and Italy faced serious fiscal imbalances. Increasingly, investors became nervous about the stability of the eurozone. As a result, they sold large amounts of euros and purchased U.S. dollars, which resulted in a sizable depreciation of the euro against the dollar. The investors apparently viewed the U.S. economy to be a safe haven in terms of economic stability relative to that of the eurozone economies.

In this chapter, we have learned about the determinants of exchange rates. To see how these determinants play out on a daily basis, refer to *Currency Trading*, found in the *Money and Investing* section (section C) of *The Wall Street Journal*. You will learn about trends in currency exchange values and the factors contributing to currency depreciation and appreciation. It is a great way to apply to the real world what you have learned in this chapter.

Exchange Rate Overshooting

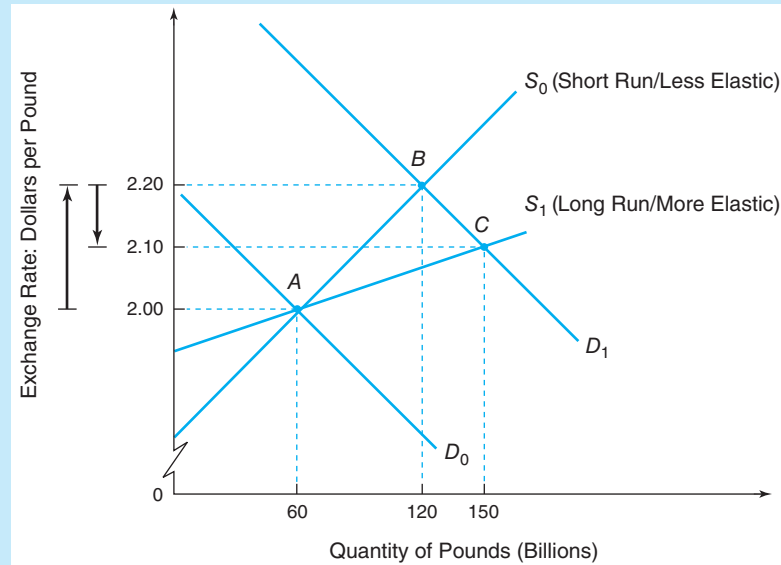
Changes in expected future values of market fundamentals contribute to exchange rate volatility in the short run. Announcements by the Federal Reserve of changes in monetary growth targets or by the president and Congress of changes in tax or spending programs cause changes in expectations of future exchange rates that can lead to immediate changes in equilibrium exchange rates. In this manner, frequent changes in policy contribute to volatile exchange rates in a system of market-determined exchange rates.

The volatility of exchange rates is further intensified by the phenomenon of **overshooting**. An exchange rate is said to overshoot when its short-run response (depreciation or appreciation) to a change in market fundamentals is *greater* than its long-run response. Changes in market fundamentals thus exert a disproportionately large *short-run* impact on exchange rates. Exchange rate overshooting is an important phenomenon because it helps explain why exchange rates depreciate or appreciate so sharply from day to day.

Exchange rate overshooting can be explained by the tendency of elasticities to be smaller in the short run than in the long run. Referring to Figure 12.6, the short-run supply schedule and demand schedule of the U.K. pound are denoted by S_0 and D_0 , respectively, and the equilibrium exchange rate is \$2 per pound. If the demand for pounds increases to D_1 , the dollar depreciates to \$2.20 per pound in the short run. However, because of the dollar depreciation, the U.K. price of U.S. exports decreases, the quantity of U.S. exports demanded increases, and thus the quantity of pounds supplied increases. The longer the time period, the greater the rise in the quantity of exports is likely to be, and the greater the rise in the quantity of pounds supplied. The long-run supply schedule of pounds is thus more elastic than the short-run supply schedule, as shown by S_1 in the figure. Following the increase in the demand for pounds to D_1 , the long-run equilibrium exchange rate is \$2.10 per pound, as compared to the short-run equilibrium exchange rate of \$2.20 per pound. Because of differences in these elasticities, the dollar's depreciation in the short run overshoots its long-run depreciation.

FIGURE 12.6

Short-Run/Long-Run Equilibrium Exchange Rates: Overshooting



Given the short-run supply of pounds (S_0), if the demand for pounds increases from D_0 to D_1 , then the dollar depreciates from \$2 per pound to a short-run equilibrium of \$2.20 per pound. In the long run, the supply of pounds is more elastic (S_1), and the equilibrium exchange rate is lower, at \$2.10 per pound. Because of the difference in these elasticities, the short-run depreciation of the dollar overshoots its long-run depreciation.

Overshooting can also be explained by the fact that exchange rates tend to be more flexible than many other prices. Many prices are written into long-term contracts (workers' wages) and do not respond immediately to changes in market fundamentals. Exchange rates tend to be highly sensitive to current demand and supply conditions. Exchange rates often depreciate or appreciate more in the short run than in the long run so as to compensate for other prices that are slower to adjust to their long-run equilibrium levels. As the general price level slowly gravitates to its new equilibrium level, the amount of exchange rate overshooting dissipates, and the exchange rate moves toward its long-run equilibrium level.

Forecasting Foreign Exchange Rates

Previous sections of this chapter have examined various factors that determine exchange rate movements. Even a clear understanding of how factors influence exchange rates does not guarantee that we can forecast how exchange rates will change. Not only do exchange rate determinants often point in the opposite direction, but predicting how these determinants will change is also difficult. Forecasting exchange rates is tricky, especially in the short run.

Nevertheless, exchange rate forecasts are necessary for exporters, importers, investors, bankers, and foreign exchange dealers. Corporations often have, for brief periods, large amounts of cash used to make bank deposits in various currencies. Choosing a currency in which to make deposits requires some idea of what the currency's exchange rate will be in

the future. Long-term corporate planning, especially concerning decisions about foreign investment, necessitates an awareness of where exchange rates will move over an extended time period—hence the need for long-term forecasts. For multinational enterprises, short-term forecasting tends to be more widespread than long-term forecasting. Most corporations revise their currency forecasts at least every quarter.

The need of business and investors for exchange rate forecasts has resulted in the emergence of consulting firms, including Global Insights and Goldman Sachs. In addition, large banks such as JPMorgan Chase and Bank of America provide free currency forecasts to corporate clients. Customers of consulting firms often pay fees ranging up to \$100,000 per year or more for expert opinions. Consulting firms provide forecast services ranging from video screens to “listening post” interviews with forecast service employees who provide their predictions of exchange rate movements and respond to specific questions from the client.

Most exchange rate forecasting methods use accepted economic relations to formulate a model that is then refined through statistical analysis of past data. The forecasts generated by the models are usually tempered by the additional insights or reasoning of the forecaster before being offered to the final user.

In the current system of market-determined exchange rates, currency values fluctuate almost instantaneously in response to new information regarding changes in interest rates, inflation rates, money supplies, trade balances, and the like. To successfully forecast exchange rate movements, it is necessary to estimate the future values of these economic variables and determine the relation between them and future exchange rates. However, even the most sophisticated analysis can be rendered worthless by unexpected changes in government policy, market psychology, and so forth. Indeed, people who deal in the currency markets on a daily basis have come to feel that market psychology is a dominant influence on future exchange rates.

Despite these problems, exchange rate forecasters are currently in demand. Their forecasting approaches are classified as judgmental, technical, or fundamental. A Citigroup Inc. survey of about 3,000 foreign exchange traders in 2010 found that 53 percent of traders employ a combination of fundamental and technical strategies, 36 percent use a technical strategy, and only 11 percent use a strictly fundamental strategy tempered by judgmental analysis.⁴ Table 12.7 provides examples of exchange rate forecasting organizations and their methods.

Judgmental Forecasts

Judgmental forecasts are sometimes known as *subjective* or *common sense models*. They require the gathering of a wide array of political and economic data and the interpretation of these data in terms of the timing, direction, and magnitude of exchange rate changes. Judgmental forecasters formulate projections based on a thorough examination of individual nations. They consider economic indicators, such as inflation rates and trade data; political factors, such as a future national election; technical factors, such as potential intervention by a central bank in the foreign exchange market; and psychological factors that relate to one’s “feel for the market.”

Technical Forecasts

Technical analysis involves the use of historical exchange rate data to estimate future values. This approach is technical in that it extrapolates from past exchange rate trends and then projects them into the future to generate forecasts, while ignoring economic and

⁴CitiFx Pro, *Survey of Forex Traders*, New York, November 2010.

TABLE 12.7**Exchange Rate Forecasters**

Forecasting Organization	Methodology	Horizon
Global Insights	Econometric	24 months
JPMorgan Chase	Judgmental	Under 12 months
	Econometric	Over 12 months
Bank of America	Econometric	Over 12 months
	Technical	Under 12 months
Goldman Sachs	Technical	Under 12 months
	Econometric	Over 12 months
UBS Global Asset Management	Judgmental	8 months
	Econometric	12 months

Source: Data collected by author.

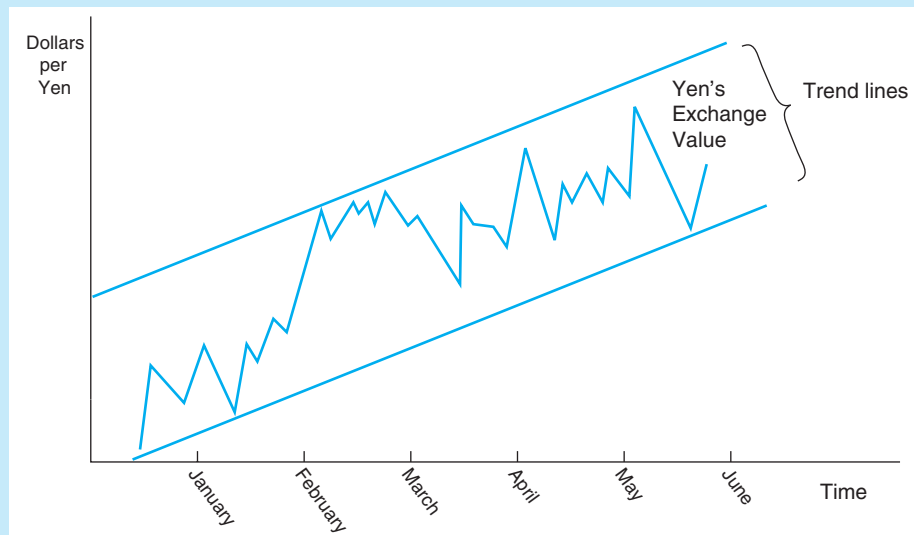
political determinants of exchange rate movements. Technical analysts look for specific exchange rate patterns. Once the beginning of a particular pattern has been determined, it automatically implies what the short-run behavior of the exchange rate will be. Therefore, the technological approach is founded on the idea that history repeats itself.

Technical analysis encompasses a variety of charting techniques involving a currency's price, cycles, or volatility. A common starting point for technical analysis is a chart that plots a trading period's opening, high, low, and closing prices. These charts most often plot one trading day's range of prices, but also are created on a weekly, monthly, and yearly basis. Traders watch for new highs and lows, broken trend lines, and patterns that are thought to predict price targets and movement.

To illustrate technical analysis, assume you have formed an opinion about the yen's exchange value against the dollar based on your analysis of economic fundamentals. Now you want to look at what the markets can tell you; you're looking for price trends and you can use charts to do it. As shown in Figure 12.7, you might want to look at the relative highs and lows of the yen for the past several months; the trend lines in the figure connect the higher highs and the lower lows for the yen. If the yen's exchange rate moves substantially above or below the trend lines, it might signal that a trend is changing. Changes in trends help you decide when to purchase or sell yen in the foreign exchange market.

Because technical analysis follows the market closely, it is used to forecast exchange rate movements in the short run. However, determining an exchange rate pattern is useful only as long as the market continues to consistently follow that pattern. However, no pattern can be relied on to continue more than a few days, or perhaps weeks. A client must therefore respond quickly to a technical recommendation to buy or sell a currency. Clients require immediate communication of technical recommendations, so as to make timely financial decisions.

Although fundamental-based models can often provide only a long-term forecast of exchange rate movements, technical analysis is the main method of analyzing shorter-term movements in an exchange rate. The results of technical analysis are used to predict the market direction of an exchange rate and to generate signals to a currency trader regarding when to buy or sell a currency. It is not surprising that most foreign exchange dealers use some technical model input to help them formulate a trading strategy for currencies, especially for intra-day and one-week horizons.

FIGURE 12.7**Technical Analysis of the Yen's Exchange Value**

When forecasting exchange rates, technical analysts watch for new highs and lows, broken trend lines, and patterns that are thought to predict price targets and movement.

INTERNATIONAL FINANCE APPLICATION**Comercial Mexicana Gets Burned by Speculation**

Although speculators like George Soros can pull huge profits out of the foreign exchange market, sometimes their currency bets backfire. Consider the case of Controladora Comercial Mexicana SAB (Comercial Mexicana), the owner of supermarkets and Costco stores in Mexico.

One day in October 2008, Comercial Mexicana was prospering as Mexico's third largest retailer and a competitor of discount giant Walmart. A few days later, the family-owned chain went bankrupt, decimated by foreign currency losses that resulted in the firm losing almost half its value. Why did this occur?

Comercial Mexicana and other Mexican firms made bad bets using currency contracts obtained from big banks such as JPMorgan Chase & Co, that were linked to the dollar/peso exchange rate. Their bets were based on



expectations of a stronger peso. However, the world credit crisis of 2008 threw the peso into a tailspin. Mexico's central bank, seeing the risk to its economy, sold billions of dollars from its reserves to purchase the weakening peso and thus prop up its value. The central bank burned through about 13 percent of its international currency reserves in this strategy, which turned out to be futile:

Mexico's peso plummeted 24 percent in October of 2008 as risk-averse investors yanked money from the country.

Under the currency deal, JPMorgan Chase & Co. offered Comercial Mexicana financing and currency trades at favorable rates. But there was a hitch. If the dollar strengthened (the peso depreciated) beyond a certain threshold, then the firm would have to sell dollars at a loss. In some cases, the contracts had triggers that doubled the number of dollars the firm sold.

(continued)

When Comercial Mexicana purchased the currency contracts, the deals were initially profitable. But soon things deteriorated as investors panicked over the global financial crisis and began pulling money out of Mexico. As the peso depreciated, Comercial Mexicana encountered losses of \$1.4 billion. Being unable to pay its debt, the firm filed for bankruptcy.

Rather than sticking to its business of selling tomatoes and digital cameras to Mexican shoppers, Comercial Mexicana tried to make money on the dollar/peso exchange

rate. However, the firm was unprepared for the destabilizing effects of the global financial crisis of 2008.

What do you think? Are you willing to take the risk to become a currency speculator?

Sources: William Freebairn, “Comercial Mexicana Drops 44 Percent after Saying Debt Rose,” Bloomberg.com, October 24, 2008; “Big Currency Bets Backfire,” *The Wall Street Journal*, October 22, 2008, p. A1; “Comercial Mexicana Crisis in 2008,” *Explorado Mexico* at www.explorado-mexico.com/about-mexico/6/331/; Carlos Omar Trejo-Pech, Susan White, and Magdy Noguera, *Financial Distress at Comercial Mexicana, 2008–2011*, Robert H. Smith School of Business, University of Maryland, 2011.

Fundamental Analysis

Fundamental analysis is the opposite of technical analysis. It involves consideration of economic variables that are likely to affect the supply and demand of a currency and its exchange value. Fundamental analysis uses computer-based econometric models that are statistical estimations of economic theories. To generate forecasts, econometricians develop models for individual nations that attempt to incorporate the fundamental variables that underlie exchange rate movements: interest rates, balance of trade, productivity, inflation rates, and the like. If you take an econometric course at your university, you might consider preparing an exchange rate forecast as your class project. *Exploring Further 12.1* gives you an idea of the types of variables you might include in your econometric model. It can be found in MindTap.

However, econometric models used to forecast exchange rates face limitations. They often rely on predictions of key economic variables, such as inflation rates or interest rates, and obtaining reliable information can be difficult. Moreover, there are always factors affecting exchange rates that cannot easily be quantified (such as intervention by a country’s central bank in currency markets). Also, the precise timing of a factor’s effect on a currency’s exchange rate may be unclear. Inflation rate changes may not have their full impact on a currency’s value until three or six months in the future. Econometric models are best suited for forecasting long-run trends in the movement of an exchange rate. However, they do not generally provide foreign currency traders precise price information regarding when to purchase or sell a particular currency. Thus, currency traders generally prefer technical analysis to fundamental analysis when forming a trading strategy. Despite the appeal of technical analysis, most forecasters tend to use a combination of fundamental, technical, and judgmental analysis, with the emphasis on each shifting as conditions change. They form a general view about whether a particular currency is over- or undervalued in a longer-term sense. Within that framework, they assess all current economic forecasts, news events, political developments, statistical releases, rumors, and changes in sentiment, while also carefully studying the charts and technical analysis.

Exchange Rate Misalignment

In this chapter, we have learned about the factors that can cause exchange rates to move toward their underlying fundamental, or equilibrium, values. However, many economists believe that exchange rates can deviate from their fundamental values. This is known as **exchange rate misalignment**. More specifically, when the actual exchange rate is too low,

the currency is said to be *undervalued*; when the actual exchange rate is too high, the currency is said to be *overvalued*.

Exchange rate undervaluation or overvaluation has implications for a country's trade position and job creation. For example, if the yuan is undervalued, China's exports become cheaper to Americans and U.S. exports to China become more expensive. Therefore, China gains a trade advantage at the expense of the United States. This can result in higher production of exports and import-competing goods for China, which helps foster export-led growth and job creation in China's export sector. For this reason, some economists consider efforts to increase exports through an undervalued exchange rate as unfair to other countries and a type of "beggar thy neighbor" policy.

However, it is difficult to determine what the fundamental or equilibrium value of an exchange rate is and whether a currency is misaligned, let alone by how much. For example, a study by economists at the International Monetary Fund examined eight different estimates of the Yuan's supposed undervaluation during 2003–2005; they ranged from zero to almost 50 percent depending on the methods and assumptions used. Their conclusion was that there is no fail-safe method to estimate the correct value of a currency.⁵ The topic of exchange rate misalignment is further discussed in Chapter 15 of this textbook.

SUMMARY

1. In a free market, exchange rates are determined by market fundamentals and market expectations. The former includes real interest rates, consumer preferences for domestic or foreign products, productivity, investment profitability, product availability, monetary and fiscal policy, and government trade policy. Economists generally agree that the major determinants of exchange rate fluctuations are different in the long run than in the short run.
2. The determinants of long-run exchange rates differ from the determinants of short-run exchange rates. In the long run, exchange rates are determined by four key factors: relative price levels, relative productivity levels, consumer preferences for domestic or foreign goods, and trade barriers. These factors underlie trade in domestic and foreign goods and thus changes in the demand for exports and imports.
3. In the long run, a nation's currency tends to appreciate when the nation has relatively low levels of inflation, relatively high levels of productivity, relatively strong demand for its export products, and relatively high barriers to trade.
4. According to the purchasing-power-parity theory, changes in relative national price levels determine changes in exchange rates over the long run. A currency maintains its purchasing power parity if it depreciates (appreciates) by an amount equal to the excess of domestic (foreign) inflation over foreign (domestic) inflation.
5. Over short periods of time, decisions to hold domestic or foreign financial assets play a much greater role in exchange rate determination than the demand for imports and exports does. According to the asset market approach to exchange rate determination, investors consider two key factors when deciding between domestic and foreign investments: relative interest rates and expected changes in exchange rates. Changes in these factors, in turn, account for fluctuations in exchange rates that we observe in the short run.
6. Short-term interest rate differentials between any two nations are important determinants of international investment flows and short-term exchange rates. A nation that has relatively high (low) interest

⁵Steven Dunaway and Xiangming Li, "Estimating China's Equilibrium Real Exchange Rate," Working Paper, International Monetary Fund, October 2005; and Rebecca Nelson, *Current Debates over Exchange Rates: Overview and Issues for Congress*, Congressional Research Service, January 20, 2015.

rates tends to find its currency's exchange value appreciating (depreciating) in the short run.

7. In the short run, market expectations also influence exchange rate movements. Future expectations of rapid domestic economic growth, falling domestic interest rates, and high domestic inflation rates tend to cause the domestic currency to depreciate.
8. Exchange rate volatility is intensified by the phenomenon of overshooting. An exchange rate is said

to overshoot when its short-run response to a change in market fundamentals is greater than its long-run response.

9. Currency forecasters use several methods to predict future exchange rate movements: (a) judgmental forecasts, (b) technical analysis, and (c) fundamental analysis.

KEY CONCEPTS AND TERMS

Asset market approach (p. 424)
Exchange rate misalignment (p. 435)
Forecasting exchange rates (p. 422)
Fundamental analysis (p. 435)
Judgmental forecasts (p. 432)

Law of one price (p. 418)
Market expectations (p. 414)
Market fundamentals (p. 413)
Nominal interest rate (p. 424)
Overshooting (p. 430)

Purchasing-power-parity theory (p. 420)
Real interest rate (p. 425)
Technical analysis (p. 432)

STUDY QUESTIONS

1. In a free market, what factors underlie currency exchange values? Which factors best apply to long and short-run exchange rates?
2. Why are international investors especially concerned about the real interest rate as opposed to the nominal rate?
3. What predictions does the purchasing-power-parity theory make concerning the impact of domestic inflation on the home country's exchange rate? What are some limitations of the purchasing-power-parity theory?
4. If a currency becomes overvalued in the foreign exchange market, what will be the likely impact on the home country's trade balance? What if the home currency becomes undervalued?
5. Identify the factors that account for changes in a currency's value over the long run.
6. What factors underlie changes in a currency's value in the short run?
7. Explain how the following factors affect the dollar's exchange rate under a system of market-determined exchange rates: (a) a rise in the U.S. price level, with the foreign price level held constant; (b) tariffs and quotas placed on U.S. imports; (c) increased demand for U.S. exports and decreased U.S. demand for imports; (d) rising productivity in the United States relative to other countries; (e) rising real interest rates overseas, relative to U.S. rates; (f) an increase in U.S. money growth; and (g) an increase in U.S. money demand.
8. What is meant by exchange rate overshooting? Why does it occur?
9. What methods do currency forecasters use to predict future changes in exchange rates?
10. Assuming market-determined exchange rates, use supply and demand schedules for pounds to analyze the effect on the exchange rate (dollars per pound) between the U.S. dollar and the U.K. pound under each of the following circumstances:
 - a. Voter polls suggest that the U.K.'s conservative government will be replaced by radicals who pledge to nationalize all foreign-owned assets.
 - b. Both the U.K. and U.S. economies slide into recession, but the U.K. recession is less severe than the U.S. recession.
 - c. The Federal Reserve adopts a tight monetary policy that dramatically increases U.S. interest rates.
 - d. Britain's oil production in the North Sea decreases, and exports to the United States fall.
 - e. The United States unilaterally reduces tariffs on U.K. products.

- f. Britain encounters severe inflation, while price stability exists in the United States.
 - g. Fears of terrorism reduce U.S. tourism in the United Kingdom.
 - h. The British government invites U.S. firms to invest in British oil fields.
 - i. The rate of productivity growth in Britain decreases sharply.
 - j. An economic boom occurs in the United Kingdom that induces the U.K. consumers to purchase more U.S.-made autos, trucks, and computers.
 - k. Ten percent inflation occurs in both the United Kingdom and the United States.
11. Explain why you agree or disagree with each of the following statements:
- a. “A nation’s currency will depreciate if its inflation rate is less than that of its trading partners.”
 - b. “A nation whose interest rate falls more rapidly than that of other nations can expect the exchange value of its currency to depreciate.”
 - c. “A nation that experiences higher growth rates in productivity than its trading partners can expect the exchange value of its currency to appreciate.”
12. The appreciation in the dollar’s exchange value from 1980 to 1985 made U.S. products (less/more) expensive and foreign products (less/more) expensive, (decreased/increased) U.S. imports, and (decreased/increased) U.S. exports.
13. Suppose that the dollar/franc exchange rate equals \$0.50 per franc. According to the purchasing-power-parity theory, what will happen to the dollar’s exchange value under each of the following circumstances?
- a. The U.S. price level increases by 10 percent and the price level in Switzerland stays constant.
 - b. The U.S. price level increases by 10 percent and the price level in Switzerland increases by 20 percent.
 - c. The U.S. price level decreases by 10 percent and the price level in Switzerland increases by 5 percent.
 - d. The U.S. price level decreases by 10 percent and the price level in Switzerland decreases by 15 percent.
14. Suppose that the nominal interest rate on three-month Treasury bills is 8 percent in the United States and 6 percent in the United Kingdom, and the rate of inflation is 10 percent in the United States and 4 percent in the United Kingdom.
- a. What is the real interest rate in each nation?
 - b. In which direction would international investment flow in response to these real interest rates?
 - c. What impact would these investment flows have on the dollar’s exchange value?

EXPLORING FURTHER

The use of regression analysis in exchange rate forecasting is contained in *Exploring Further 12.1*, which can be found in MindTap.

CHAPTER 13

Exchange Rate Adjustments and the Balance-of-Payments



In this chapter, we examine the impact of exchange rate adjustments on the balance of trade. We will learn under what conditions currency depreciation (appreciation) will improve(worsen) a nation's trade position. It should be noted that disequilibrium in the balance of trade can also be reversed by automatic adjustments in prices, interest rates, and incomes. This is explained in the online *Exploring Further 13.1*, “Mechanisms of International Adjustment,” which can be accessed in MindTap.

Effects of Exchange Rate Changes on Costs and Prices

Industries that compete with foreign producers or rely on imported inputs in production can be noticeably affected by exchange rate fluctuations. Changing exchange rates influence the international competitiveness of a nation's industries through their influence on relative costs. How do exchange rate fluctuations affect relative costs? The answer depends on the extent to which a firm's costs are denominated in terms of the home currency or foreign currency.

Case 1: No Foreign Sourcing—All Costs Are Denominated in Dollars

Table 13.1 illustrates the hypothetical production costs of Nucor, a U.S. steel manufacturer. Assume that in its production of steel, Nucor uses U.S. labor, coal, iron, and other inputs whose costs are denominated in dollars. In period 1, the exchange value of the dollar is assumed to be \$0.50 per Swiss franc (2 francs per dollar). Assume that the firm's cost of producing a ton of steel is \$500, which is equivalent to 1,000 francs at this exchange rate.

Suppose that in period 2, because of changing market conditions, the dollar's exchange value *appreciates* from \$0.50 per franc to \$0.25 per franc, a 100 percent appreciation (the franc depreciates from 2 to 4 francs per dollar). With the dollar appreciation, Nucor's labor, iron, coal, and other input costs remain constant in dollar terms. In terms of the franc, these

TABLE 13.1**Effects of a Dollar Appreciation on a U.S. Steel Firm's Production Costs When All Costs Are Dollar Denominated****COST OF PRODUCING A TON OF STEEL**

	PERIOD 1 \$0.50 PER FRANC (2 FRANCS = \$1)		PERIOD 2 \$0.25 PER FRANC (4 FRANCS = \$1)	
	Dollar Cost	Franc Equivalent	Dollar Cost	Franc Equivalent
Labor	\$160	320 francs	\$160	640 francs
Materials (iron/coal)	300	600	300	1,200
Other costs (energy)	40	80	40	160
Total	\$500	1,000 francs	\$500	2,000 francs
Percentage change	—	—	—	100%

costs rise from 1,000 francs to 2,000 francs per ton, a 100 percent increase. The 100 percent dollar appreciation induces a 100 percent increase in Nucor's franc-denominated production cost. The international competitiveness of Nucor is thus reduced.

This example assumes that all of a firm's inputs are acquired domestically and their costs are denominated in the domestic currency. In many industries, some of a firm's inputs are purchased in foreign markets (foreign sourcing), and these input costs are denominated in a foreign currency. What impact does a change in the home currency's exchange value have on a firm's costs in this situation?

Case 2: Foreign Sourcing—Some Costs Denominated in Dollars and Some Costs Denominated in Francs

Table 13.2 again illustrates the hypothetical production costs of Nucor, whose costs of labor, iron, coal, and certain other inputs are assumed to be denominated in dollars. Suppose Nucor acquires scrap iron from Swiss suppliers (foreign sourcing) and these

TABLE 13.2**Effects of a Dollar Appreciation on a U.S. Steel Firm's Production Costs When Some Costs Are Dollar Denominated and Other Costs Are Franc Denominated****COST OF PRODUCING A TON OF STEEL**

	PERIOD 1 \$0.50 PER FRANC (2 FRANCS = \$1)		PERIOD 2 \$0.25 PER FRANC (4 FRANCS = \$1)	
	Dollar Cost	Franc Equivalent	Dollar Cost	Franc Equivalent
Labor	\$160	320 francs	\$160	640 francs
Materials				
\$ denominated (iron/coal)	120	240	120	480
Franc denominated (scrap iron)	<u>180</u>	<u>360</u>	<u>90</u>	<u>360</u>
Total	300	600	210	840
Other costs (energy)	<u>40</u>	<u>80</u>	<u>40</u>	<u>160</u>
Total cost	\$500	1,000 francs	\$410	1,640 francs
Percentage change	—	—	-18%	+64%

costs are denominated in francs. Once again, assume that the dollar's exchange value appreciates from \$0.50 per franc to \$0.25 per franc. As before, the cost in francs of Nucor's labor, iron, coal, and certain other inputs rises by 100 percent following the dollar appreciation; however, the franc cost of scrap iron remains constant. As can be seen in the table, Nucor's franc cost per ton of steel rises from 1,000 francs to 1,640 francs—an increase of only 64 percent. Thus, the dollar appreciation worsens Nucor's international competitiveness, but not as much as in the previous example.

In addition to influencing Nucor's franc-denominated cost of steel, a dollar appreciation affects a firm's dollar cost when franc-denominated inputs are involved. Because scrap iron costs are denominated in francs, they remain at 360 francs after the dollar appreciation; the dollar-equivalent scrap iron cost falls from \$180 to \$90. Because the costs of Nucor's other inputs are denominated in dollars and do not change following the dollar appreciation, the firm's total dollar cost falls from \$500 to \$410 per ton—a decrease of 18 percent. This cost reduction offsets some of the cost disadvantage that Nucor incurs relative to Swiss exporters as a result of the dollar appreciation (franc depreciation).

The preceding examples suggest the following generalization: As franc-denominated costs become a larger portion of Nucor's total costs, a dollar appreciation (depreciation) leads to a smaller increase (decrease) in the franc cost of Nucor steel and a larger decrease (increase) in the dollar cost of Nucor steel compared to the cost changes that occur when all input costs are dollar denominated. As franc-denominated costs become a smaller portion of total costs, the opposite conclusions apply. These conclusions have been especially significant for the world trading system during the 1980s to 2000s as industries—for example, autos and computers—have become increasingly internationalized and use increasing amounts of imported inputs in the production process.

Changes in relative costs because of exchange rate fluctuations also influence relative prices and the volume of goods traded among nations. By increasing U.S. production costs, a dollar *appreciation* tends to *raise* U.S. export prices in foreign currency terms that induce a decrease in the quantity of U.S. goods sold abroad; similarly, the dollar appreciation leads to an increase in U.S. imports. By decreasing U.S. production costs, dollar *depreciation* tends to *lower* U.S. export prices in foreign currency terms that induce an increase in the quantity of U.S. goods sold abroad; similarly, the dollar depreciation leads to a decrease in U.S. imports.

Several factors govern the extent by which exchange rate movements lead to relative price changes among nations. Some U.S. exporters may be able to offset the price-increasing effects of an appreciation in the dollar's exchange value by reducing profit margins to maintain competitiveness. Perceptions concerning long-term trends in exchange rates also promote price rigidity: U.S. exporters may be less willing to raise prices if the dollar's appreciation is viewed as temporary. The extent that industries implement pricing strategies depends significantly on the substitutability of their product: The greater the degree of product differentiation (as in quality or service), the greater control producers can exercise over prices; the pricing policies of such producers are somewhat insulated from exchange rate movements.

Is there any way that companies can offset the impact of currency swings on their competitiveness? Suppose the exchange value of the Japanese yen appreciates against other currencies, which causes Japanese goods to become less competitive in world markets. To insulate themselves from the squeeze on profits caused by the rising yen, Japanese companies could move production to affiliates located in countries whose currencies have depreciated against the yen. This strategy would be most likely to occur if the yen's appreciation is sizable and is regarded as being permanent. Even if the yen's appreciation is not permanent, shifting production offshore can reduce the uncertainties associated with currency swings. Japanese companies have resorted to offshore production to protect themselves from an appreciating yen.

Cost-Cutting Strategies of Manufacturers in Response to Currency Appreciation

For years manufacturers have watched with dismay as the home currency surges to new heights, making it harder for them to wring profits out of exports. This situation tests their ingenuity to become more efficient in order to remain competitive on world markets. Let us consider how Japanese and American manufacturers responded to appreciations of their home currencies.

Appreciation of the Yen: Japanese Manufacturers

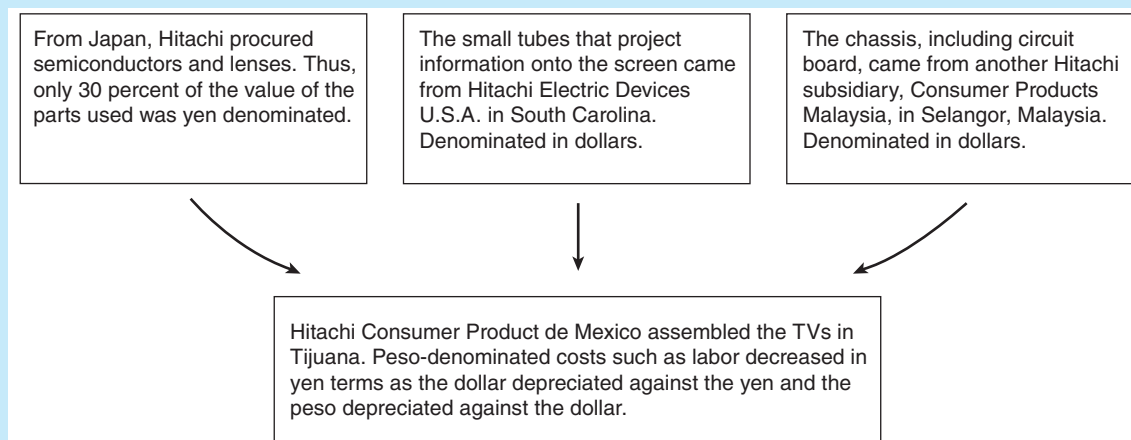
From 1990 to 1996, the value of the Japanese yen relative to the U.S. dollar increased by almost 40 percent. In other words, if the yen and dollar prices in the two nations had remained unchanged, Japanese products in 1996 would have been roughly 40 percent more expensive, compared with U.S. products, than they were in 1990. How did Japanese manufacturers respond to a development that could have had disastrous consequences for their competitiveness in world markets?

Japanese firms remained competitive by using the yen's strength to cheaply establish integrated manufacturing bases in the United States and in dollar-linked Asia. This strategy allowed Japanese firms to play both sides of the fluctuations in the yen/dollar exchange rate, using cheaper dollar-denominated parts and materials to offset higher yen-related costs. While they maintained their U.S. markets, many Japanese companies also used the strong yen to purchase cheaper components from around the world and ship them home for assembly. That action provided a competitive edge in Japan for these firms.

Consider the Japanese electronics manufacturer Hitachi whose TV sets were a global production effort in the mid-1990s, as shown in Figure 13.1. The small tubes that projected information onto Hitachi TV screens came from a subsidiary in South Carolina, while the TV chassis and circuitry were manufactured by an affiliate in Malaysia.

FIGURE 13.1

How Hitachi Coped with the Yen's Appreciation



Hitachi's global diversification permitted it to sell TVs in the United States without raising prices as the yen appreciated against the dollar.

From Japan came only computer chips and lenses that amounted to 30 percent of the value of the parts used. By sourcing TV production in countries whose currencies had fallen against the yen, Hitachi was able to hold down the dollar price of its TV sets despite the rising yen.

To limit their vulnerability to a rising yen, Japanese exporters also shifted production from commodity-type goods to high-value products. The demand for commodities—for example, metals and textiles—is quite sensitive to price changes because these goods are largely indistinguishable except by price. Customers could easily switch to non-Japanese suppliers if an increase in the yen shoved the dollar price of Japanese exports higher. In contrast, more sophisticated, high-value products—such as transportation equipment and electrical machinery—are less sensitive to price increases. For these goods, factors such as embedded advanced technology and high-quality standards work to neutralize the effect on demand if prices are driven up by an appreciating yen. Shifting production from commodity-type products to high-value products from 1990 to 1996 enhanced the competitiveness of Japanese firms.

Consider the Japanese auto industry. To offset the rising yen, Japanese automakers cut the yen prices of their autos and thus realized falling unit-profit margins. They also reduced manufacturing costs by increasing worker productivity, importing materials and parts whose prices were denominated in currencies that had depreciated against the yen, and outsourcing larger amounts of a vehicle's production to transplant factories in countries whose currencies had depreciated against the yen.

In 1994, Toyota Motor Corporation announced that its competitiveness had been eroded by as much as 20 percent as a result of the yen's appreciation. Toyota therefore convinced its subcontractors to cut part prices by 15 percent over three years. By using common parts in various vehicles and shortening the time needed to design, test, and commercialize automobiles, Toyota was also able to cut costs. Moreover, Toyota pressured Japanese steelmakers to produce less costly galvanized sheet steel for use in its vehicles. Toyota reintroduced less expensive models with fewer options in an effort to reduce costs and prices and thus recapture sales in the midsize family car segment of the market.

Foreign-made parts, once rejected by Japanese automakers as inferior to domestically produced parts, became much less alien to them in the 1990s. Foreign parts steadily made their way into Japanese autos, helped by both the strong yen and Japanese automakers' urgency to slash costs. Moreover, Japanese auto parts makers set up manufacturing operations in Southeast Asia and South America to cut costs; these parts were then exported to Japan for assembly into autos.

Appreciation of the Dollar: U.S. Manufacturers

From 1996 to 2002, U.S. manufacturers were alarmed as the dollar appreciated by 22 percent on average against the currencies of major U.S. trading partners. This appreciation resulted in U.S. manufacturers seeking ways to tap overseas markets and defend their home turf.

Consider American Feed Co., a Napoleon, Ohio, company that makes machinery used in auto plants. In 2001, the firm reached a deal with a similar manufacturing company in Spain. Both companies produce machines that car factories use to unroll giant coils of steel and feed them through presses to make parts. According to the pact, when orders come in, management of the two companies meet to decide which plant should make which parts, in essence dividing the work to keep both factories operating. As a result, American Feed can share in the benefits of having a European production base without having to take on the risks of building its own factory there. The company redesigned its machines to make them more efficient and less expensive to build. These efforts cut about 20 percent off the machines' production costs.

Sipco Molding Technologies, a Meadville, Pennsylvania, tool and die maker also had to cut costs to survive the dollar's appreciation. For years, Sipco had a partnership with an Austrian company that designed a special line of tools that Sipco once built in the United States. Because of the strong dollar, the Austrian company assumed the responsibility of designing and making the tools while Sipco simply resold them. Although these efforts helped the firm cut costs, it resulted in a loss of jobs for 30 percent of its employees.

INTERNATIONAL FINANCE APPLICATION

Japanese Firms Send Work Abroad as Rising Yen Makes Their Products Less Competitive

Facing an appreciating yen in recent years, Japanese exporters have realized that it makes their goods more costly and less competitive in foreign markets. How can they protect their profits? By moving production to the United States and other nations and decreasing the amount of money they convert from dollars to yen.

During 2010–2011, Japanese businesses ranging from automakers to electronics companies were transferring more of their manufacturing abroad, because the appreciating yen fostered a major restructuring of Japan's economy. Toyota Motor Corp. produced about 57 percent of its output abroad during this period, up from 48 percent in 2005. The world's leading auto manufacturer said it would begin producing its popular Prius at a plant near Bangkok, making it the first time its flagship hybrid would be mass produced outside Japan. Also, rival Nissan Motor Co. manufactured about 71 percent of its cars abroad in 2010–2011, compared with 66 percent in



2009. Japanese business leaders said their companies had to adapt to the rising yen by sourcing more and more products outside Japan in order to compete.

Moving production to the United States and other countries can help Japanese producers escape much of the dollar/yen problem and sell their products to foreigners. This production move contributes to the excess capacity of manufacturing plants in Japan and results in job losses for Japanese workers. A continually strong yen can promote a hollowing out of Japan's economy as some have feared.

What do you think? How can moving production to the United States help Japanese producers avoid the problem of an appreciation of the yen?

Sources: "Japan Firms Send Work Overseas," *The Wall Street Journal*, October 25, 2010, p. B1; "Japanese Firms Practice Yen Damage Control," *The Wall Street Journal*, September 26, 2003, p. A7; Mike Ramsey and Neal Boudette, "Honda Revs Up Outside Japan," *The Wall Street Journal*, December 21, 2011, p. A1.

Will Currency Depreciation Reduce a Trade Deficit? The Elasticity Approach

We have seen that currency depreciation tends to improve a nation's competitiveness by reducing its costs and prices while currency appreciation implies the opposite. Under what circumstances will currency depreciation reduce a trade deficit?

Several aspects of currency depreciation must be considered, and each of them will be dealt with in a separate section. The **elasticity approach** emphasizes the relative *price effects* of depreciation and suggests that depreciation works best when demand elasticity is high. The **absorption approach** deals with the *income effects* of depreciation; the implication is that a decrease in domestic expenditure relative to income must occur for depreciation to promote trade equilibrium. The **monetary approach** stresses the effects depreciation has on the *purchasing power of money* and the resulting impact on domestic expenditure levels. Let us begin by considering the elasticity approach.

Currency depreciation affects a country's balance of trade through changes in the relative prices of goods and services internationally. A trade deficit nation may be able to reverse its imbalance by lowering its relative prices, so that exports increase and imports decrease. The nation can lower its relative prices by permitting its exchange rate to depreciate in a free market or by formally devaluing its currency under a system of fixed exchange rates. The ultimate outcome of currency depreciation depends on the price elasticity of demand for a nation's imports and the price elasticity of demand for its exports.

Recall that *elasticity of demand* refers to the responsiveness of buyers to changes in price. Elasticity indicates the percentage change in the quantity demanded stemming from a 1 percent change in price. Mathematically, elasticity is the ratio of the percentage change in the quantity demanded to the percentage change in price. This ratio can be symbolized as follows:

$$\text{Elasticity} = (\Delta Q/Q) \div (\Delta P/P)$$

The elasticity coefficient is stated numerically without regard to the algebraic sign. If the preceding ratio exceeds 1, a given percentage change in price results in a larger percentage change in quantity demanded; this is referred to as *elastic* demand. If the ratio is less than 1, demand is said to be *inelastic* because the percentage change in quantity demanded is less than the percentage change in price. A ratio precisely equal to 1 denotes *unitary elastic* demand, meaning the percentage change in quantity demanded just matches the percentage change in price.

Next, we investigate the effects of currency depreciation on a nation's balance of trade—that is, the value of its exports minus imports. Suppose the U.K. pound depreciates by 10 percent against the dollar. Whether the U.K. trade balance will be improved depends on what happens to the dollar in payments for the United Kingdom's exports as opposed to the dollar out payments for its imports. This balance depends on whether the U.S. demand for U.K. exports is elastic or inelastic and whether the U.K. demand for imports is elastic or inelastic.

Depending on the size of the demand elasticities for U.K. exports and imports, the United Kingdom's trade balance may improve, worsen, or remain unchanged in response to the pound depreciation. The general rule that determines the actual outcome is the so-called **Marshall–Lerner condition**. The Marshall–Lerner condition states the following: (1) Depreciation will *improve* the trade balance if the currency-depreciating nation's demand elasticity for imports plus the foreign demand elasticity for the nation's exports exceeds 1.0. (2) If the sum of the demand elasticities is less than 1.0, depreciation will *worsen* the trade balance. (3) The trade balance will be *neither helped nor hurt* if the sum of the demand elasticities equals 1.0. The Marshall–Lerner condition may be stated in terms of the currency of either the nation undergoing depreciation or its trading partner. Our discussion is confined to the currency of the currency-depreciating country, the United Kingdom.

Case 1: Improved Trade Balance

Table 13.3 illustrates the effect of a depreciation of the pound on the U.K. trade balance. Referring to Table 13.3(a), assume that the U.K. demand elasticity for imports equals 2.5 and the U.S. demand elasticity for U.K. exports equals 1.5; the sum of the elasticities is 4.0. Suppose the pound depreciates by 10 percent against the dollar. An assessment of the overall impact of the depreciation on the United Kingdom's payments position requires identification of the depreciation's impact on import expenditures and export receipts.

If prices of imports remain constant in terms of foreign currency, then depreciation increases the home currency price of goods imported. Because of the depreciation, the pound price of U.K. imports rises 10 percent. U.K. consumers would be expected to reduce

TABLE 13.3**Effect of Pound Depreciation on the Trade Balance of the United Kingdom****(a) IMPROVED TRADE BALANCE**

Sector	Pound Price (%)	Quantity Demanded (%)	Net Effect (in pounds)
Import	+10	-25	-15% out payments
Export	0	+15	+15% in payments

Assumptions:

U.K. demand elasticity for imports = 2.5

Demand elasticity for U.K. exports = 1.5 Sum = 4.0

Pound depreciation = 10%

(b) WORSENE TRADE BALANCE

Sector	Change in Pound Price (%)	Change in Quantity Demanded (%)	Net Effect (in pounds)
Import	+10	-2	+8% out payments
Export	0	+1	+1% in payments

Assumptions:

U.K. demand elasticity for imports = 0.2

U.S. demand elasticity for U.K. exports = 0.1 Sum = 0.3

Pound depreciation = 10%

their purchases from abroad. Given an import demand elasticity of 2.5, the depreciation triggers a 25 percent decline in the quantity of imports demanded. The 10 percent price increase in conjunction with a 25 percent quantity reduction results in approximately a 15 percent decrease in U.K. out payments in pounds. This cutback in import purchases actually reduces import expenditures, which reduces the U.K. deficit.

How about U.K. export receipts? The pound price of the exports remains constant, but after depreciation of the pound, consumers in the United States find U.K. exports costing 10 percent less in terms of dollars. Given a U.S. demand elasticity of 1.5 for U.K. exports, the 10 percent U.K. depreciation will stimulate foreign sales by 15 percent so that export receipts in pounds will increase by approximately 15 percent. This increase strengthens the U.K. payments position. The 15 percent reduction in import expenditures coupled with a 15 percent rise in export receipts means that the pound depreciation will reduce the U.K. payments deficit. *With the sum of the elasticities exceeding 1, the depreciation strengthens the United Kingdom's trade position.*

Case 2: Worsened Trade Balance

In Table 13.3(b), the U.K. demand elasticity for imports is 0.2 and the U.S. demand elasticity for U.K. exports is 0.1; the sum of the elasticities is 0.3. The 10 percent pound depreciation raises the pound price of imports by 10 percent, inducing a 2 percent reduction in the quantity of imports demanded. In contrast to the previous case, under relatively inelastic conditions, the depreciation contributes to an *increase*, rather than a decrease, in import expenditures of 8 percent. As before, the pound price of U.K. exports is unaffected by the depreciation, whereas the dollar price of exports falls 10 percent. American purchases from abroad increase by 1 percent, resulting in an increase in pound receipts of

about 1 percent. With expenditures on imports rising 8 percent while export receipts increase only 1 percent, the U.K. deficit will tend to *worsen*. As stated in the Marshall–Lerner condition, *if the sum of the elasticities is less than 1.0, currency depreciation will cause deterioration in a nation’s trade position*. The reader is left to verify that a nation’s trade balance remains unaffected by depreciation if the sum of the demand elasticities equals 1.0.

Although the Marshall–Lerner condition provides a general rule as to when currency depreciation will be successful in restoring payments equilibrium, it depends on some simplifying assumptions. For one, it is assumed that a nation’s trade balance is in equilibrium when the depreciation occurs. If there is initially a large trade deficit with imports exceeding exports, then a depreciation might cause import expenditures to change more than export receipts, even though the sum of the demand elasticities exceeds 1.0. The analysis also assumes no change in the sellers’ prices in their own currency. This may not always be true. To protect their competitive position, foreign sellers may lower their prices in response to a depreciation of the home country’s currency; domestic sellers may raise home currency prices so the depreciation effects are not fully transmitted into lower foreign exchange prices for their goods. Neither of these assumptions invalidates the Marshall–Lerner condition’s spirit that suggests currency depreciations work best when demand elasticities are high.

The Marshall–Lerner condition illustrates the price effects of currency depreciation on the home country’s trade balance. The extent that price changes affect the volume of goods traded depends on the elasticity of demand for imports and exports. If the elasticities were known in advance, it would be possible to determine the proper exchange rate policy to restore payments equilibrium. Table 13.4 shows estimated price elasticities of demand for total imports and exports by country.

TABLE 13.4

Long-Run Price Elasticities of Demand for Total Imports and Exports of Selected Countries

Country	Import Price Elasticity	Export Price Elasticity	Sum of Import and Export Elasticities
Canada	0.9	0.9	1.8
France	0.4	0.2	0.6
Germany	0.1	0.3	0.4
Italy	0.4	0.9	1.3
Japan	0.3	0.1	0.4
United Kingdom	0.6	1.6	2.2
United States	0.3	1.5	1.8

Source: From Peter Hooper, Karen Johnson, and Jaime Marquez, “Trade Elasticities for the G-7 Countries,” *Princeton Studies in International Economics*, No. 87, August 2000, p. 9.

J-Curve Effect: Time Path of Depreciation

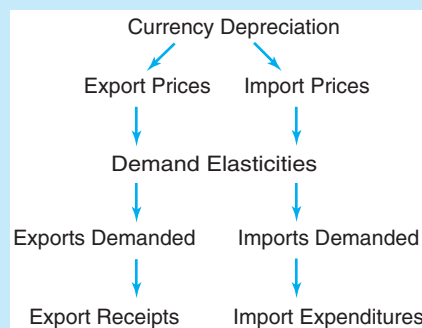
Empirical estimates of price elasticities in international trade suggest that according to the Marshall–Lerner condition, currency depreciation will often improve a nation’s trade balance. However, a problem in measuring world price elasticities is that there tends to be a *time lag* between changes in exchange rates and their ultimate effect on real trade. One popular description of the time path of trade flows is the so-called **J-curve effect**. This view suggests that in the short run, currency depreciation will lead to a worsening of a nation’s

trade balance. As time passes, the trade balance will likely improve. This is because it takes time for new information about the price effects of depreciation to be disseminated throughout the economy and for economic units to adjust their behavior accordingly.

Currency depreciation affects a nation's trade balance through its net impact on export receipts and import expenditures. Export receipts and import expenditures are calculated by multiplying the commodity's per-unit price by the quantity being demanded. Figure 13.2 illustrates the process by which depreciation influences export receipts and import expenditures.

The immediate effect of depreciation is a change in relative prices. If a nation's currency depreciates by 10 percent, it means that import prices initially increase 10 percent in terms of the home currency. The quantity of imports demanded will then fall according to home demand elasticities. At the same time, exporters will initially receive 10 percent more in home currency for each unit of foreign currency they earn. This means they can become more competitive and lower their export prices measured in terms of foreign currencies. Export sales will then rise in accordance with foreign demand elasticities. The problem with this process is that for depreciation to take effect, time is required for the pricing mechanism to induce changes in the volume of exports and imports.

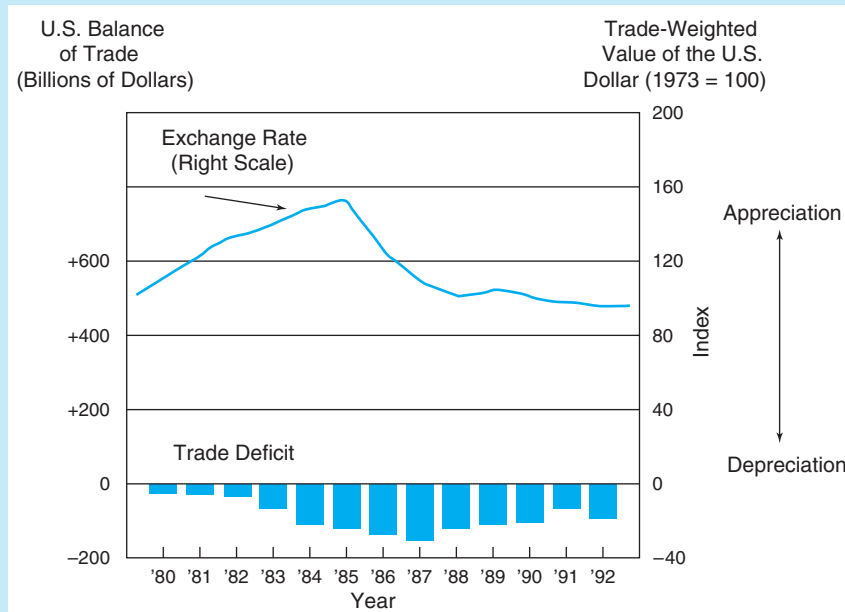
The time path of the response of trade flows to a currency's depreciation can be described in terms of the J-curve effect, so called because the trade balance continues to get worse for a while after depreciation (sliding down the hook of the J) and then gets better (moving up the stem of the J). This effect occurs because the initial effect of depreciation is an increase in import expenditures: The home currency price of imports has risen, but the volume is unchanged owing to prior commitments. As time passes, the quantity adjustment effect becomes relevant: Import volume is depressed, whereas exports become more attractive to foreign buyers.

FIGURE 13.2**Depreciation Flowchart**

Advocates of the J-curve effect cite the experience of the U.S. balance of trade during the 1980s and 1990s. As seen in Figure 13.3, between 1980 and 1987, the U.S. trade deficit expanded at a rapid rate. The deficit decreased substantially between 1988 and 1991. The rapid increase in the trade deficit that took place during the early 1980s occurred mainly because the appreciation of the dollar at the time resulted in a steady increase in imports and a drop in U.S. exports. The depreciation of the dollar that began in 1985 led to a boom in exports in 1988 and a drop in the trade deficit through 1991.

FIGURE 13.3

Time Path of U.S. Balance of Trade in Billions of Dollars, in Response to Dollar Appreciation and Depreciation



Between 1980 and 1987, the U.S. merchandise trade deficit expanded at a rapid rate. The trade deficit decreased substantially between 1988 and 1991. The rapid increase in the trade deficit that took place during the early 1980s occurred mainly because of the appreciation of the dollar at the time, which resulted in a steady increase in imports and a drop in U.S. exports. The depreciation of the dollar that began in 1985 led to a boom in exports in 1988 and a drop in the trade deficit through 1991.

What factors might explain the time lags in a currency depreciation adjustment process? The types of lags that may occur between changes in relative prices and the quantities of goods traded include the following:

- *Recognition lags* of changing competitive conditions
- *Decision lags* in forming new business connections and placing new orders
- *Delivery lags* between the time new orders are placed and when their impact on trade and payment flows is felt
- *Replacement lags* in using up inventories and wearing out existing machinery before placing new orders
- *Production lags* involved in increasing the output of commodities for which demand has increased

Empirical evidence suggests that the trade balance effects of currency depreciation do not materialize until years afterward. Adjustment lags may be four years or more, although the major portion of adjustment takes place in about two years.¹

¹Helen Junz and Rudolf R. Rhomberg, "Price Competitiveness in Export Trade among Industrial Countries," *American Economic Review*, May 1973, pp. 412–419.

Exchange Rate Pass-Through

The J-curve analysis assumes that a given change in the exchange rate brings about a proportionate change in import prices. In practice, this relation may be less than proportionate, weakening the influence of a change in the exchange rate on the volume of trade.

The extent to which changing currency values lead to changes in import and export prices is known as **exchange rate pass-through**. Pass-through is important because buyers have incentives to alter their purchases of foreign goods only to the extent that the prices of these goods change in terms of their domestic currency following a change in the exchange rate. This change depends in part on the willingness of exporters to permit the change in the exchange rate to affect the prices they charge for their goods measured in terms of the buyer's currency.

Assume that Toyota of Japan exports autos to the United States and the prices of Toyota are fixed in terms of the yen. Suppose the dollar's value depreciates 10 percent relative to the yen. Assuming no offsetting actions by Toyota, U.S. import prices will rise 10 percent because 10 percent more dollars are needed to purchase the yen than are used to pay for the import purchases. Complete pass-through thus exists: Import prices in dollars rise by the full proportion of the dollar depreciation.

To illustrate the calculation of complete currency pass-through, assume that Caterpillar charges \$50,000 for a tractor exported to Japan. If the exchange rate is 150 yen per U.S. dollar, the price paid by the Japanese buyer will be 7,500,000 yen. Assuming that the dollar price of the tractor remains constant, a 10 percent appreciation in the dollar's exchange value will increase the tractor's yen price 10 percent, to 8,250,000 yen ($165 \times 50,000 = 8,250,000$). Conversely, if the dollar depreciates by 10 percent, the yen price of the tractor will fall by 10 percent, to 6,750,000 yen. As long as Caterpillar keeps the dollar price of its tractor constant, changes in the dollar's exchange rate will be fully reflected in changes in the foreign currency price of exports. The ratio of changes in the foreign currency price to changes in the exchange rate will be 100 percent, implying complete currency pass-through.

Partial Exchange Rate Pass-Through

Although complete exchange rate pass-through is a possibility, in practice the relation tends to be partial. Table 13.5 presents estimates of average exchange rate pass-through rates for the United States and other advanced countries over the 1975–2003 period. The exchange rate pass-through for the United States over this period was 0.42. This rate means that a 1 percent change in the dollar's exchange rate produced a 0.42 percent change in U.S. import prices. Because the percentage change in import prices was less than the percentage change in the exchange rate, exchange rate pass-through was “partial” for the United States. Similar conclusions apply to other countries included in the table. When exchange rate pass-through is partial at home and abroad, the effect of changes in the exchange rate on trade volume is lessened, as it forestalls movement in relative trade prices.

Why does exchange rate pass-through tend to be partial? The answer appears to lie in invoicing practices, market share considerations, and distribution costs.²

Invoice Practices Businesses involved in international trade can select the currency they want to use to express the price of their exports. They can invoice their exports in their own home currency or in the currency of their customers. Evidence on import and export invoicing in recent years reveals that the dollar is the dominant currency of invoicing across

²This section is drawn from Linda Goldberg and Eleanor Wiske Dillon, “Why a Dollar Depreciation May Not Close the U.S. Trade Deficit,” *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, June 2007.

TABLE 13.5**Exchange Rate Pass-Through into Import Prices after One Year**

Country	Pass-Through Rate (For every 1 percent a currency depreciates/ appreciates the price of imports for the country increases/decreases by)*
OECD** average	0.64%
United States	0.42
Euro area	0.81
Japan	0.57–1.0
Other advanced countries	0.60

*Estimates are based on data from 1973 to 2003.

**The Organization for Economic Cooperation and Development consists of Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Republic of Korea, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

Sources: Jose Campa and Linda Goldberg, “Exchange Rate Pass-Through into Import Prices,” *Review of Economics and Statistics*, November 2005, pp. 984–985; and Hamid Faruquee, “Exchange Rate Pass-Through in the Euro Area,” *IMF Staff Papers*, April 2006, pp. 63–88.

non-European countries, as shown in Table 13.6. For example, 93 percent of U.S. imports and 99 percent of U.S. exports were priced in dollars during the first decade of the 2000s.

The dominant use of dollars in invoicing U.S. trade helps explain the partial pass-through of changes in the dollar’s exchange rate to U.S. import prices. When foreign producers invoice their exports to the United States in dollars, the price of these goods remains fixed in terms of the dollar if the dollar depreciates against other currencies. The exchange rate movements affect only the foreign producers’ profits and will not increase the dollar price paid by U.S. importers. After a time, foreign producers may choose to adjust their prices in response to the exchange rate.

TABLE 13.6**Use of the U.S. Dollar in Export and Import Invoicing, 2002–2004**

Country	Dollar Share in Export Financing	Dollar Share in Import Financing	U.S. Share in Exports
United States	99.8%	92.8%	—
Japan	48.0	68.7	24.8
South Korea	83.2	79.6	17.0
Malaysia	90.0	90.0	20.5
Thailand	84.4	76.0	17.0
Australia	69.6	50.5	8.1
United Kingdom	26.0	37.0	15.5
Euro area	30.4	38.0	14.2
EU Accession countries*	17.5	23.9	3.2

*Bulgaria, Czech Republic, Estonia, Hungary, and Poland.

Sources: Linda Goldberg and Cedric Tille, “The International Role of the Dollar and Trade Balance Adjustment.” *The Group of Thirty Occasional Paper No. 71*, 2006; and Annette Kamps, “The Determinants of Currency Invoicing in International Trade,” *European Central Bank Working Paper No. 665*, August 2006.

Market Share Considerations Another factor that contributes to partial exchange rate pass-through for a period following a dollar depreciation is the desire of foreign producers to preserve market share for goods sold in the United States. In practice, many goods and services are produced in imperfectly competitive markets. In terms of prices for these goods, firms are able to make a profit margin over costs. Firms may choose not to pass on the full change in costs brought about by changing exchange rates and instead elect to change their profit margins, thus reducing the sensitivity of consumer prices to the exchange rate. Exporters to the United States may accept a lower profit margin when their currency appreciates in order to keep their dollar prices constant against American competitors. This is especially pertinent for the United States, which has a large market and where imports command a lower share of consumption than they do in smaller markets. Because American consumers can generally substitute domestic goods for imports, foreign exporters are reluctant to pass all of the exchange rate movement into prices because of fear of losing market share. Relatively strong domestic competition for imported goods in the United States tends to lessen the extent of exchange rate pass-through into import prices.

Kellwood Co., a major U.S. marketer of garments such as Calvin Klein, noted that some of its Asian suppliers such as sewing factories and fabric mills inquired about increasing their prices as the dollar depreciated against their currencies in the first decade of the 2000s. These suppliers knew that if they increased their prices, Kellwood could purchase inputs from other competing suppliers. To maintain Kellwood as a customer, these suppliers cut their profit margins and refrained from raising their prices, allowing Kellwood's prices on Calvin Klein garments to remain unchanged.

Distribution Costs Thus far we have considered the transmission of exchange rates into the prices of imports arriving at a country's borders. However, other costs occur between the time a good arrives at the border and the time it is sold to the consumer. These are the distribution costs of the imported good to the final consumer, which include transportation, marketing, wholesaling, and retailing costs. In 1996, a Barbie doll shipped from China to the United States cost \$2, and it sold for \$10. The manufacturer, Mattel, earned about \$1 profit on this doll. The remaining \$7 represented payments for transportation in the United States and other marketing and distribution costs. For the United States, distribution costs average about 40 percent of overall U.S. consumer prices.³ Because domestic distribution services are not traded internationally, their costs are not affected by fluctuations in the dollar's exchange rate. As distribution costs become a large percentage of the consumer price, the sensitivity of the consumer price to exchange rate fluctuations is reduced. The effects of exchange rate pass-through are more fully discussed in *Exploring Further 13.2*, which can be found in MindTap.

INTERNATIONAL FINANCE APPLICATION

Does Currency Depreciation Stimulate Exports?

In response to the Great Recession of 2007–2009, central bankers of various nations adopted expansionary monetary policies to revive their sluggish economies. In theory, these policies reduce interest rates and increase domestic investment and consumption spending, thus stimulating output and employment. Also,



when interest rates decline, investors will pull their money out of the country in search of higher yields elsewhere, thus causing the country's currency to depreciate. Therefore, the prices of the country's exports decline, which results in rising exports to other nations, which boosts economic growth.

(continued)

³Sidney S. Alexander, "Effects of a Devaluation on a Trade Balance," *IMF Staff Papers*, April 1952, pp. 263–278.

However, in the years following the Great Recession, things did not turn out exactly like economic theory predicts. Why? Recent evidence suggests that a fundamental change has occurred in the structure of international trade that reduces the impact of a depreciating currency on trade flows. What has changed is where businesses source the things they need to produce the goods they export. In the past, manufacturers found most components needed to produce their goods at home. Now they increasingly look abroad for such inputs. As a result, exports now incorporate a lot more imports. This means that many products are no longer “made in the United States” or in another particular country. Instead, they are “made in the world.”

It is still the case that when a currency such as the yen depreciates, it reduces the price of goods sold by Japanese producers in the United States. But it also increases the price of the things that Japanese producers import to make those exported goods. Therefore, the production costs of Japanese producers increase and the competitiveness of their exports declines. As a result, depreciating currencies have a smaller effect on exports.

Economists at the Organization for Economic Cooperation and Development and the World Trade Organization have measured the impact of global supply chains on trade flows. In particular, they measured how much foreign content there is in each nation’s exports, finding a sizeable increase since the mid-1990s. For example, the foreign content of Switzerland’s exports increased from 17.5 percent in 1995 to 21.7 percent in 2011, while the imported content of South Korea’s exports almost doubled, from 22.3 percent in 1995 to 41.6 percent in 2011. Using these figures, these economists found that the effect of currency movements on exports and imports has fallen over time, by as much as 30 percent in some countries. The implication of these findings is that as countries

become more vertically integrated via global value chains, exchange rate variations will have a diminishing impact on trade flows. Thus, currency fluctuations will have a smaller role as shock absorbers that direct global demand toward weaker economies from stronger economies.

Japan provides an example of how large currency depreciations do not deliver the export boost they once did. In 2013, the Bank of Japan enacted a massive stimulus program that increased the supply of yen and resulted in the currency’s steep depreciation against the dollar and the euro. That strategy was a main component of Japan’s arsenal of measures designed to boost the economy out of a long period of stagnation. But what followed was that the yen’s depreciation had negligible effect on Japanese exports, thus failing to jump-start economic growth.

A similar pattern emerged following the European Central Bank’s decision to enact its expansionary monetary policy in 2015 to boost economic growth by aiding exports. But once again, the impact of a weakened euro was modest.

Simply put, the extent to which currency movements increase or decrease exports depends on how large their foreign content is. For the world economy as a whole, the foreign share of U.S. exports is at the lower end of the global range, at around 15 percent, compared with more than 25 percent in Germany.

What do you think? Does currency depreciation solve the economic problems of a country?

Sources: Paul Hannon, “Why Weak Currencies Have a Smaller Effect on Exports,” *The Wall Street Journal*, December 28, 2015; Organization for Economic Cooperation and Development, *Measuring Trade in Value Added: An OECD-WTO Joint Initiative*, October, 2015; World Trade Organization and the Institute of Developing Economies, *Trade Patterns and Global Value Chains in East Asia*, 2011; Albert Park, Gaurav Nayyar, and Patrick Low, *Supply Chain Perspectives and Issues: A Literature Review*, World Trade Organization and the Fung Global Institute, 2013.

The Absorption Approach to Currency Depreciation

According to the elasticities approach, currency depreciation offers a price incentive to reduce imports and increase exports. Even if elasticity conditions are favorable, whether the home country’s trade balance will actually improve may depend on how the economy reacts to the depreciation. The absorption approach⁴ provides insights into this question by

⁴See Donald S. Kemp, “A Monetary View of the Balance of Payments,” *Review*, Federal Reserve Bank of St. Louis, April 1975, pp. 14–22; and Thomas M. Humphrey, “The Monetary Approach to Exchange Rates: Its Historical Evolution and Role in Policy Debates,” *Economic Review*, Federal Reserve Bank of Richmond, July–August 1978, pp. 2–9.

considering the impact of depreciation on the spending behavior of the domestic economy and the influence of domestic spending on the trade balance.

The absorption approach starts with the idea that the value of total domestic output (Y) equals the level of total spending. Total spending consists of consumption (C), investment (I), government expenditures (G), and net exports ($X - M$). This relation can be written as follows:

$$Y = C + I + G + (X - M)$$

The absorption approach then consolidates $C + I + G$ into a single term A that is referred to as absorption, and designates net exports ($X - M$) as B . Total domestic output equals the sum of absorption plus net exports:

$$Y = A + B$$

This can be rewritten as follows:

$$B = Y - A$$

This expression suggests that the balance of trade (B) equals the difference between total domestic output (Y) and the level of absorption (A). If national output exceeds domestic absorption, the economy's trade balance will be positive. Conversely, a negative trade balance suggests that an economy is spending beyond its ability to produce.

The absorption approach predicts that currency depreciation will improve an economy's trade balance only if national output rises relative to absorption. This relation means that a country must increase its total output, reduce its absorption, or do some combination of the two. The following examples illustrate these possibilities.

Assume that an economy faces *unemployment* as well as a *trade deficit*. With the economy operating below maximum capacity, the price incentives of depreciation would tend to direct idle resources into the production of goods for export, in addition to diverting spending away from imports to domestically produced substitutes. The impact of the depreciation is to expand domestic output as well as to improve the trade balance. It is no wonder that policy makers tend to view currency depreciation as an effective tool when an economy faces unemployment with a trade deficit.

However, in the case of an economy operating at *full employment*, no unutilized resources are available for additional production. National output is at a fixed level. The only way that currency depreciation can improve the trade balance is for the economy to somehow cut domestic absorption, freeing resources needed to produce additional export goods and import substitutes. Domestic policy makers could decrease absorption by adopting restrictive fiscal and monetary policies in the face of higher prices resulting from the depreciation. This decrease would result in sacrifice on the part of those who bear the burden of such measures. Currency depreciation may be considered inappropriate when an economy is operating at maximum capacity.

The absorption approach goes beyond the elasticity approach that views the economy's trade balance as distinct from the rest of the economy. Instead, currency depreciation is viewed in relation to the economy's utilization of its resources and level of production. The two approaches are complementary.

The Monetary Approach to Currency Depreciation

A survey of the traditional approaches to currency depreciation reveals a major shortcoming. According to the elasticities and absorption approaches, monetary consequences are not associated with balance-of-payments adjustment; or to the extent that such

consequences exist, they can be neutralized by domestic monetary authorities. The elasticities and absorption approaches apply only to the trade account of the balance-of-payments, neglecting the implications of capital movements. The *monetary approach* to depreciation addresses this shortcoming.⁵ According to the monetary approach, currency depreciation may induce a *temporary* improvement in a nation's balance-of-payments position. Assume that equilibrium initially exists in the home country's money market. A depreciation of the home currency would increase the price level—that is, the domestic currency prices of potential imports and exports. This increase would increase the demand for money because larger amounts of money are needed for transactions. If that increased demand is not fulfilled from domestic sources, an inflow of money from overseas occurs. This inflow results in a balance-of-payments surplus and a rise in international reserves. The surplus does not last forever. By adding to the international component of the home country money supply, the currency depreciation leads to an increase in spending (absorption) that reduces the surplus. The surplus eventually disappears when equilibrium is restored in the home country's money market. The effects of depreciation on real economic variables are temporary. *Over the long run, currency depreciation merely raises the domestic price level.*

SUMMARY

1. Currency depreciation (devaluation) may affect a nation's trade position through its impact on relative prices, incomes, and the purchasing power of money balances.
2. When all of a firm's inputs are acquired domestically and their costs are denominated in the domestic currency, an appreciation in the domestic currency's exchange value tends to increase the firm's costs by the same proportion, in terms of the foreign currency. Conversely, a depreciation of the domestic currency's exchange value tends to reduce the firm's costs by the same proportion in terms of the foreign currency.
3. Manufacturers often obtain inputs from abroad (foreign sourcing) whose costs are denominated in terms of a foreign currency. As foreign currency-denominated costs become a larger portion of a producer's total costs, an appreciation of the domestic currency's exchange value leads to a smaller increase in the foreign currency cost of the firm's output and a larger decrease in the domestic cost of the firm's output—compared to the cost changes that occur when all input costs are denominated in the domestic currency. The opposite applies for currency depreciation.
4. By increasing (decreasing) relative U.S. production costs, a dollar appreciation (depreciation) tends to raise (lower) U.S. export prices in terms of a foreign currency, which induces a decrease (increase) in the quantity of U.S. goods sold abroad; similarly, a dollar appreciation (depreciation) tends to raise (lower) the amount of U.S. imports.
5. According to the elasticities approach, currency depreciation leads to the greatest improvement in a country's trade position when demand elasticities are high. Recent empirical studies indicate that the estimated demand elasticities for most nations are quite high.
6. The time path of currency depreciation can be explained in terms of the J-curve effect. According to this concept, the response of trade flows to changes in relative prices increases with the passage of time. Currency depreciation tends to worsen a country's trade balance in the short run, only to be followed by an improvement in the long run (assuming favorable elasticities).

⁵Giovanni Olivei, "Exchange Rates and the Prices of Manufacturing Products Imported into the United States," *New England Economic Review*, First Quarter 2002, pp. 4–6.

7. The extent that exchange rate changes lead to changes in import prices and export prices is known as the pass-through relation. Complete (partial) pass-through occurs when a change in the exchange rate brings about a proportionate (less than proportionate) change in export prices and import prices. Empirical evidence suggests that pass-through tends to be partial rather than complete. Partial pass-through is explained by currency invoicing, market share strategies, and sizable distribution costs.
8. The absorption approach emphasizes the income effects of currency depreciation. According to this view, a depreciation may initially stimulate a nation's exports and production of import-competing goods. But this stimulus will promote excess domestic spending unless real output can be expanded or domestic absorption reduced. The result would be a return to a payments deficit.
9. The monetary approach to depreciation emphasizes the effect that depreciation has on the purchasing power of money balances and the resulting impacts on domestic expenditures and import levels. According to the monetary approach, the influence of currency depreciation on real output is temporary; over the long run, depreciation merely raises the domestic price level.

KEY CONCEPTS AND TERMS

Absorption approach (p. 444)
Elasticity approach (p. 444)

Exchange rate pass-through (p. 450)
J-curve effect (p. 447)

Marshall–Lerner condition (p. 445)
Monetary approach (p. 444)

STUDY QUESTIONS

1. How does a currency depreciation affect a nation's balance of trade?
2. Three major approaches to analyzing the economic impact of currency depreciation are (a) the elasticities approach, (b) the absorption approach, and (c) the monetary approach. Distinguish among the three.
3. What is meant by the Marshall–Lerner condition? Do recent empirical studies suggest that world elasticity conditions are sufficiently high to permit successful depreciations?
4. How does the J-curve effect relate to the time path of currency depreciation?
5. What implications does currency pass-through have for a nation whose currency depreciates?
6. According to the absorption approach, does it make any difference whether a nation's currency depreciates when the economy is operating at less than full capacity versus at full capacity?
7. How can currency depreciation–induced changes in household money balances promote payments equilibrium?
8. Suppose ABC Inc., a U.S. auto manufacturer, obtains all of its auto components in the United States and that its costs are denominated in dollars. Assume that the dollar's exchange value appreciates by 50 percent against the Mexican peso. What impact does the dollar appreciation have on the firm's international competitiveness? What about a dollar depreciation?
9. Suppose ABC Inc., a U.S. auto manufacturer, obtains some of its auto components in Mexico and that the costs of these components are denominated in pesos; the costs of the remaining components are denominated in dollars. Assume that the dollar's exchange value appreciates by 50 percent against the peso. Compared to your answer in study question 8, what impact will the dollar appreciation have on the firm's international competitiveness? What about a dollar depreciation?
10. Assume that the United States exports 1,000 computers costing \$3,000 each and imports 150 U.K. autos at a price of £10,000 each. Assume that the dollar/pound exchange rate is \$2 per pound.
 - a. Calculate, in dollar terms, the U.S. export receipts, import payments, and trade balance prior to a depreciation of the dollar's exchange value.

- b. Suppose the dollar's exchange value depreciates by 10 percent. Assuming that the price elasticity of demand for U.S. exports equals 3.0 and the price elasticity of demand for U.S. imports equals 2.0, does the dollar depreciation improve or worsen the U.S. trade balance? Why?
- c. Now assume that the price elasticity of demand for U.S. exports equals 0.3 and the price elasticity of demand for U.S. imports equals 0.2. Does this change the outcome? Why?

EXPLORING FURTHER

For a presentation of the Mechanisms of International Adjustment, go to *Exploring Further 13.1*, which can be found in MindTap.

The effects of exchange rate pass-through are more fully discussed in *Exploring Further 13.2*, which can be found in MindTap.

Exchange Rate Systems and Currency Crises



Previous chapters have discussed the determination of exchange rates and their effects on the balance-of-payments. This chapter surveys the exchange rate practices that are currently being used. The discussion focuses on the nature and operation of actual exchange rate systems and identifies economic factors that influence the choice of alternative exchange rate systems. The chapter also discusses the operation and effects of currency crises.

Exchange Rate Practices

In choosing an exchange rate system, a nation must decide whether to allow its currency to be determined by market forces (floating rate) or to be fixed (pegged) against some standard of value. If a nation adopts a floating rate, it must decide whether to float independently, float in unison with a group of other currencies, or crawl according to a predetermined formula such as relative inflation rates. The decision to anchor a currency includes the options of anchoring to a single currency, a basket of currencies, or gold. Since 1971, the technique of expressing official exchange rates in terms of gold has not been used; gold has been phased out of the international monetary system.

Members of the International Monetary Fund (IMF) have been free to follow any exchange rate policy that conforms to three principles: Exchange rates should not be manipulated to prevent effective balance-of-payments adjustments or gain unfair competitive advantage over other members. Members should act to counter short-term disorderly conditions in exchange markets. When members intervene in exchange markets, they should take into account the interests of other members. Table 14.1 summarizes the exchange rate practices used by IMF member countries.

What characteristics make a country more suited for fixed rather than flexible exchange rates? Among these characteristics is the size of the nation, openness to trade, the degree of labor mobility, and the availability of fiscal policy to cushion downturns. Table 14.2

TABLE 14.1**Exchange Rate Arrangements of IMF Members,* 2015**

Exchange Arrangement	Percentage of IMF Members
Hard pegs	
No separate legal tender	6.8
Currency board	5.8
Soft pegs	
Conventional pegged (fixed) exchange rates	23.0
Stabilized arrangement	11.5
Crawling peg	1.6
Crawling-like arrangement	10.5
Pegged exchange rate within horizontal bands	0.5
Floating	
Managed floating	19.4
Free floating	15.7
Other	5.2
	100.0

*Includes 188 member countries.

Source: International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions, 2015*. See also International Monetary Fund, *Classification of Exchange Rate Arrangements and Monetary Policy Frameworks*, available at <http://www.imf.org/>.

summarizes the usage of these factors. The important point is that no single currency system is right for all countries or at all times. The choice of an exchange rate system should depend on the particular circumstances facing the country in question.

TABLE 14.2**Choosing an Exchange Rate System**

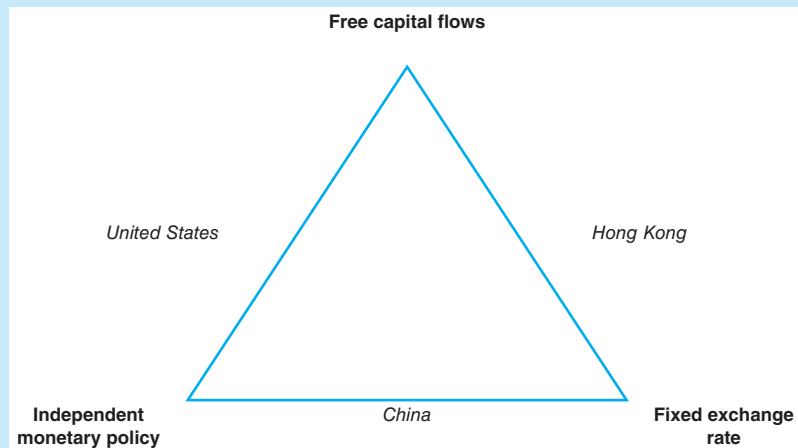
Characteristics of Economy	Implication for the Desired Degree of Exchange Rate Flexibility
Size and openness of the economy	If trade is a large share of national output, then the costs of currency fluctuations can be high. This suggests that small, open economies may best be served by fixed exchange rates.
Inflation rate	If a country has much higher inflation than its trading partners, its exchange rate needs to be flexible to prevent its goods from becoming uncompetitive in world markets. If inflation differentials are more modest, a fixed rate is less troublesome.
Labor market flexibility	The more rigid wages are, the greater the need for a flexible exchange rate to help the economy respond to an external shock.
Degree of financial development	In developing countries with immature financial markets, a freely floating exchange rate may not be sensible because a small number of foreign exchange trades can cause big swings in currencies.
Credibility of policy makers	The weaker the reputation of the central bank, the stronger the case for pegging the exchange rate to build confidence that inflation will be controlled.
Capital mobility	The more open an economy to international capital, the harder it is to sustain a fixed rate.

Choosing an Exchange Rate System: Constraints Imposed by Free Capital Flows

The choice of an exchange rate system depends on many variables including the freedom of capital to flow into and out of a country. One consequence of allowing free capital flows is that it constrains a country's choice of an exchange rate system and its ability to operate an independent monetary policy. For reasons related to the tendency for capital to flow where returns are the highest, a country can maintain only two of the following three policies—free capital flows, a fixed exchange rate, and an independent monetary policy. This tendency is illustrated in Figure 14.1. Countries must choose to be on one side of the triangle, adopting the policies at each end, but forgoing the policy on the opposite corner. Economists refer to this restriction as the **impossible trinity**.¹

FIGURE 14.1

The Impossible Trinity



Countries can adopt only two of the following three policies—free capital flows, a fixed exchange rate, and an independent monetary policy.

The easiest way to understand this restriction is through specific examples. The United States allows free capital flows and has an independent monetary policy, but it has a flexible exchange rate. To combat inflation, suppose the Federal Reserve (also known as the Fed) increases its target interest rate relative to foreign interest rates, inducing capital to flow into the United States. By increasing the demand for dollars relative to other currencies, these capital inflows cause the dollar to appreciate against other currencies. Conversely, if the Fed reduces its target interest rate, net capital outflows would decrease the demand for dollars, causing the dollar to depreciate against other currencies. Therefore, the United States, by not having a fixed exchange rate, can maintain both an independent monetary policy and free capital flows.

¹See Robert Mundell, “The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability,” *IMF Staff Papers*, March 1962; and “Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates,” *Canadian Journal of Economics*, November 1963.

In contrast, Hong Kong essentially fixes the value of its currency to the U.S. dollar and allows free capital flows. The trade-off is that Hong Kong sacrifices the ability to use monetary policy to influence domestic interest rates. Unlike the United States, Hong Kong cannot decrease interest rates to stimulate a weak economy. If Hong Kong's interest rates were to diverge from world rates, capital would flow into or out of the Hong Kong economy as in the U.S. case above. Under a flexible exchange rate, these flows would cause the exchange value of the Hong Kong dollar to change relative to that of other currencies. Under a fixed exchange rate, the monetary authority must offset these capital flows by purchasing domestic or foreign currency in order to keep the supply and demand for its currency fixed and the exchange rate constant. Hong Kong loses the ability to have an independent monetary policy if it allows free capital flows and maintains a fixed exchange rate.

Similar to the case of Hong Kong, until 2005, China tied its exchange rate to the U.S. dollar. China could conduct an independent monetary policy because it set restrictions on capital flows. In China's case, world and domestic interest rates could differ because controls on the transfer of funds into and out of the country limited the resulting changes in the money supply and the corresponding pressures on the exchange rate. As these three examples show, if a country chooses to allow capital to flow freely, it must also choose between having an independent monetary policy or a fixed exchange rate.

How does a country decide whether to give up a fixed exchange rate, an independent monetary policy, or free capital movements? The answer largely depends on global economic trends. The post-World War II era saw substantial integration of markets and increasing international trade. Countries such as the United States wanted to facilitate this increase in trade by eliminating the risk of exchange rate fluctuations. In 1944, representatives from major industrial countries designed and implemented a plan that encouraged fixed exchange rates for the dollar and other currencies while maintaining independent monetary policies. Just as with the systems described previously, something had to be given up—the free movement of capital flows. Participating countries imposed ceilings on the interest rates that banks could offer depositors and restrictions on the types of assets in which banks could invest. Governments intervened in financial markets to direct capital toward strategic domestic sectors. Although none of these controls alone prevented international capital flows, in combination they allowed governments to reduce the amount of international capital transactions.²

Fixed Exchange Rate System

Few nations have allowed their currencies' exchange values to be determined solely by the forces of supply and demand in a free market. Until the industrialized nations adopted managed floating exchange rates in the 1970s, the practice generally was to maintain a pattern of **fixed exchange rates** among national currencies. Changes in national exchange rates presumably were initiated by domestic monetary authorities when long-term market forces warranted it.

Use of Fixed Exchange Rates

Fixed exchange rates tend to be used primarily by small, developing nations whose currencies are anchored to a **key currency** such as the U.S. dollar. A key currency is widely traded on world money markets, has demonstrated relatively stable values over time, and been widely accepted as a means of international settlement. Table 14.3 identifies the major key

² See *Economic Report of the President*, 2004, Chapters 13–14.

TABLE 14.3

Key Currencies: Currency Composition of Official Foreign Exchange Reserves of the Member Countries of the International Monetary Fund, 2016

Key Currency	Composition of Official Foreign Exchange Reserves
U.S. dollar	63.9%
Euro	19.7
British pound	4.4
Japanese yen	4.2
Canadian dollar	2.0
Australian dollar	1.8
Chinese yuan	1.1
Other	<u>2.9</u>
	100.0

Source: From *Currency Composition of Official Foreign Exchange Reserves (COFER)*, International Monetary Fund, 2017, available at www.imf.org.

currencies of the world. Instead of anchoring the value of the domestic currency to another currency, a country could fix its currency's value to a commodity such as gold.

One reason why developing nations choose to anchor their currencies to a key currency is that it is used as a means of international settlement. Consider a Norwegian importer who wants to purchase Argentinean beef over the next year. If the Argentine exporter is unsure of what the Norwegian krone will purchase in one year, he might reject the krone in settlement. Similarly, the Norwegian importer might doubt the value of Argentina's peso. One solution is for the contract to be written in terms of a key currency. Generally speaking, smaller nations with relatively undiversified economies and large foreign trade sectors have been inclined to anchor their currencies to one of the key currencies.

Maintaining an anchor to a key currency provides several benefits for developing nations. First, the prices of the traded products of many developing nations are determined primarily in the markets of industrialized nations such as the United States; by anchoring to the dollar, these nations can stabilize the domestic currency prices of their imports and exports. Second, many nations with high inflation have anchored to the dollar (the United States has relatively low inflation) in order to exert restraint on domestic policies and reduce inflation. By making the commitment to stabilize their exchange rates against the dollar, governments hope to convince their citizens that they are willing to adopt the responsible monetary policies necessary to achieve low inflation. Anchoring the exchange rate may lessen inflationary expectations, leading to lower interest rates, a lessening of the loss of output due to disinflation, and moderation of price pressures.

In maintaining fixed exchange rates, nations must decide whether to anchor their currencies to another currency or a currency basket. Anchoring to a *single currency* is generally done by developing nations whose trade and financial relations are mainly with a single industrial country partner. Therefore, the developing country anchors its currency to the currency of its dominant trading partner.

Developing nations with more than one major trading partner often anchor their currencies to a group or *basket of currencies*. The basket is composed of prescribed quantities of foreign currencies in proportion to the amount of trade done with the nation anchoring its currency. Once the basket has been selected, the currency value of the nation is

computed using the exchange rates of the foreign currencies in the basket. Anchoring the domestic currency value of the basket enables a nation to average out fluctuations in export or import prices caused by exchange rate movements. The effects of exchange rate changes on the domestic economy are thus reduced. Rather than constructing their own currency basket, some nations anchor the value of their currencies to the **special drawing right (SDR)**, a basket of four currencies established by the IMF, as discussed in Chapter 10.

Par Value and Official Exchange Rate

Under a fixed exchange rate system, governments have assigned their currencies a **par value** in terms of gold or other key currencies. By comparing the par values of two currencies we can determine their **official exchange rate**. Under the gold standard, the official exchange rate between the U.S. dollar and the U.K. pound was $\$2.80 = \text{£}1$ as long as the United States bought and sold gold at a fixed price of \$35 per ounce and the United Kingdom bought and sold gold at $\text{£}12.50$ per ounce ($\$35.00/\text{£}12.50 = \2.80 per pound). The major industrial nations set their currencies' par values in terms of gold until gold was phased out of the international monetary system in the early 1970s.

Rather than defining the par value of a currency in terms of a commodity, countries may anchor their currencies against another key currency. Developing nations often set the values of their currencies to that of a large, low-inflation country such as the United States. The monetary authority of Bolivia may define its official exchange rate as 20 pesos per dollar.

INTERNATIONAL FINANCE APPLICATION

Russia's Central Bank Fails to Offset the Ruble's Collapse

Although Vladimir Putin has successfully maintained tight control of Russia's political system, he has not been able to control global financial markets. Such was the case in 2014 when the ruble's exchange value depreciated about 40 percent over three weeks. What led to this currency crisis, and how did Russia respond?

The crisis was largely due to Russia's international woes. First, the country is highly dependent on its oil and natural gas companies. These energies account for about two-thirds of Russia's exports and over half of its federal budget. With oil prices declining about 50 percent in 2014, downward pressure was placed on the ruble. Second, the war that Russia fomented in Ukraine in 2014 resulted in the United States and the European Union imposing financial sanctions on Russian firms and banks, making it difficult for them to borrow abroad. As the Russian economy weakened and investor confidence deteriorated, many domestic and foreign investors scrambled to take their money out of the country: They sold rubles for stronger currencies, such as the U.S. dollar and the euro, and placed these funds in



foreign bank accounts. This put downward pressure on the ruble's exchange value.

With its economy tanking and the public's confidence dwindling, the Russian central bank intervened in the foreign exchange market to shore up the value of the ruble. First, it used some of its foreign exchange reserves to purchase rubles. However, this policy was insufficient in offsetting the ruble's depreciation. Next, the central bank dramatically raised its key interest rate from 10.5 percent to 17 percent in an attempt to keep Russian money in the economy and to try to bring investors from abroad who are attracted by higher interest rates. Despite these policies, the ruble's exchange value continued to decline as Russia's economy headed into recession, global oil prices weakened, and economic sanctions continued to bite.

With interest rate increases and sales of foreign reserves proving ineffectual, Russia considered other options to offset the ruble's decline. One would be capital controls whereby the Kremlin could limit people's ability to convert rubles into foreign currency and take it out of

(continued)

the country. However, because the central bank and the ministry of finance considered capital controls to be an extreme measure, they were opposed to using them. While the ruble recovered to some extent in 2015–2017, it still hadn't regained its prior strength moving into 2018. At the writing of this textbook, the future of the ruble looked grim.

What do you think? What difficulties do central banks have in stabilizing weak currencies?

Sources: “As Ye Sow, So Shall Ye Reap,” *The Economist*, December 20, 2014; “Does Economic Turbulence Hurt Putin’s Power?” *PBS NewsHour*, December 16, 2014; Andrey Ostroukh, Alexander Kolyandr, and Chiara Albanese, “Russian Ruble Hits New Low Despite Rate Rise,” *The Wall Street Journal*, December 16, 2014.

Exchange Rate Stabilization

We have learned that a first requirement for a nation adopting a fixed exchange rate system is to define the official exchange rate of its currency. The next step is to set up an **exchange stabilization fund** to defend the official rate. Through purchases and sales of foreign currencies, the exchange stabilization fund attempts to ensure that the market exchange rate does not move above or below the official exchange rate.

In Figure 14.2, assume that the market exchange rate equals \$2.80 per pound, seen at the intersection of the demand and supply schedules of U.K. pounds, D_0 and S_0 . Also assume that the official exchange rate is defined as \$2.80 per pound. Now suppose that rising interest rates in the United Kingdom cause U.S. investors to demand additional pounds to finance the purchase of U.K. securities; let the demand for pounds rise from D_0 to D_1 in Figure 14.2(a). Under free market conditions, the dollar would depreciate from \$2.80 per pound to \$2.90 per pound. But under a fixed exchange rate system, the monetary authority will attempt to defend the official rate of \$2.80 per pound. At this rate, there exists an excess demand for pounds equal to £40 billion; this means that the United Kingdom faces an excess supply of dollars in the same amount. To keep the market exchange rate from depreciating beyond \$2.80 per pound, the U.S. exchange stabilization fund would purchase the excess supply of dollars with pounds. The supply of pounds thus rises from S_0 to S_1 , resulting in a stabilization of the market exchange rate at \$2.80 per pound.

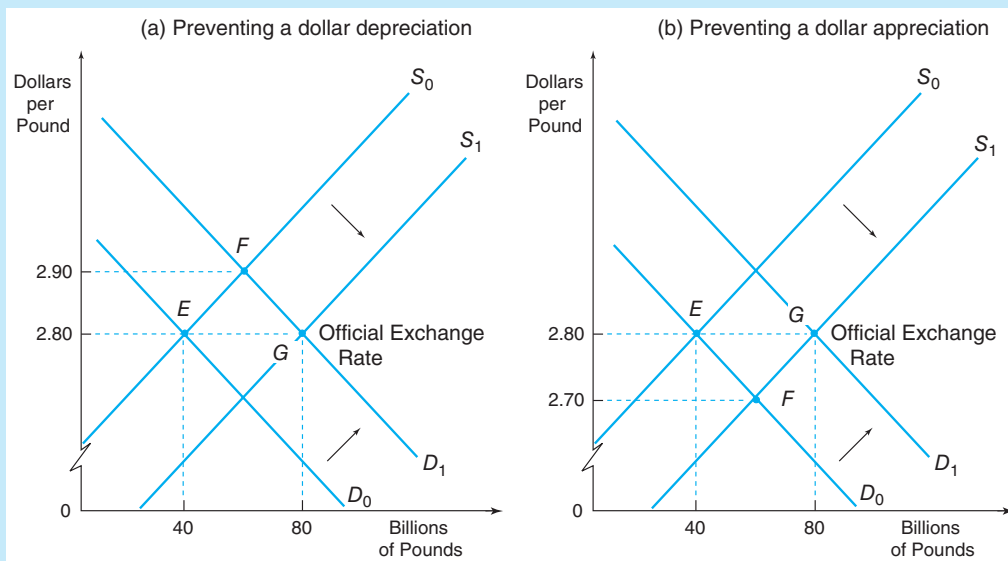
Conversely, suppose that increased prosperity in the United Kingdom leads to rising imports from the United States; the supply of pounds increases from S_0 to S_1 in Figure 14.2(b). At the official exchange rate of \$2.80 per pound, there exists an excess supply of pounds equal to £40 billion. To keep the dollar from appreciating against the pound, the U.S. stabilization fund would purchase the excess supply of pounds with dollars. The demand for pounds thus increases from D_0 to D_1 , resulting in a stabilization of the market exchange rate at \$2.80 per pound.

This example illustrates how an exchange stabilization fund undertakes its pegging operations to offset short-term fluctuations in the market exchange rate. Over the long run, the official exchange rate and the market exchange rate may move apart, reflecting changes in fundamental economic conditions—income levels, tastes and preferences, and technological factors. In the case of a **fundamental disequilibrium**, the cost of defending the existing official rate may become prohibitive.

Consider the case of a deficit nation that finds its currency weakening. Maintaining the official rate may require the exchange stabilization fund to purchase sizable quantities of its currency with foreign currencies or other reserve assets. These purchases may impose a severe drain on the deficit nation’s stock of international reserves. Although the deficit nation may be able to borrow reserves from other nations or from the IMF to continue the defense of its exchange rate, such borrowing privileges are generally of limited magnitude. At the same time, the deficit nation will be undergoing internal adjustments to curb the

FIGURE 14.2

Exchange Rate Stabilization under a Fixed Exchange Rate System



To defend the official exchange rate of \$2.80 per pound, the central bank must supply all of the nation's currency that is demanded at the official rate and demand all of the nation's currency that is supplied to it at the official rate. To prevent a dollar depreciation, the central bank must purchase the excess supply of dollars with an equivalent amount of pounds. To prevent a dollar appreciation, the central bank must purchase the excess supply of pounds with an equivalent amount of dollars.

disequilibrium. These measures will likely be aimed at controlling inflationary pressures and raising interest rates to promote capital inflows and discourage imports. If the imbalance is persistent, the deficit nation may view such internal adjustments as too costly in terms of falling income and employment levels. Rather than continually resorting to such measures, the deficit nation may decide the reversal of the disequilibrium calls for an adjustment in the exchange rate itself. Under a system of fixed exchange rates, a chronic imbalance may be counteracted by a currency devaluation or revaluation.

Devaluation and Revaluation

Under a fixed exchange rate system, a nation's monetary authority may decide to pursue a balance-of-payments equilibrium by devaluing or revaluing its currency. The purpose of **devaluation** is to cause the home currency's exchange value to *depreciate*, thus counteracting a payments *deficit*. The purpose of currency **revaluation** is to cause the home currency's exchange value to *appreciate*, counteracting a payments *surplus*.

The terms *devaluation* and *revaluation* refer to a legal redefinition of a currency's par value under a system of fixed exchange rates. The terms *depreciation* and *appreciation* refer to the actual impact on the market exchange rate caused by a redefinition of a par value or to changes in an exchange rate stemming from changes in the supply of or demand for foreign exchange.

Devaluation and revaluation policies work on relative prices to divert domestic and foreign expenditures between domestic and foreign goods. By raising the home price of the

foreign currency, devaluation makes the home country's exports cheaper to foreigners in terms of the foreign currency, while making the home country's imports more expensive in terms of the home currency. Expenditures are diverted from foreign to home goods as home exports rise and imports fall. Revaluation discourages the home country's exports and encourages its imports, diverting expenditures from home goods to foreign goods.

Before implementing a devaluation or revaluation, the monetary authority must decide (1) if an adjustment in the official exchange rate is necessary to correct payment disequilibrium, (2) when the adjustment will occur, and (3) how large the adjustment should be. Exchange rate decisions of government officials may be incorrect—that is, ill-timed and of improper magnitude.

In making the decision to undergo a devaluation or revaluation, monetary authorities generally attempt to hide behind a veil of secrecy. Just hours before the decision is to become effective, public denials of any such policies by official government representatives are common. This is to discourage currency speculators who try to profit by shifting funds from a currency falling in value to one rising in value. Given the destabilizing impact that massive speculation can exert on financial markets, it is hard to criticize monetary authorities for being secretive in their actions. The need for devaluation tends to be obvious to outsiders as well as to government officials and in the past has nearly always resulted in heavy speculative pressures. Table 14.4 summarizes the advantages and disadvantages of fixed exchange rates and floating exchange rates.

TABLE 14.4

Advantages and Disadvantages of Fixed Exchange Rates and Floating Exchange Rates

	Advantages	Disadvantages
Fixed exchange rates	Simplicity and clarity of exchange rate target	Loss of independent monetary policy
	Automatic rule for the conduct of monetary policy	Vulnerable to speculative attacks
	Keeps inflation under control	
Floating exchange rates	Continuous adjustment in the balance-of-payments	Conducive to price inflation
	Operate under simplified institutional arrangements	Disorderly exchange markets can disrupt trade and investment patterns
	Allow governments to set independent monetary and fiscal policies	Encourage reckless financial policies on the part of government

Bretton Woods System of Fixed Exchange Rates

An example of fixed exchange rates is the **Bretton Woods system**. In 1944, delegates from 44 member nations of the United Nations met at Bretton Woods, New Hampshire, to create a new international monetary system. Members were aware of the unsatisfactory monetary experience of the 1930s during which the international gold standard collapsed as the result of the economic and financial crises of the Great Depression and nations experimented unsuccessfully with floating exchange rates and exchange controls. The delegates wanted to establish international monetary order and avoid the instability and nationalistic practices that had been in effect until 1944.

The international monetary system that was created became known as the Bretton Woods system. The founders felt that neither completely fixed exchange rates nor floating rates were

optimal; instead, they adopted a kind of semi-fixed exchange rate system known as **adjustable pegged exchange rates**. The Bretton Woods system lasted from 1946 until 1973.

The main feature of the adjustable pegged system was that currencies were tied to each other to provide stable exchange rates for commercial and financial transactions. When the balance-of-payments moved away from its long run equilibrium position, a nation could re-peg its exchange rate via devaluation or revaluation policies. Member nations agreed in principle to defend existing par values as long as possible in times of balance-of-payments disequilibrium. They were expected to use fiscal and monetary policies first to correct payments imbalances. But if reversing a persistent payments imbalance meant severe disruption to the domestic economy in terms of inflation or unemployment, member nations could correct this *fundamental disequilibrium* by repegging their currencies up to 10 percent without permission from the IMF and by greater than 10 percent with the fund's permission.

Under the Bretton Woods system, each member nation set the par value of its currency in terms of gold or, alternatively, the gold content of the U.S. dollar in 1944. Market exchange rates were almost fixed, being kept within a band of 1 percent on either side of parity for a total spread of 2 percent. National exchange stabilization funds were used to maintain the band limits. In 1971, the exchange support margins were widened to 2.25 percent on either side of parity to eliminate payments imbalances by setting in motion corrective trade and capital movements. Devaluations or revaluations could be used to adjust the par value of a currency when it became overvalued or undervalued.

Although adjustable pegged rates are intended to promote a viable balance-of-payments adjustment mechanism, they have been plagued with operational problems. In the Bretton Woods system, adjustments in prices and incomes often conflicted with domestic stabilization objectives. Currency devaluation was considered undesirable because it seemed to indicate a failure of domestic policies and a loss of international prestige. Conversely, revaluations were unacceptable to exporters whose livelihoods were vulnerable to such policies. Repegging exchange rates only as a last resort often meant that when adjustments did occur, they were sizable. Adjustable pegged rates posed difficulties in estimating the equilibrium rate to which a currency should be repegged. Once the market exchange rate reached the margin of the permissible band around parity, it became a rigid fixed rate that presented speculators with a one-way bet. Given persistent weakening pressure at the band's outer limit, speculators had the incentive to move out of a weakening currency that was expected to depreciate further in value as the result of official devaluation.

These problems reached a climax in the early 1970s. Faced with continuing and growing balance-of-payments deficits, the United States suspended the dollar's convertibility into gold in August 1971. This suspension terminated the U.S. commitment to exchange gold for dollars at \$35 per ounce—a commitment that existed for 37 years. This policy abolished the tie between gold and the international value of the dollar, thus floating the dollar and permitting its exchange rate to be set by market forces. The floating of the dollar terminated U.S. support of the Bretton Woods system of fixed exchange rates and led to the demise of that system.

Floating Exchange Rates

Instead of adopting fixed exchange rates, some nations allow their currencies to float in the foreign exchange market. By **floating** (or flexible) **exchange rates**, we mean currency prices that are established daily in the foreign exchange market, without restrictions imposed by government policy on the extent that the prices can move. With floating rates, there is an equilibrium exchange rate that equates the demand for and supply of the home currency. Changes in the exchange rate will ideally correct a payments imbalance by bringing about

shifts in imports and exports of goods, services, and short-term capital movements. The exchange rate depends on relative productivity levels, interest rates, inflation rates, and other factors discussed in Chapter 12.

Unlike fixed exchange rates, floating exchange rates are not characterized by par values and official exchange rates; they are determined by market supply and demand conditions rather than central bankers. Although floating rates do not have an exchange stabilization fund to maintain existing rates, it does not necessarily follow that floating rates must fluctuate erratically. They will do so if the underlying market forces become unstable. Because there is no exchange stabilization fund under floating rates, any holdings of international reserves serve as working balances rather than to maintain a given exchange rate for any currency.

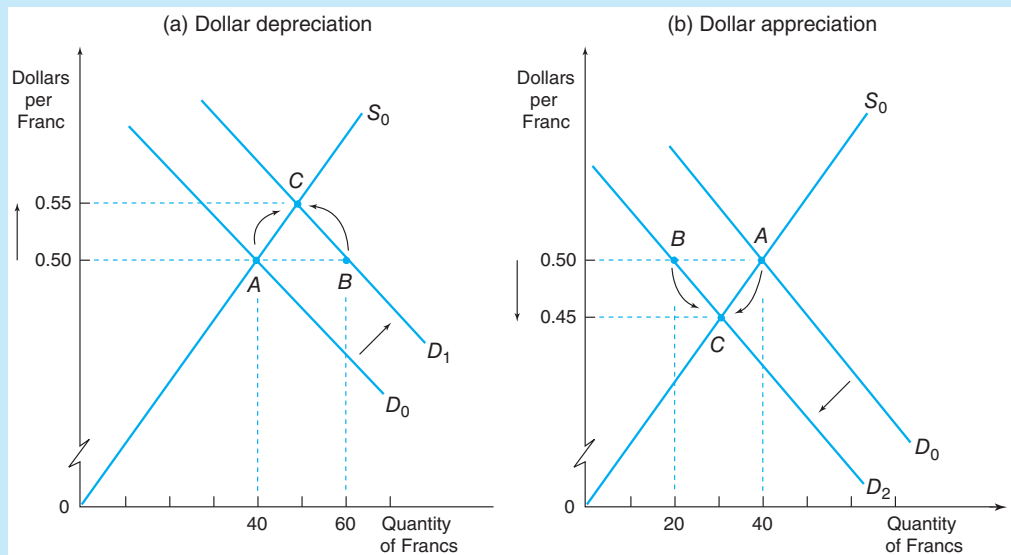
Achieving Market Equilibrium

How do floating exchange rates promote payments equilibrium for a nation? Consider Figure 14.3, which illustrates the foreign exchange market in Swiss francs in the United States. The intersection of supply schedule S_0 and demand schedule D_0 determines the equilibrium exchange rate of \$0.50 per franc.

Referring to Figure 14.3(a), suppose a rise in real income causes U.S. residents to demand more Swiss cheese and watches, and therefore more francs; let the demand for francs rise from D_0 to D_1 . Initially the market is in disequilibrium because the quantity of francs demanded (60 francs) exceeds the quantity supplied (40 francs) at the exchange rate of \$0.50 per franc. The excess demand for francs leads to an increase in the exchange rate from

FIGURE 14.3

Market Adjustment under Floating Exchange Rates



Under a floating exchange rate system, continuous changes in currency values restore payments equilibrium at which the quantity supplied and quantity demanded of a currency are equal. Starting at equilibrium point A, an increase in the demand for francs leads to a depreciation of the dollar against the franc; conversely, a decrease in the demand for francs leads to an appreciation of the dollar against the franc.

\$0.50 to \$0.55 per franc; the dollar falls in value or depreciates against the franc, while the franc rises in value, or appreciates against the dollar. The higher value of the franc prompts Swiss residents to increase the quantity of francs supplied on the foreign exchange market to purchase more U.S. goods that are now cheaper in terms of the franc. At the same time, it dampens U.S. demand for more expensive Swiss goods. Market equilibrium is restored at the exchange rate of \$0.55 per franc when the quantities of francs supplied and demanded are equal.

Suppose instead that real income in the United States falls, causing U.S. residents to demand less Swiss cheese and watches and fewer francs. In Figure 14.3(b), let the demand for francs fall from D_0 to D_2 . The market is initially in disequilibrium because the quantity of francs supplied (40 francs) exceeds the quantity demanded (20 francs) at the exchange rate of \$0.50 per franc. The excess supply of francs causes the exchange rate to fall from \$0.50 to \$0.45 per franc; the dollar appreciates against the franc while the franc depreciates against the dollar. Market equilibrium is restored at the exchange rate of \$0.45 per franc, when the quantities of francs supplied and demanded are equal.

These examples illustrate one argument in favor of floating rates: When the exchange rate is permitted to adjust freely in response to market forces, market equilibrium will be established at a point where the quantities of foreign exchange supplied and demanded are equal. If the exchange rate promotes market equilibrium, monetary authorities will not need international reserves for the purpose of intervening in the market to maintain exchange rates at their par value. Presumably, these resources can be used more productively elsewhere in the economy.

Moreover, the currencies of countries with trade surpluses will appreciate. So it costs more to buy goods from them and it costs them less to buy goods from others, and in the following years, their trade surplus goes down. Conversely, the currencies of trade deficit countries will depreciate. Thus, it costs less to buy goods from them and it costs them more to buy goods from others, and in the following years their trade deficit decreases. When currency markets work correctly and the exchange rate is determined by whatever lots of people want to pay to change one currency into another at a given time, the world's trade tends to balance out.

Trade Restrictions, Jobs, and Floating Exchange Rates

During economic downturns, labor unions often lobby for import restrictions in order to save jobs for domestic workers. Do import restrictions lead to increasing total employment in the economy?

As long as the United States maintains a floating exchange rate, the implementation of import restrictions to help one industry will gradually shift jobs from other industries in the economy to the protected industry with no significant impact on aggregate employment. Short run employment gains in the protected industry will be offset by long run employment losses in other industries.

Suppose the United States increases tariffs on autos imported from Japan. This policy would reduce auto imports causing a decrease in the U.S. demand for yen to pay for imported vehicles. With floating exchange rates, the yen would depreciate against the dollar (the dollar would appreciate against the yen) until balance in international transactions is attained. The change in the exchange rate would encourage Americans to purchase more goods from Japan and the Japanese to purchase fewer goods from the United States. Sales and jobs would be lost in other U.S. industries. Trade restrictions result in a zero-sum game within the United States. Job increases in Detroit are offset by job decreases in Los Angeles and Portland, with exchange rate changes imposing costs on unprotected workers in the U.S. economy.

Arguments for and against Floating Rates

One advantage claimed for floating rates is their simplicity. Floating rates allegedly respond quickly to changing supply and demand conditions, clearing the market of shortages or surpluses of a given currency. Instead of having formal rules of conduct among central bankers governing exchange rate movements, floating rates are market determined. They operate under simplified institutional arrangements that are relatively easy to enact.

Because floating rates fluctuate throughout the day, they permit continuous adjustment in the balance-of-payments. The adverse effects of prolonged disequilibrium that occur under fixed exchange rates are minimized under floating rates. It is also argued that floating rates partially insulate the home economy from external forces. This insulation means that governments will not have to restore payments equilibrium through painful inflationary or deflationary adjustment policies. Switching to floating rates frees a nation from having to adopt policies that perpetuate domestic disequilibrium as the price of maintaining a satisfactory balance-of-payments position. Nations have greater freedom to pursue policies that promote domestic balance than they do under fixed exchange rates.

Although there are strong arguments in favor of floating exchange rates, this system is often considered of limited usefulness for bankers and businesspeople. Critics of floating rates maintain that an unregulated market may lead to wide fluctuations in currency values, discouraging foreign trade and investment. For example, during 2007–2017 the dollar–euro rate swung up or down by about 20 percent no fewer than eight times, resulting in much financial uncertainty. Although traders and investors may be able to hedge exchange rate risk by dealing in the forward market, the cost of hedging may become prohibitively high.

Floating rates are supposed to allow governments to set independent monetary and fiscal policies. This flexibility may cause another sort of problem: *inflationary bias*. Under a system of floating rates, monetary authorities may lack the financial discipline required by a fixed exchange rate system. Suppose a nation faces relatively high rates of inflation compared with the rest of the world. This domestic inflation will have no negative impact on the nation's trade balance under floating rates because its currency will automatically depreciate in the exchange market. However, a protracted depreciation of the currency would result in persistently increasing import prices and a rising price level, making inflation self-perpetuating and the depreciation continuous. Because there is greater freedom for domestic financial management under floating rates, there may be less resistance to overspending and to its subsequent pressure on wages and prices.

Managed Floating Rates

The adoption of managed floating exchange rates by the United States and other industrial nations in 1973 followed the breakdown of the international monetary system based on fixed rates. Before the 1970s, only a handful of economists gave serious consideration to a general system of floating rates. Because of defects in the decision-making process caused by procedural difficulties and political biases, adjustments of par values under the Bretton Woods system were often delayed and discontinuous. It was recognized that exchange rates should be adjusted more promptly and in small but continuous amounts in response to evolving market forces. In 1973, a **managed floating system** was adopted, under which informal guidelines were established by the IMF for coordination of national exchange rate policies.

The motivation for the formulation of guidelines for floating arose from two concerns. The first was that nations might intervene in the exchange markets to avoid exchange rate alterations that would weaken their competitive position. When the United States suspended its gold convertibility pledge and allowed its overvalued dollar to float in the

exchange markets, it hoped that a free market adjustment would result in a depreciation of the dollar against other undervalued currencies. Rather than permitting a **clean float** (a market solution) to occur, foreign central banks refused to permit the dollar depreciation by intervening in the exchange market. The United States considered this a **dirty float** because the free market forces of supply and demand were not allowed to achieve their equilibrating role. A second motivation for guidelines was the concern that floats, over time, might lead to disorderly markets with erratic fluctuations in exchange rates. Such destabilizing activity could create an uncertain business climate and reduce the level of world trade.

Under managed floating, a nation can alter the degree that it intervenes in the foreign exchange market. Heavier intervention moves the nation nearer to a fixed exchange rate status, whereas less intervention moves the nation nearer to a floating exchange rate status. Concerning day-to-day and week-to-week exchange rate movements, a main objective of the floating guidelines has been to prevent the emergence of erratic fluctuations. Member nations should intervene in the foreign exchange market as necessary to prevent sharp and disruptive exchange rate fluctuations. Such a policy is known as **leaning against the wind**—intervening to reduce short-term fluctuations in exchange rates without attempting to adhere to any particular rate over the long run. Members should also not act aggressively with respect to their currency exchange rates; they should not enhance the value when it is appreciating or depress the value when it is depreciating.

Under the managed float, some nations choose **target exchange rates** and intervene to support them. Target exchange rates are intended to reflect long-term economic forces that underlie exchange rate movements. One way for managed floaters to estimate a target exchange rate is to follow statistical indicators that respond to the same economic forces as the exchange rate trend. When the values of indicators change, the exchange rate target can be adjusted accordingly. Among these indicators are rates of inflation in different nations, levels of official foreign reserves, and persistent imbalances in international payments accounts. In practice, defining a target exchange rate can be difficult in a market based on volatile economic conditions.

Managed Floating Rates in the Short Run and Long Run

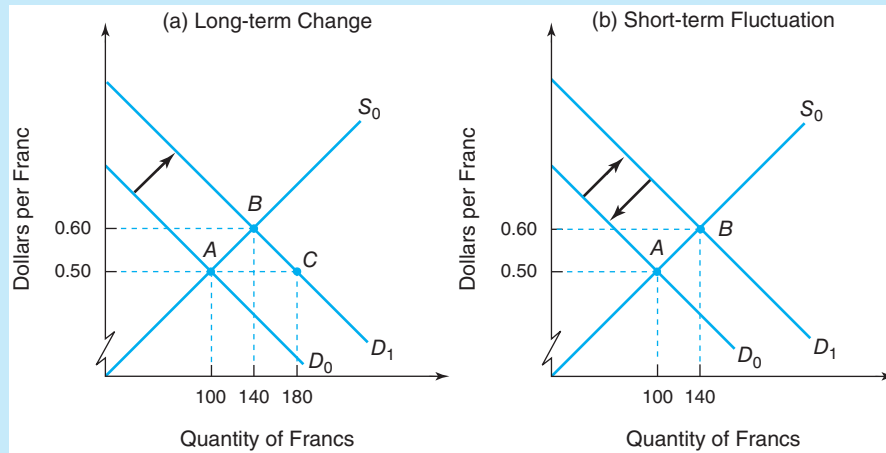
Managed floating exchange rates attempt to combine market-determined exchange rates with foreign exchange market intervention in order to take advantage of the best features of floating exchange rates and fixed exchange rates. Under a managed float, market intervention is used to stabilize exchange rates in the short run; in the long run, a managed float allows market forces to determine exchange rates.

Figure 14.4 illustrates the theory of a managed float in a two-country framework: Switzerland and the United States. The supply and demand schedules for francs are denoted by S_0 and D_0 ; the equilibrium exchange rate, when the quantity of francs supplied equals the quantity demanded, is \$0.50 per franc.

Suppose there occurs a permanent increase in U.S. real income as a result of U.S. residents demanding additional francs to purchase more Swiss chocolate. Let the demand for francs rise from D_0 to D_1 , as shown in Figure 14.4(a). Because this increase in demand is the result of long run market forces, a managed float permits supply and demand conditions to determine the exchange rate. With the increase in demand for francs, the quantity of francs demanded (180 francs) exceeds the quantity supplied (100 francs) at the exchange rate of \$0.50 per franc. The excess demand results in a rise in the exchange rate to \$0.60 per franc, when the quantity of francs supplied and the quantity demanded are equal. In this manner, long run movements in exchange rates are determined by the supply and demand for various currencies.

FIGURE 14.4

Managed Floating Exchange Rates



Under this system, central bank intervention is used to stabilize exchange rates in the short run; in the long run, market forces are permitted to determine exchange rates.

Figure 14.4(b) illustrates the case of a short-term increase in the demand for francs. Suppose U.S. investors demand additional francs to finance purchases of Swiss securities that pay relatively high interest rates; let the demand for francs rise from D_0 to D_1 . In a few weeks, assume Swiss interest rates fall, causing the U.S. demand for francs to revert to its original level, D_0 . Under floating rates, the dollar price of the franc would rise from \$0.50 per franc to \$0.60 per franc and then fall back to \$0.50 per franc. This type of exchange rate irascibility is widely considered to be a disadvantage of floating rates because it leads to uncertainty regarding the profitability of international trade and financial transactions; the pattern of trade and finance may be disrupted.

Under managed floating rates, the response to this temporary disturbance is exchange rate intervention by the Fed to keep the exchange rate at its long-term equilibrium level of \$0.50 per franc. During the time period when demand is at D_1 , the central bank will sell francs to meet the excess demand. As soon as the disturbance is over and demand reverts back to D_0 , exchange market intervention will no longer be needed. Central bank intervention is used to offset temporary fluctuations in exchange rates that contribute to uncertainty in carrying out transactions in international trade and finance.

Since the advent of managed floating rates in 1973, the frequency and size of U.S. foreign exchange interventions have varied. Intervention was substantial from 1977 to 1979 when the dollar's exchange value was considered to be unacceptably low. American stabilization operations were minimal during the Reagan administration's first term, consistent with its goal of limiting government interference in markets; they were directed at offsetting short run market disruptions. Intervention was again substantial in 1985, when the dollar's exchange value was deemed unacceptably high, hurting the competitiveness of U.S. producers. The most extensive U.S. intervention operations took place after the Louvre Accord of 1987 when the major industrial nations reached informal understandings about the limits of tolerance for exchange rate fluctuations.

Exchange Rate Stabilization and Monetary Policy

We have seen how central banks can buy and sell foreign currencies to stabilize their values under a system of managed floating exchange rates. Another stabilization technique involves a nation's *monetary policy*. As we shall see, stabilizing a currency's exchange value requires the central bank to adopt (1) an *expansionary* monetary policy to offset currency *appreciation*, and (2) a *contractionary* monetary policy to offset currency *depreciation*.

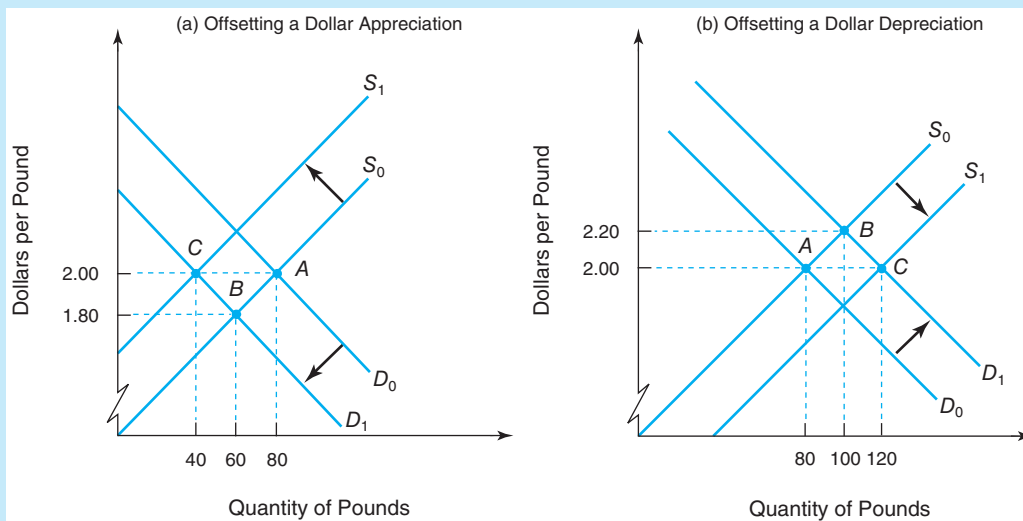
Figure 14.5 illustrates the foreign exchange market for the United States. Assume that the supply schedule of U.K. pounds is denoted by S_0 and the demand schedule of pounds is denoted by D_0 . The equilibrium exchange rate, when the quantity of pounds supplied and the quantity demanded are equalized, is \$2 per pound.

Suppose that as a result of production shutdowns in the United Kingdom caused by labor strikes, U.S. residents purchase fewer U.K. products and demand fewer pounds. Let the demand for pounds decrease from D_0 to D_1 , as shown in Figure 14.5(a). In the absence of central bank intervention, the dollar price of the pound falls from \$2 to \$1.80 so the dollar appreciates against the pound.

To offset the appreciation of the dollar, the Fed can increase the supply of money in the United States that will decrease domestic interest rates in the short run. The reduced interest rates will cause the foreign demand for U.S. securities to decline. Fewer pounds will be supplied to the foreign exchange market to buy dollars to purchase U.S. securities. As the supply of pounds shifts leftward to S_1 , the dollar's exchange value reverts to \$2 per pound. In this manner, the expansionary monetary policy has offset the dollar's appreciation.

FIGURE 14.5

Exchange Rate Stabilization and Monetary Policy



In the absence of international policy coordination, stabilizing a currency's exchange value requires a central bank to initiate (a) an expansionary monetary policy to offset an appreciation of its currency, and (b) a contractionary monetary policy to offset a depreciation of its currency.

Referring now to Figure 14.5(b), suppose a temporary surge in U.K. interest rates causes U.S. investors to demand additional pounds to purchase additional U.K. securities. Let the demand for pounds rise from D_0 to D_1 . In the absence of central bank intervention, the dollar's exchange value would rise from \$2 to \$2.20 per pound; the dollar has depreciated against the pound.

To offset this dollar depreciation, the Fed can decrease the supply of money in the United States that will increase domestic interest rates and attract U.K. investment. More pounds will be supplied to the foreign exchange market to purchase dollars to buy U.S. securities. As the supply of pounds increases from S_0 to S_1 , the dollar's exchange value reverts to \$2 per pound. The contractionary monetary policy helps offset the dollar depreciation.

These examples illustrate how domestic monetary policies can be used to stabilize currency values. Such policies are not without costs, as seen in the following example.

Suppose the U.S. government increases federal spending without a corresponding increase in taxes. To finance the resulting budget deficit, assume the government borrows funds from the money market that raises domestic interest rates. High U.S. interest rates enhance the attractiveness of dollar-denominated securities, leading to increased foreign purchases of these assets, an increased demand for dollars, and an appreciation in the dollar's exchange value. The appreciating dollar makes U.S. goods more expensive overseas and foreign goods less expensive in the United States, causing the U.S. trade account to fall into deficit.

Now assume that the Fed intervenes and adopts an expansionary monetary policy. The resulting increase in the supply of money dampens the rise in U.S. interest rates and the dollar's appreciation. By restraining the increase in the dollar's exchange value, the expansionary monetary policy enhances the competitiveness of U.S. businesses and keeps the U.S. trade account in balance.

However, the favorable effects of the expansionary monetary policy on the domestic economy are temporary. When pursued indefinitely (over the long run), a policy of increasing the domestic money supply leads to a *weakening* in the U.S. trade position because the monetary expansion required to offset the dollar's appreciation eventually promotes higher prices in the United States. The higher prices of domestic goods offset the benefits of U.S. competitiveness that initially occur under the monetary expansion. American spending eventually shifts back to foreign products and away from domestically produced goods causing the U.S. trade account to fall into deficit.

This example shows how monetary policy can be used to stabilize the dollar's exchange value in the short run. When monetary expansion occurs on a sustained, long run basis, it brings with it eventual price increases that nullify the initial gains in domestic competitiveness. The long run effectiveness of using monetary policy to stabilize the dollar's exchange value is limited because the increase in the money supply to offset the dollar's appreciation does not permanently correct the underlying cause of the trade deficit—the increase in domestic spending.

Attempting to stabilize both the domestic economy and the dollar's exchange value can be difficult for the Fed. In early 1995, the dollar was taking a nosedive against the yen and the U.S. economy showed signs of slowing. To boost the dollar's exchange value would have required the Fed to adopt a restrictive monetary policy that would have led to higher interest rates and net investment inflows. Further increases in domestic interest rates would heighten the danger that the U.S. economy would be pushed into a recession by the next year. The Fed had to choose between supporting domestic economic expansion or the dollar's exchange value. In this case, the Fed adopted a policy of lower interest rates, appearing to respond to U.S. domestic needs.

Is Exchange Rate Stabilization Effective?

Many governments have intervened in foreign exchange markets to try to dampen volatility and slow or reverse currency movements.³ Their concern is that excessive short-term volatility and longer-term swings in exchange rates that “overshoot” values justified by fundamental conditions may hurt their economies, particularly sectors heavily involved in international trade. The foreign exchange market can be volatile. One euro cost about \$1.15 in January 1999, then dropped to \$0.85 by the end of 2000, only to climb to over \$1.18 in June 2003. Over this same period, one U.S. dollar bought as much as 133 yen and as little as 102 yen, a 30 percent fluctuation. Many other currencies have also experienced large price swings in recent years.

Many central banks intervene in foreign exchange markets. The largest player is Japan. Between 1991 and 2000, the Bank of Japan bought U.S. dollars on 168 occasions for a cumulative amount of \$304 billion and sold U.S. dollars on 33 occasions for a cumulative amount of \$38 billion. The following describes a typical case: On April 3, 2000, the Bank of Japan purchased \$13.2 billion in the foreign exchange market in an attempt to stop the more than 4 percent depreciation of the dollar against the yen that had occurred during the previous week. Japan’s intervention magnitudes dwarf all other countries’ official intervention in the foreign exchange market. It exceeded U.S. intervention in the 1991–2000 period by a factor of more than 30. However, compared to overall market transactions in the foreign exchange market, the magnitude of Japan’s interventions has been quite small.

Not surprisingly, intervention supported by central bank interest rate changes tends to have an even larger impact on exchange rates than intervention alone. Cases where intervention was coordinated between two central banks, such as the Federal Reserve and the Bank of Japan, had a larger impact on exchange rates than unilateral foreign exchange operations. Episodes of coordinated intervention are rather rare.

Academic researchers have often questioned the usefulness of official foreign exchange intervention. Proponents of foreign exchange intervention note that it may be useful when the exchange rate is under speculative attack—when a change in the exchange rate is not justified by fundamentals. It may also be helpful in coordinating private sector expectations. Recent research provides some support for the short run effectiveness of intervention. This should not be interpreted as a rationale for intervention as a longer-term management tool.⁴

The Crawling Peg

Instead of adopting fixed or floating rates, why not try a compromise approach—the **crawling peg**. This system has been used by nations including Bolivia, Brazil, Costa Rica, Nicaragua, Solomon Islands, and Peru. The crawling peg system means that a nation makes small, frequent changes in the par value of its currency to correct a balance-of-payments disequilibrium. Deficit and surplus nations both keep adjusting until the desired exchange rate level is attained. The term *crawling peg* implies that par value changes are implemented in a large number of small steps, making the process of exchange rate adjustment continuous for all practical purposes. The peg crawls from one par value to another.

The crawling peg mechanism has been used primarily by nations having high inflation rates. Some developing nations, mostly South American, have recognized that a pegging

³This section is drawn from Michael Hutchinson, “Is Official Foreign Exchange Intervention Effective?” *Economic Letter*, Federal Reserve Bank of San Francisco, July 18, 2003.

⁴Michael Hutchinson, “Intervention and Exchange Rate Stabilization Policy in Developing Countries,” *International Finance* 6, 2003, pp. 41–59.

system can operate in an inflationary environment only if there is provision for frequent changes in the par values. Associating national inflation rates with international competitiveness, these nations have generally used price indicators as a basis for adjusting crawling pegged rates. In these nations, the primary concern is the criterion that governs exchange rate movements, rather than the currency or basket of currencies against which the peg is defined.

The crawling peg differs from the system of adjustable pegged rates. Under the adjustable peg, currencies are tied to a par value that changes infrequently (perhaps once every several years) but suddenly, usually in large jumps. The idea behind the crawling peg is that a nation can make small, frequent changes in par values, perhaps several times a year, so they creep along slowly in response to evolving market conditions.

Supporters of the crawling peg argue that the system combines the flexibility of floating rates with the stability usually associated with fixed rates. They contend that a system providing continuous, steady adjustments is more responsive to changing competitive conditions and avoids a main problem of adjustable pegged rates—that changes in par values are frequently wide of the mark. Moreover, small, frequent changes in par values made at random intervals frustrate speculators with their irregularity.

In recent years, the crawling peg formula has been used by developing nations facing rapid and persistent inflation. The IMF has generally contended that such a system would not be in the best interests of nations such as the United States or Germany that bear the responsibility for international currency levels. The IMF has felt that it would be hard to apply such a system to the industrialized nations whose currencies serve as a source of international liquidity. Although even the most ardent proponents of the crawling peg admit that the time for its widespread adoption has not yet come, the debate over its potential merits is bound to continue.

Currency Manipulation and Currency Wars

During the 2000s, accusations of currency manipulation have become widespread among world leaders. The United States has accused Japan, China, South Korea, Singapore, and other countries of keeping the exchange values of their currencies artificially low in order to boost international competitiveness and trade surpluses. These countries have retorted that the United States has been doing the same thing.

Currency manipulation is the purchase or the sale of a currency on the exchange market by the fiscal authority or the monetary authority, in order to influence the value of that currency. By selling yen and buying dollar-denominated Treasury securities, Japan can depreciate its yen against the dollar. Why? The sale of yen drives its price downward and the purchase of the dollar drives its price upward; thus, the yen depreciates against the dollar. For the United States, a depreciating yen means that Japanese goods are artificially cheaper in the United States and American goods are more expensive in Japan than they should be. U.S. exports to Japan decrease and U.S. imports from Japan increase. The lower value of the yen means that it is cheaper to hire Japanese workers and encourages American factories to move to Japan. This is bad for you if you work on a factory line in the United States and are trying to sell goods to Japan. A weak currency cheapens the price of a country's exports, making them more attractive to international buyers by undercutting competitors. This provides export-driven economies a leg up on their global competitors.

Artificially lowering a country's exchange rate causes problems for other countries because one currency can fall only if another rises. This imbalance could spark a currency war—a destabilizing battle in which countries compete against one another to get the lowest exchange rate. This is what occurred in the 1930s with disastrous consequences. As

countries abandoned the Gold Standard during the Great Depression, they used currency depreciations (devaluations) to stimulate their economies. Because this effectively pushed unemployment overseas, trading partners quickly retaliated with their own depreciations, resulting in a currency war, a collapse in international trade, and a contraction of the global economy.

The U.S. government has complained about being the victim of deliberate currency manipulation by its trading partners, especially China, who are trying to steal demand away from their American competitors. Bills in Congress have been proposed (though not passed) that would place sanctions on currency manipulators. Countervailing currency intervention could be enacted so that the United States would buy the currencies of currency manipulators in sufficient amounts to offset the impact on its own exchange rate: If China buys one billion dollars to keep the dollar artificially strong and its yuan artificially weak, the United States would buy one billion dollars' worth of Chinese yuan to offset the exchange rate impact. Another possible sanction is retaliatory tariffs that are placed on the exports of currency-manipulating countries.

However, other countries complain about the currency policy of the United States, as seen in the Fed's stimulation of the American economy during the Great Recession of 2007–2009 and its aftermath. The primary purpose of the Fed's policy was to grow the U.S. economy via an increase in the money supply, a reduction in the interest rate, and increases in investment spending. The policy also caused the dollar's exchange value to depreciate. How? As the Fed reduced the domestic interest rate, foreign investment in the United States contracted, the demand for the dollar declined, and the dollar's exchange value fell. The lower exchange rate is the byproduct of the expansionary monetary policy.

It is a tough call on what is and isn't an unacceptable currency policy. One is an economy in which the central bank increases the money supply to foster economic growth (think of the United States where the lower exchange rate is the byproduct of the expansionary monetary policy). The other is an economy in which the central bank actively intervenes in foreign exchange markets to depreciate its currency, boost exports, and steal demand from other countries (think of China where the lower exchange rate is the primary policy objective). Although we might judge the U.S. tactic to be acceptable and the Chinese tactic to be unacceptable, countries on the receiving end of currency manipulation understandably don't much care about the underlying motive; all they see is that their currency is appreciating and their exports and economic growth are threatened. However, the rationale matters. The world has suffered from inadequate aggregate demand and high unemployment in recent years. Worries about government debt burdens have led to reluctance to pursue expansionary fiscal policy (tax reductions and government spending increases) in the United States and Europe. Thus, there is more reliance on monetary policy.

In the next section, we will consider the currency manipulation conflict between the United States and China.

Is China a Currency Manipulator?

Trade tensions between the United States and China have run high in recent years. The United States has accused China of manipulating its yuan so as to harm the American economy, as seen in the following scenario.

China is selling more than it is buying, and it has a trade surplus. If foreign currency markets operate correctly, the yuan would appreciate because the world is buying yuan to buy China's goods, so its goods would begin to cost more. Also, the appreciating yuan would enable people in China to purchase more from the rest of the world. Thus, China should sell

less and buy more over time, bringing its trade account back into balance. Instead, suppose that China's central bank (the People's Bank of China) uses the surplus of incoming cash to buy the currency of other countries. This action bypasses the natural market supply and demand function of the currency market and forces the price of these currencies up, meaning that goods from those countries still cost more and goods from China still cost less. Therefore, China's trade surplus continues to increase rather than decrease. Business firms in other countries shut down, people in other countries lose their jobs, and the wealth of other countries shifts to China.

The United States has maintained that the above scenario applies to U.S.–China trade relations. As the argument goes, China's currency policy has resulted in its yuan being significantly undervalued relative to the dollar, giving the Chinese an unfair competitive advantage. An undervalued yuan makes U.S. exports to China more expensive than they would be if exchange rates were determined by market forces. This undervaluation harms U.S. production and employment in manufacturing industries such as textiles, apparel, and furniture that have to compete against artificially low-cost goods from China. An undervalued yuan also makes Chinese goods cheaper for American consumers, encouraging them to import more goods from China. As a result, China takes jobs away from Americans. If the dollar–yuan exchange rate was set by market forces instead of being manipulated by the People's Bank of China, the yuan would appreciate sharply, increasing the price of Chinese exports and taking pressure off U.S. manufacturing industries. China's huge trade surplus with the United States and its large accumulation of dollar reserves are cited as evidence that China has manipulated the value of its currency relative to the dollar for competitive advantage. For the sake of stability in the economies of the United States and China, and also the global economy, action needs to be taken to allow market forces to determine the dollar–yuan exchange rate.

However, other analysts contend that there is little or no connection between the yuan and the health of U.S. manufacturing. They note that the transition away from manufacturing in the United States is a long run trend that goes far beyond competition from Chinese exports. Jobs have been slashed because technological improvements have made each worker more productive. If the United States wants to make its workers more competitive with those in China, it should reform its educational system rather than rely on illusory gains from changes in exchange rates. Also, there may be a good economic rationale for China's desire to maintain a stable value against the dollar. As long as this fixed rate is credible, it serves as an effective monetary anchor for China's internal price level.

Some analysts contend that China's currency intervention yields positive results for the U.S. economy. China has maintained large investments in U.S. debt that helps keep U.S. interest rates low, allowing American firms to make investments that would be unattractive at a higher cost of borrowing. Such investments increase the amount of capital available and increase the size of the economy. An undervalued yuan also promotes a lower inflation rate in the United States. China argues that its currency peg policy is not intended to favor exports over imports, but rather to foster economic stability. Chinese officials note that many developing countries, including China, tie their currencies to the dollar at a fixed rate to promote economic stability. Chinese leaders fear that abandoning the peg could induce an economic crisis in China and especially damage its export sectors at a time when painful economic reforms, such as shutting down inefficient state-owned businesses and restructuring the banking system are being implemented. Chinese officials view economic stability as crucial to maintaining political stability. They are concerned that an appreciating yuan would reduce employment and decrease wages in several industries and thus cause worker unrest.

The U.S. Treasury Department meets twice a year to evaluate the currency policies of its major trading partners and to determine whether any of those countries is gaining an unfair trade advantage by weakening its currency. The Treasury Department says a country is a currency manipulator if it fulfills the following three requirements:

- The country's trade surplus with the United States is greater than \$20 billion.
- Its current account surplus is larger than 3 percent of its gross domestic product.
- It must consistently weaken its currency through repeated net purchases of foreign currency that total more than 2 percent of its gross domestic product over one year.

Applying these criteria to China, the Treasury Department found that in 2016 China met only one criteria of currency manipulation: China had a trade surplus totaling more than \$350 billion, much larger than the \$20 billion level that the Treasury Department considers significant. Yet China's current account surplus stood at only 2.4 percent of gross domestic product, less than the Treasury Department's threshold for currency manipulation. Also, China was doing less throughout 2016 to deliberately weaken its currency by buying up foreign currencies. In fact, the country was selling down its foreign-currency reserves to prevent an even deeper depreciation of the yuan against the dollar. By 2016, the Chinese economy was slowing, and Chinese firms and individuals were investing more heavily outside the country; as their money left China, it placed downward pressure on the yuan. The Treasury Department concluded that China was further from being a currency manipulator than Germany, Japan, Switzerland, South Korea, and Taiwan which met two of the currency-manipulation criteria in 2016. The Treasury Department has not declared China to be a currency manipulator since 1994.

If the Treasury Department declares that China is a currency manipulator, it is supposed to resolve the problem through negotiation. If those talks fail, the United States can retaliate by imposing restrictions on U.S. government-financed developmental programs in China and restrictions on U.S. government procurement opportunities with China. However, these remedies are of minor significance. Instead, the United States could file unfair trade complaints with the IMF and the World Trade Organization. However, the international economic system has been ineffective at responding to currency manipulation. Although the IMF has clear rules against competitive devaluations, it has no enforcement mechanism and its decision-making process is highly politicized and easy for manipulators to block. The World Trade Organization can levy tough sanctions, but its rules on exchange rates are vague and have never been tested.

So what else might the United States do to prevent currency manipulation? There are several possibilities:

- The U.S. Commerce Department could designate the practice of currency manipulation as an unfair subsidy when employed by a country such as China. U.S. companies would then be in a position to bring antisubsidy actions against China on particular products to the U.S. Department of Commerce. But before countervailing duties would be levied on these products, the U.S. International Trade Commission would have to designate that currency manipulation caused material injury to American firms and workers. This could be difficult to show if the American industry was booming anyway. Also, this practice is bound to be controversial because it may violate World Trade Organization rules. Other countries might take similar measures against American exports and could argue that Federal Reserve policies that weaken the dollar qualify as subsidies.
- A much broader trade response would be for the United States to impose across-the-board import surcharges, covering all or most imports, against all countries deemed to be currency manipulators. However, import surcharges are legal under the rules of

the World Trade Organization only for a country that has a major balance-of-payments deficit as certified by the International Monetary Fund. Any surcharge would have to be applied equally against all U.S. trading partners on a nondiscriminatory basis.

- Concerning future trade agreements that the United States might initiate, a clause could be added that would prevent participating nations from engaging in currency manipulation. The penalty for violating the requirement would be loss of the benefits conferred by the agreement on that nation.

At the writing of this text, none of these remedies were being used. Therefore, designation as a currency manipulator was mostly symbolic. It remains to be seen how the currency manipulation issue will play out.⁵

Currency Crises

A shortcoming of the international monetary system is that major currency crises have been a common occurrence in recent years. A **currency crisis**, also called a **speculative attack**, is a situation in which a weak currency experiences heavy selling pressure. There are several possible indications of selling pressure. One is sizable losses in the foreign reserves held by a country's central bank. Another is depreciating exchange rates in the forward market where buyers and sellers promise to exchange currency at some future date rather than immediately. In extreme cases where inflation is running rampant, selling pressure consists of widespread flight out of domestic currency into foreign currency or into goods that people think will retain value, such as gold or real estate. Experience shows that currency crises can decrease the growth of a country's gross domestic product by 6 percent or more. That is like losing one or two years of economic growth in most countries.

A currency crisis ends when selling pressure stops. One way to end pressure is to devalue; establish a new exchange rate at a sufficiently depreciated level. Mexico's central bank might stop exchanging pesos for dollars at the previous rate of 10 pesos per dollar and set a new level of 20 pesos per dollar. Another way to end selling pressure is to adopt a floating exchange rate. Floating permits the exchange rate to "find its own level," which is almost always depreciated compared to the previous pegged rate. Devaluation and allowing depreciation make foreign currency and foreign goods more costly in terms of domestic currency, which tends to decrease demand for foreign currency, ending the imbalance that triggered selling pressure. In some cases, especially when confidence in the currency is low, the crisis continues and further rounds of devaluation or depreciation occur.

Currency crises that end in devaluations or accelerated depreciations are sometimes called **currency crashes**. Not all crises end in crashes. A way of trying to end the selling pressure of a crisis without suffering a crash is to impose restrictions on the ability of people to buy and sell foreign currency. These controls create profit opportunities for people who discover how to evade them, so over time controls lose effectiveness unless enforced by an intrusive bureaucracy. Another way to end selling pressure is to obtain a loan to bolster the foreign reserves of the monetary authority. Countries that wish to bolster their foreign reserves often ask the IMF for loans. Although the loan can help temporarily, it may just delay rather than end selling pressure. The final way to end selling pressure is to restore confidence in the existing exchange rate, such as announcing appropriate and credible changes in monetary policy.

⁵For the current status of currency manipulation, see *Foreign Exchange Policies of Major Trading Partners of the United States*, U.S. Department of the Treasury, Office of International Affairs, October 14, 2016. This report is updated twice a year.

INTERNATIONAL FINANCE APPLICATION

The Global Financial Crisis of 2007–2009

Economic crises tend to occur sporadically virtually every decade and in various countries ranging from Sweden to Argentina, from Russia to Korea, and from Japan to the United States. Each crisis is unique, yet each bears some resemblance to others. In general, economic crises have been caused by factors such as an overshooting of markets, excessive leveraging of debt, credit booms, miscalculations of risk, rapid outflows of capital from a country, and unsustainable macroeconomic policies.

Concerning the global economic crisis of 2007–2009, what began as a bursting of the U.S. housing market bubble and an increase in foreclosures ballooned into a global financial and economic crisis. Some of the largest and most venerable banks, investment houses, and insurance companies either declared bankruptcy or had to be rescued financially. In the automobile industry, General Motors and Chrysler declared bankruptcy and were nationalized by the U.S. government. Many blamed the United States for the crisis and saw it as an example of the excesses of a country that did not practice sound principles of finance.

The global economic crisis brought home an important point: The United States is a major center of the financial world. Regional financial crises, such as the Asian financial crisis of 1997–1998, can occur without seriously infecting the rest of the global financial system. When the U.S. financial system stumbles, it tends to bring major parts of the rest of the world down with it. The reason is that the United States is the main guarantor of the international financial system, the provider of dollars widely used as currency reserves and as an international medium of exchange, and a contributor to much of the financial capital that sloshes around the world seeking higher yields. The rest of the world may not appreciate it, but a financial crisis in the United States often takes on a global aspect.

The financial crisis that began in the United States quickly spread to other industrial countries and also to emerging market and developing economies. Investors pulled capital from countries, even those with small levels of perceived risk, and caused values of stocks and domestic currencies to plunge. Slumping exports and commodity prices added to the woes, pushing economies worldwide into either recession or a period of slow



economic growth. As economies throughout the world deteriorated, it became clear that the United States and other countries could not export their way out of recession: There was no major economy that could play the role of an economic engine to pull other countries out of their economic doldrums.

The global crisis played out at two levels. The first was among the industrialized nations of the world where most of the losses from subprime mortgage debt, excessive leveraging of investments, and inadequate capital backing financial institutions have occurred. The second level of the crisis was among emerging market and other economies who were innocent bystanders to the crisis but who had weak economies that could be whipsawed by activities in global markets. These nations had insufficient sources of capital and had to turn to help from the International Monetary Fund, World Bank, and capital surplus nations such as Japan.

To cope with the global financial crisis, the United States and other countries attempted to control the contagion, minimize losses to society, restore confidence in financial institutions and instruments, and lubricate the wheels of the economy in order for it to return to full operation. To achieve these goals, countries such as the United States, China, South Korea, Spain, Sweden, and Germany enacted a variety of measures such as:

- Injecting capital through loans or stock purchases to prevent bankruptcy of financial institutions.
- Increasing deposit insurance limits in order to limit withdrawals from banks.
- Purchasing toxic debt of financial institutions on the verge of failure so that they would start lending again.
- Coordinating interest rate reductions by central banks to inject liquidity into the economy.
- Enacting stimulative fiscal policies to bolster sagging aggregate demand.

At the G-20 Summit on Financial Markets and the World Economy in November of 2008, participating countries generally recognized that economic crisis was not merely an aberration that could be fixed by tweaking the system: There appeared to be no international mechanism capable of coping with and preventing global crises from erupting. The countries concluded that major changes are

(continued)

needed in the global financial system to reduce risk, provide oversight, and establish an early warning system of impending financial crises. Needed reforms will be successful only if they are grounded in a commitment to free market principles. The extent to which the United States and other countries are willing to alter their financial systems remains to be seen.

What do you think? Does the global financial crisis of 2007–2009 illustrate the economics of interdependence?

Source: Dick Nanto, *The Global Financial Crisis: Analysis and Policy Implications*, April 3, 2009, Congressional Research Service, U.S. Library of Congress, U.S. Government Printing Office, Washington, DC.

Sources of Currency Crises

Why do currency crises occur?⁶ A popular explanation is that big currency speculators instigate the crises for their own profit. The world's best-known currency speculator, George Soros, made \$2 billion in 1992 by speculating against European currencies. Speculation can also result in substantial losses. George Soros retired in 2000 after suffering the effects of losing almost \$2 billion as the result of unsuccessful speculations. Currency speculation is not just an activity of big speculators. Millions of ordinary people also speculate in the form of holding foreign currency in their wallets, under their mattresses, and the like. Millions of small speculators can move markets like the big speculators do. Currency crises are not simply caused by big currency speculators who appear out of nowhere. There must be an underlying reason for a currency crisis to occur.

One source for a currency crisis is budget deficits financed by inflation. If the government cannot easily finance its budget deficits by raising taxes or borrowing, it may pressure the central bank to finance them by creating money. Creating money can increase the supply of money faster than demand is growing, causing inflation. Budget deficits financed by inflation seemed to capture the essentials of many currency crises up through the 1980s. By the 1990s, however, this explanation appeared to be lacking. During the currency crises in Europe in 1992–1993, budget deficits in most adversely affected countries were small and sustainable. Most East Asian countries affected by the currency crisis of 1997–1998 were running budget surpluses and realizing strong economic growth. Economists have looked for other explanations for currency crises.

Currency crises may also be caused by weak financial systems. Weak banks can trigger speculative attacks if people think the central bank will rescue the banks even at the cost of spending much of its foreign reserves to do so. The explicit or implicit promise to rescue the banks is a form of moral hazard—a situation in which people do not pay the full cost of their own mistakes. As people become apprehensive about the future value of the local currency, they sell it to obtain more stable foreign currencies.

Some of the major currency crises of the last 20 years have occurred in countries that had recently deregulated their financial systems. Many governments formerly used financial regulations to channel investment into politically favored outlets. In return, they restricted competition among banks, life insurance companies, and the like. Profits from restricted competition subsidized unprofitable government-directed investments. Deregulation altered the picture by reducing the government direction of investments and allowing more competition among institutions. Governments failed to ensure that in the new environment of greater freedom to reap the rewards of success, financial institutions also bore greater responsibility for failure. Financial institutions made mistakes in the unfamiliar

⁶Kurt Schuler, *Why Currency Crises Happen*, Joint Economic Committee, U.S. Congress, January 2002.

environment of deregulation, failed, and were rescued at public expense. This rescue resulted in public fears about the future value of the local currency and the selling of it to obtain more stable foreign currencies.

A weak economy can trigger a currency crisis by creating doubt about the determination of the government and the central bank to continue with the current monetary policy if weakness continues. A weak economy is characterized by falling gross domestic product (GDP) growth per person, a rising unemployment rate, a falling stock market, and falling export growth. If the public expects the central bank to increase the money supply to stimulate the economy, it may become apprehensive about the future value of the local currency and begin selling it on currency markets.

Political factors can also cause currency crises. Developing countries have historically been more prone to currency crises than developed countries because they tend to have a weaker rule of law, governments more prone to being overthrown by force, central banks that are not politically independent, and other characteristics that create political uncertainty about monetary policy.

External factors can be another source for a currency crisis. An increase in interest rates in major international currencies can trigger a currency crisis if a central bank resists increasing the interest rate it charges. Funds may flow out of the local currency into foreign currency, decreasing the central bank's reserves to unacceptably low levels and therefore putting pressure on the government to devalue its currency if the currency is pegged. Moreover, a big external shock that disrupts the economy, such as war or a spike in the price of imported oil, can likewise trigger a currency crisis. External shocks have been key features in many currency crises historically.

The choice of an exchange rate system also affects whether and how currency crises occur. In recent years, fixing the value of the domestic currency to that of a large, low-inflation country has become popular. Fixing the value helps keep inflation under control by linking the inflation rate for internationally traded goods to that found in the anchor country. Prior to 2002, the exchange rate for the Argentine peso was pegged at one peso per U.S. dollar. Therefore, a bushel of corn sold on the world market at \$4 had its price set at 4 pesos. If the public expects this exchange rate to be unchangeable, then the fixed rate has the extra advantage of anchoring inflation expectations for Argentina to the inflation rate in the United States, a relatively low-inflation country.

Despite the advantage of promoting relatively low inflation, a fixed exchange rate system makes countries vulnerable to speculative attacks on their currencies. Recall that preservation of fixed exchange rates requires the government to purchase or sell domestic currency for foreign currency at the target rate of exchange. This requirement forces the central bank to maintain a sufficient quantity of international reserves in order to fulfill the demand by the public to sell domestic currency for foreign currency at the fixed exchange rate. If the public thinks that the central bank's supply of international reserves has decreased to the level where the ability to fulfill the demand to sell domestic currency for foreign currency at a fixed exchange rate is doubted, then a devaluation of the domestic currency is anticipated. This anticipation can result in a speculative attack on the central bank's remaining holdings of international reserves. The attack consists of huge sales of domestic currency for foreign currency so that the decrease in international reserves is expedited, and devaluation results from the decline in reserves. It is no wonder that the most important recent currency crises have happened to countries having fixed exchange rates but demonstrating a lack of political will to correct previous economic problems.

Next, we will examine how the speculative attacks on East Asian currencies contributed to a major currency crisis.

Speculators Attack East Asian Currencies

After more than a decade of maintaining the Thai *baht's* peg to the U.S. dollar, Thai authorities abandoned the peg in July 1997.⁷ By October, market forces had led the baht to depreciate by 60 percent against the dollar. The depreciation triggered a wave of speculation against other Southeast Asian currencies. Over the same period, the Indonesian *rupiah*, Malaysian *ringgit*, Philippine peso, and South Korean won abandoned links to the dollar and depreciated 47, 35, 34, and 16 percent, respectively. This episode reopened one of the oldest debates in economics: whether a currency should have a fixed or floating exchange rate. Consider the case of Thailand.

Although Thailand was widely regarded as one of Southeast Asia's outstanding performers throughout the 1980s and 1990s, it relied heavily on inflows of short-term foreign capital, attracted both by the stable baht and by Thai interest rates that were much higher than comparable interest rates elsewhere. The capital inflow supported a broad-based economic boom that was especially visible in the real estate market.

However, by 1996, Thailand's economic boom had fizzled. As a result, both local and foreign investors grew nervous and began withdrawing funds from Thailand's financial system, which put downward pressure on the baht. However, the Thai government resisted the depreciation pressure by purchasing baht with dollars in the foreign exchange market and also raising interest rates, which increased the attractiveness of the baht. The purchases of the baht greatly depleted Thailand's reserves of hard currency. Raising interest rates adversely affected an already weak financial sector by dampening economic activity. These factors ultimately contributed to the abandonment of the baht's link to the dollar.

Although Thailand and other Southeast Asian countries abandoned fixed exchange rates in 1997, some economists questioned whether such a policy would be in their best interest in the long run. Their reasoning was that these economies were relatively small and wide open to international trade and investment flows. Inflation rates were modest by the standards of a developing country and labor markets were relatively flexible. Floating exchange rates were probably not the best long run option. These economists maintained that unless the Southeast Asian governments anchored their currencies to something, their currencies might drift into a vicious cycle of depreciation and higher inflation. There was certainly a concern that central banks in the region lacked the credibility to enforce tough monetary policies without the external constraint of a fixed exchange rate. Neither fixed exchange rates nor floating exchange rates offer a magical solution. What really makes a difference to a country's prospects is the quality of its overall economic policies.

Capital Controls

Because capital flows have often been an important element in currency crises, controls on capital movements have been established to support fixed exchange rates and thus avoid speculative attacks on currencies. **Capital controls**, also known as **exchange controls**, are government-imposed barriers to foreign savers investing in domestic assets (government securities, stock, or bank deposits) or to domestic savers investing in foreign assets. At one extreme, a government may seek to gain control over its payments position by directly circumventing market forces through the imposition of direct controls on international

⁷Ramon Moreno, "Lessons from Thailand," *Economic Letter*, Federal Reserve Bank of San Francisco, November 7, 1997.

transactions. A government that has a virtual monopoly over foreign exchange dealings may require that all foreign exchange earnings be turned over to authorized dealers. The government then allocates foreign exchange among domestic traders and investors at government-set prices.

The advantage of such a system is that the government can influence its payments position by regulating the amount of foreign exchange allocated to imports or capital outflows, limiting the extent of these transactions. Capital controls also permit the government to encourage or discourage certain transactions by offering different rates for foreign currency for different purposes. Capital controls can give domestic monetary and fiscal policies greater freedom in their stabilization roles. By controlling the balance-of-payments through capital controls, a government can pursue its domestic economic policies without fear of balance-of-payments repercussions.

Speculative attacks in Mexico and East Asia were fueled in part by large changes in capital outflows and inflows. As a result, some economists and politicians argued for restrictions on capital mobility in developing countries. Malaysian Prime Minister Mahathir imposed limits on capital outflows in 1998 to help his economy regain financial stability.

Although restrictions on capital outflows may seem attractive, they suffer from several problems. Evidence suggests that capital outflows may further increase after the controls are implemented because confidence in the government is weakened. Restrictions on capital outflows often result in evasion, as government officials get paid to ignore domestic residents who shift funds overseas. Capital controls may provide government officials the false sense of security that they do not have to reform their financial systems to ameliorate the crisis.

Although economists are generally dubious of controls on capital outflows, controls on capital inflows often receive more support. Supporters contend that if speculative capital cannot enter a country, then it cannot suddenly leave and create a crisis. They note that the financial crisis in East Asia in 1997–1998 illustrated how capital inflows can result in a lending boom, excessive risk taking by domestic banks, and ultimately financial collapse. Restrictions on the inflow of capital are problematic because they can prevent funds that would be used to finance productive investment opportunities from entering a country. Limits on capital inflows are seldom effective because the private sector finds ways to evade them and move funds into the country.⁸

Should Foreign Exchange Transactions Be Taxed?

The 1997–1998 financial crises in East Asia, in which several nations were forced to abandon their fixed exchange rate regimes, produced demands for more stability and government regulation in the foreign exchange markets. Market volatility was blamed for much of the trouble sweeping the region.

Economists generally argue that the free market is the best device for determining how money should be invested. Global capital markets provide needy countries with funds to grow while permitting foreign investors to diversify their portfolios. If capital is allowed to flow freely, they contend markets will reward countries that pursue sound economic policies and pressure the rest to do the same. Most countries welcome and even encourage capital inflows such as foreign direct investment in factories and businesses that represent long-lasting commitments. Some have become skeptical of financial instruments such as stocks and bonds, bank deposits, and short-term debt securities that can be pulled out of a

⁸Sebastian Edwards, “How Effective Are Capital Controls?” *Journal of Economic Perspective*, Winter 2000, Vol. 13, No. 4, pp. 65–84.

country with a stroke of a computer key. That's what occurred in East Asia in 1997, in Mexico in 1994 and 1995, and in the United Kingdom and Italy in 1992 and 1993.

To prevent international financial crises, several notable economists have called for sand to be thrown in the wheels of international finance by imposing a tax on foreign exchange transactions. The idea is that a tax would increase the cost of these transactions, which would discourage massive responses to minor changes in information about the economic situation and dampen volatility in exchange rates. Proponents argue that such a tax would give traders an incentive to look at long-term economic trends, not short-term hunches when buying and selling foreign exchange and securities. Traders would pay a small tax, say, 0.1 percent for every transaction, so they would not buy or sell unless expected returns justified the additional expense. Fewer transactions suggest less volatility and more stable exchange rates.

Proponents of a tax may well contend that they are not trying to interfere with free markets, but only to prevent excess volatility. We do not know how much volatility is excessive or irrational. It's true that economists cannot explain all exchange rate volatility in terms of changes in the economic fundamentals of nations, but it does not follow from this that we should seek to regulate such fluctuations. Indeed, some of the volatility may be produced by uncertainty about government policies.

There are other drawbacks to the idea of taxing foreign exchange transactions. Such a tax could impose a burden on countries that are quite rationally borrowing overseas. By raising the cost of capital for these countries, it would discourage investment and hinder their development. A tax on foreign exchange transactions would be difficult to implement. Foreign exchange trading can be conducted almost anywhere in the world, and a universal agreement to impose such a tax seems extremely unlikely. Those countries that refused to implement the tax would become centers for foreign exchange trading.

Increasing the Credibility of Fixed Exchange Rates

As we have learned, when speculators feel that a central bank is unable to defend the exchange rate for a weakening currency, they will sell the local currency to obtain more stable foreign currencies. Are there ways to convince speculators that the exchange rate is unchangeable? Currency boards and dollarization are explicitly intended to maintain fixed exchange rates and thus prevent currency crises.

Currency Board

A **currency board** is a monetary authority that issues notes and coins convertible into a foreign anchor currency at a *fixed* exchange rate. The anchor currency is a currency chosen for its expected stability and international acceptability. For most currency boards, the U.S. dollar or the U.K. pound has been the anchor currency. A few currency boards have used gold as the anchor. Usually the fixed exchange rate is set by law, making changes to the exchange rate costly for governments. Currency boards offer the strongest form of a fixed exchange rate that is possible short of full currency union.

The commitment to exchange domestic currency for foreign currency at a fixed exchange rate requires the currency board have sufficient foreign exchange to honor this commitment. This condition means that its holdings of foreign exchange must at least equal 100 percent of its notes and coins in circulation as set by law. A currency board can operate in place of a central bank or as a parallel issuer alongside an existing central bank. Usually a currency board takes over the role of a central bank in strengthening the currency of a developing country.

By design, a currency board has no discretionary powers. Its operations are completely passive and automatic. The sole function of a currency board is to exchange its notes and

coins for the anchor at a fixed rate. Unlike a central bank, a currency board does not lend to the domestic government, domestic companies, or domestic banks. In a currency board system, the government can finance its spending only by taxing or borrowing, not by printing money and creating inflation. This limitation results from the stipulation that the backing of the domestic currency must be at least 100 percent.

A country that adopts a currency board puts its monetary policy on autopilot. It is as if the chairman of the board of governors of the Federal Reserve System were replaced by a personal computer. When the anchor currency flows in, the board issues more domestic currency and interest rates fall; when the anchor currency flows out, interest rates rise. The government sits back and watches, even if interest rates skyrocket and a recession ensues.

Many economists maintain that, especially in the developing world, central banks are incapable of retaining nonpolitical independence and instill less confidence than is necessary for the smooth functioning of a monetary system. They are answerable to the prerogatives of populism or dictatorship and are at the beck and call of political changes. The bottom line is that central banks should not be given the onerous responsibility of maintaining the value of currencies. This job should be left to an independent body whose sole mandate is to issue currency against a strict and unalterable set of guidelines that require a fixed amount of foreign exchange or gold to be deposited for each unit of domestic currency issued.

Currency boards can confer considerable credibility on fixed exchange rate regimes. The most vital contribution a currency board can make to exchange rate stability is imposing discipline on the process of money creation. This discipline results in the greater stability of domestic prices that in turn stabilizes the value of the domestic currency. In short, the major benefits of the currency board system are as follows:

- Making a nation's currency and exchange rate regimes more rule bound and predictable
- Placing an upper bound on the nation's base money supply
- Arresting any tendencies in an economy toward inflation
- Forcing the government to restrict its borrowing to what foreign and domestic lenders are willing to lend it at market interest rates
- Engendering confidence in the soundness of the nation's money, assuring citizens and foreign investors that the domestic currency can always be exchanged for some other strong currency
- Creating confidence and promoting trade, investment, and economic growth

Proponents cite Hong Kong as a country that has benefited from a currency board. In the early 1980s, Hong Kong had a floating exchange rate. The immediate cause of Hong Kong's economic problems was uncertainty about its political future. In 1982, the United Kingdom and China began talks about the fate of Hong Kong when the United Kingdom's lease on the territory expired in 1997. Fear that China would abandon Hong Kong's capitalist system sent Hong Kong's stock market down by 50 percent. Hong Kong's real estate market weakened also, and small banks with heavy exposure in real estate suffered runs. The result was a 16 percent depreciation in the Hong Kong dollar against the U.S. dollar. With this loss of confidence, many merchants refused to accept Hong Kong dollars and quoted prices in U.S. dollars instead. Panic buying of vegetable oil, rice, and other staples emptied merchants' shelves.

In 1983, the government of Hong Kong ended its economic crises by announcing that Hong Kong would adopt a currency board system. It pegged its exchange rate at HK \$7.8 = US\$1. The currency reform immediately reversed the loss of confidence about

Hong Kong's economy despite continuing troubles in the U.K.–China discussions. A stable currency provided the basis for Hong Kong to continue its rapid economic growth.

By maintaining a legal commitment to exchange domestic currency for a foreign currency at a fixed exchange rate and a commitment to issue currency only if it is backed by foreign reserves, a currency board can be a good way to restore confidence in a country gripped by economic chaos. Although a currency board cannot solve all of a country's economic problems, it may achieve more financial credibility than a domestic central bank.

Although currency boards help discipline government spending, thereby reducing a major source of inflation in developing countries, there are concerns about currency boards. Perhaps the most common objection is that a currency board prevents a country from pursuing a discretionary monetary policy and thus reduces its economic independence. It is sometimes said that a currency board system is susceptible to financial panics because it lacks a lender of last resort. Another objection is that a currency board system creates a colonial relation with the anchor currency. Critics cite the experiences of British colonies that operated under currency board systems in the early 1900s.

It is possible for a nation's monetary system to be orderly and disciplined under either a currency board or a central banking system. Neither system by itself guarantees either order or discipline. The effectiveness of both systems depends on other factors such as fiscal discipline and a sound banking system. In other words, it is a whole network of responsible and mutually supporting policies and institutions that make for sound money and stable exchange rates. No monetary regime, however well-conceived, can bear the entire burden alone.

For Argentina, No Panacea in a Currency Board

For much of the post–World War II era, when the financial press focused on Argentina, it was to highlight bouts of high inflation and failed stabilization efforts. Hyperinflation was rampant in the 1970s and 1980s, and prices increased by more than 1,000 percent in both 1989 and 1990.

In 1991, to tame its tendency to finance public spending by printing pesos, Argentina introduced convertibility of its peso into dollars at a fixed one-to-one exchange rate. To control the issuance of money, the Argentines abandoned their central bank–based monetary regime that they felt lacked credibility and established a currency board. Under this arrangement, currency could be issued only if the currency board had an equivalent amount of dollars.

The fixed exchange rate and the currency board were designed to ensure that Argentina would have a low inflation rate, one similar to that in the United States. At first, this program appeared to work: By 1995, prices were rising at less than 2 percent per year.

During the late 1990s, the Argentine economy was hit with four external shocks: the appreciation of the dollar that had the same negative effect on Argentine export- and import-competing industries that it had on similar industries in the United States; rising U.S. interest rates that spilled over into the Argentine economy, resulting in a decrease in spending on capital goods; falling commodity prices on world markets that significantly harmed Argentina's commodity exporting industries; and the depreciation of Brazil's *real* that made Brazil's goods relatively cheaper in Argentina and Argentina's goods relatively more expensive in Brazil. These external shocks had a major deflationary effect on the Argentine economy, resulting in falling output and rising unemployment.

Argentina dealt with its problems by spending much more than it collected in taxes to bolster its economy. To finance its budget deficits, Argentina borrowed dollars on the

international market. When further borrowing became impossible in 2001, Argentina defaulted, ended convertibility of pesos into dollars, and froze most deposits at banks. Violence and other protests erupted as Argentines voiced their displeasure with politicians.

Some economists have questioned whether the establishment of a currency board was a mistake for Argentina. They note that although Argentina tied itself to the American currency area as if it were Utah or Massachusetts, it did not benefit from adjustment mechanisms that enable the American currency area to work smoothly in the face of negative external shocks. When unemployment rose in Argentina, its people could not move to the United States where jobs were relatively plentiful. Federal Reserve policy was geared to the conditions of the United States rather than to Argentina. The U.S. Congress did not target American fiscal policy on problem areas in Argentina. As a result, the negative shocks to the Argentine economy were dealt with by wage and price deflation. It was a consequence of having fixed its currency rigidly to the dollar.

INTERNATIONAL FINANCE APPLICATION

Swiss Franc Soars after Exchange Rate Anchor Scrapped

When monetary policies diverge, it becomes difficult to maintain a pegged exchange rate. Consider the case of the Swiss franc and the euro. In January 2015, Switzerland shocked the foreign exchange market by terminating a crucial part of its effort to hold down the value of its franc against the euro, concluding that the strategy was too risky and costly given the substantial forces that were pushing the franc in the opposite direction. How did this come about?

During the height of the European debt crisis in 2011, investors and savers dumped the depreciating euro in favor of the Swiss franc, which was viewed as a safe haven. As investors and savers purchased francs with euros on the open market, the franc's exchange value rapidly appreciated against the euro. Swiss monetary authorities saw that the rise in the value of the franc was causing problems for Swiss exporting companies, which suddenly found that their exports were becoming less competitive in foreign markets. So the monetary authorities took action to try to keep the euro from depreciating against the franc (the franc from appreciating against the euro): They set an exchange rate floor of 1.2 francs per euro. To defend this floor, the central bank of Switzerland purchased euros with francs on the open market as the euro approached the floor.

Although this policy initially seemed to work, by January 2015, the Swiss monetary authorities realized that intervening in the foreign exchange market to stabilize the euro was becoming very difficult. Why? The European Central Bank announced that it was about to implement

an expansionary monetary policy (quantitative easing) that would reduce interest rates so as to pump prime the weak economies of the euro zone. However, falling interest rates would result in net investment outflows for the euro zone countries, which would place further downward pressure on the euro's exchange value against the franc. This would require the Swiss central bank to purchase sizable quantities of euros to defend the exchange rate floor. Viewing this action to be too costly, the Swiss monetary authorities abandoned their effort to defend the exchange rate floor. The move came as a complete surprise as the monetary authorities gave no prior warning about the policy.

Switzerland's move to abandon the exchange rate floor sent the euro plummeting a stunning 30 percent against the franc before it recovered somewhat. This ended more than three years of stability in Swiss foreign exchange markets. As the franc skyrocketed against the euro, the competitiveness of Swiss exporters declined, at least for those exports going to the eurozone.

The January 2015 appreciation in the Swiss franc was the biggest move in the modern history of developed-market currencies. It jolted money managers, central bankers, and corporate treasurers around the world. It also resulted in sizable losses for many foreign exchange market traders, who borrow heavily to fund risky bets.

What do you think? Why is it difficult to maintain pegged exchange rates when monetary policies diverge among nations?



Dollarization

Instead of using a currency board to maintain fixed exchange rates, why not “dollarize” an economy? **Dollarization** occurs when residents of, say, Ecuador, use the U.S. dollar alongside or instead of the *sucre*. Partial dollarization occurs when Ecuadoreans hold dollar-denominated bank deposits or Federal Reserve notes to protect against high inflation in the *sucre*. Partial dollarization has existed for years in many Latin American and Caribbean countries where the United States is a major trading partner and a major source of foreign investment.

Full dollarization means the elimination of the Ecuadorean *sucre* and its complete replacement with the U.S. dollar. The monetary base of Ecuador, which initially consisted entirely of *sucre*-denominated currency, would be converted into U.S. Federal Reserve notes. To replace its currency, Ecuador would sell foreign reserves (mostly U.S. Treasury securities) to buy dollars and exchange all outstanding *sucre* notes for dollar notes. The U.S. dollar would be the sole legal tender and sole unit of account in Ecuador. Full dollarization has occurred in the U.S. Virgin Islands, the Marshall Islands, Puerto Rico, Guam, Ecuador, and other Latin American countries.

Full dollarization is rare today because of the symbolism countries attach to a national currency and the political impact of a perceived loss of sovereignty associated with the adoption of another country's unit of account and currency. When it does occur, it is principally implemented by small countries or territories that are closely associated politically, geographically, and/or through extensive economic and trade ties with the country whose currency is adopted.

Why Dollarize? Why would a small country want to dollarize its economy? Benefits to the dollarizing country include the credibility and policy discipline that is derived from the implicit irrevocability of dollarization. Behind this lies the promise of lower interest and inflation rates, greater financial stability, and increased economic activity. Countries with a history of high inflation and financial instability often find the potential offered by dollarization to be quite attractive. Dollarization is considered to be one way of avoiding the capital outflows that often precede or accompany an embattled currency situation.

A major benefit of dollarization is the decrease in transaction costs as a result of a common currency. The elimination of currency risk and hedging allows for more trade and more investment within the unified currency zone to occur. Another benefit is in the area of inflation. The choice of another currency necessarily means that the rate of inflation in the dollarized economy will be tied to that of the issuing country. To the extent that a more accepted, stable, recognized currency is chosen, lower inflation now and in the future can be expected to result from dollarization. Greater openness results from a system where exchange controls are unnecessary and balance-of-payments crises are minimized. Dollarization will not assure an absence of balance-of-payments difficulties, but it does ensure that such crises will be handled in a way that forces a government to deal with events in an open manner, rather than by printing money and contributing to inflation.

Effects of Dollarization A convenient way to think about any country that plans to adopt the dollar as its official currency is to treat it as one would treat any of the 50 states in the United States. In discussions about monetary policy in the United States, it is assumed that the Fed conducts monetary policy with reference to national economic conditions rather than the economic conditions in an individual state or region, even though economic conditions are not uniform throughout the country. The reason for this is that monetary policy works through interest rates on credit markets that are national in scope. Monetary policy cannot be tailored to deal with business conditions in an individual state or region that is different from the national economy. When Ecuador dollarized its economy, it essentially accepted the monetary policy of the Fed.

With dollarization in Ecuador, U.S. monetary policy would presumably be carried out as it is now. If Ecuadorean business cycles do not coincide with those in the United States, Ecuador cannot count on the Fed to come to its rescue, just as any state in the United States cannot count on the Fed to rescue them. This limitation may be a major downside for the Ecuadoreans. Despite this, Ecuador might still be better off without the supposed safety valve of an independent monetary policy.

Another limitation facing the Ecuadoreans is that the Fed is not their lender of last resort as it is for Americans. If the U.S. financial system should come under stress, the Fed could use its various monetary powers to aid these institutions and contain possible failures. Without the consent of the U.S. Congress, the Fed could not perform this function for Ecuador or for any other country that decided to adopt the dollar officially as its currency.

A third limitation arising from the adoption of the dollar as the official currency is that Ecuador could no longer get any **seigniorage** from its monetary system. This cost for Ecuador stems from the loss of the foreign reserves (mainly U.S. Treasury securities) that it can sell in exchange for dollars. These reserves bear interest and, therefore, are a source of income for Ecuador. This income is called seigniorage. Once Ecuador's reserves are replaced by dollar bills, this source of income disappears.

With dollarization, Ecuador enjoys the same freedom that the 50 states in the United States enjoy as to how to spend its tax dollars. Ecuador state expenditures for education, police protection, social insurance, and the like are not affected by its use of the U.S. dollar. Ecuador can establish its own tariffs, subsidies, and other trade policies. Ecuador's sovereignty is not compromised in these areas. There would be an overall constraint on Ecuadorean fiscal policy: Ecuador does not have the recourse of printing more sucre to finance budget deficits and thus has to exercise caution in its spending policies.

Official dollarization of Ecuador's economy also has implications for the United States. First, when Ecuadoreans acquire dollars they surrender goods and services to Americans. For each dollar sent abroad, Americans enjoy a one-time increase in the amount of goods and services they are able to consume. Second, by opting to hold dollars rather than the interest-bearing debt of the United States, the United States, in effect, gets an interest-free loan from Ecuador. The interest that does not have to be paid is a measure of seigniorage that accrues on an annual basis to the United States. On the other hand, use of U.S. currency abroad might hinder the formulation and execution of monetary policy by the Fed. By making Ecuador more dependent on U.S. monetary policy, dollarization could result in more pressure on the Fed to conduct policy according to the interests of Ecuador rather than those of the United States.

SUMMARY

1. Most nations maintain neither completely fixed nor floating exchange rates. Contemporary exchange rate systems generally embody some features of each of these standards.
2. Small, developing nations often anchor their currencies to a single currency or a currency basket. Anchoring to a single currency is generally used by small nations whose trade and financial relations are mainly with a single trading partner. Small nations with more than one major trading partner often anchor their currencies to a basket of currencies.
3. The special drawing right is a currency basket composed of the four key currencies of IMF members. The basket valuation technique attempts to make

- the SDR's value more stable than the foreign currency value of any single currency in the basket. Developing nations often choose to anchor their exchange rates to the SDR.
4. Under a fixed exchange rate system, a government defines the official exchange rate for its currency. It then establishes an exchange stabilization fund that buys and sells foreign currencies to prevent the market exchange rate from moving above or below the official rate. Nations may officially devalue/revalue their currencies to restore trade equilibrium.
 5. With floating exchange rates, market forces of supply and demand determine currency values. Among the major arguments for floating rates are (a) simplicity, (b) continuous adjustment, (c) independent domestic policies, and (d) reduced need for international reserves. Arguments against floating rates stress (a) disorderly exchange markets, (b) reckless financial policies on the part of governments, and (c) conduciveness to price inflation.
 6. With the breakdown of the Bretton Woods system of fixed exchange rates, major industrial nations adopted a system of managed floating exchange rates. Under this system, central bank intervention in the foreign exchange market is intended to prevent disorderly market conditions in the short run. In the long run, exchange rates are permitted to float in accordance with changing supply and demand.
 7. To offset a depreciation in the home currency's exchange value, a central bank can (a) use its international reserves to purchase quantities of that currency on the foreign exchange market; or (b) initiate a contractionary monetary policy that leads to higher domestic interest rates, increased investment inflows, and increased demand for the home currency. To offset an appreciation in the home currency's exchange value, a central bank can sell additional quantities of its currency on the foreign exchange market or initiate an expansionary monetary policy.
 8. Under a crawling peg exchange rate system, a nation makes frequent devaluations (or revaluations) of its currency to restore payments balance. Developing nations suffering from high inflation rates have been major users of this mechanism.
 9. A currency crisis, also called a *speculative attack*, is a situation in which a weak currency experiences heavy selling pressure. Among the causes of currency crises are budget deficits financed by inflation, weak financial systems, political uncertainty, and changes in interest rates on world markets. Although a fixed exchange rate system has the advantage of promoting low inflation, it is especially vulnerable to speculative attacks.
 10. Capital controls are sometimes used by governments in an attempt to support fixed exchange rates and prevent speculative attacks on currencies. Capital controls are hindered by the private sector's finding ways to evade them and move funds into or out of a country.
 11. Currency boards and dollarization are explicitly intended to maintain fixed exchange rates and prevent currency crises. A currency board is a monetary authority that issues notes and coins convertible into a foreign currency at a fixed exchange rate. The most vital contribution a currency board can make to exchange rate stability is to impose discipline on the process of money creation. This discipline results in greater stability in domestic prices, which, in turn, stabilizes the value of the domestic currency. Dollarization occurs when residents of a country use the U.S. dollar alongside or instead of their own currency. Dollarization is seen as a way to protect a country's growth and prosperity from bouts of inflation, currency depreciation, and speculative attacks against the local currency.

KEY CONCEPTS AND TERMS

Adjustable pegged exchange rates (p. 468)	Dirty float (p. 472)	Leaning against the wind (p. 472)
Bretton Woods system (p. 467)	Dollarization (p. 491)	Managed floating system (p. 471)
Capital controls (p. 485)	Exchange controls (p. 485)	Official exchange rate (p. 464)
Clean float (p. 472)	Exchange stabilization fund (p. 465)	Par value (p. 464)
Crawling peg (p. 476)	Fixed exchange rates (p. 462)	Revaluation (p. 466)
Currency board (p. 487)	Floating exchange rates (p. 468)	Seigniorage (p. 492)
Currency crashes (p. 481)	Fundamental disequilibrium (p. 465)	Special drawing right (SDR) (p. 464)
Currency crisis (p. 481)	Impossible trinity (p. 461)	Speculative attack (p. 481)
Devaluation (p. 466)	Key currency (p. 462)	Target exchange rates (p. 472)

STUDY QUESTIONS

1. What factors underlie a nation's decision to adopt floating exchange rates or fixed exchange rates?
2. How do managed floating exchange rates operate? Why were they adopted by the industrialized nations in 1973?
3. Why do some developing countries adopt currency boards? Why do others dollarize their monetary systems?
4. Discuss the philosophy and operation of the Bretton Woods system of adjustable pegged exchange rates.
5. Why do nations use a crawling peg exchange rate system?
6. What is the purpose of capital controls?
7. What factors contribute to currency crises?
8. Why do small nations adopt currency baskets against which they peg their exchange rates?
9. What advantage does the SDR offer to small nations seeking to peg their exchange rates?
10. Present the case for and the case against a system of floating exchange rates.
11. What techniques can a central bank use to stabilize the exchange value of its currency?
12. What is the purpose of a currency devaluation? What about a currency revaluation?

CHAPTER 15

Macroeconomic Policy in an Open Economy



Since the Great Depression of the 1930s, governments have actively pursued the goal of a fully employed economy with price stability. They have used fiscal and monetary policies to achieve this goal. A nation that has a closed economy (one that is not exposed to international trade and financial flows) could use these policies in view of its own goals. With an open economy, the nation finds that the success of these policies depends on factors such as its exports and imports of goods and services, the international mobility of financial capital, and the flexibility of its exchange rate. These factors can support or detract from the ability of monetary and fiscal policy to achieve full employment with price stability.

This chapter considers macroeconomic policy in an open economy. The chapter first examines the way in which monetary and fiscal policy are supposed to operate in a closed economy. The chapter then describes the effect of an open economy on monetary and fiscal policy. More can be learned about the international banking system by going to *Exploring Further 15.1*, “International Banking: Reserves, Debt, and Risk,” which may be accessed in MindTap.

Economic Objectives of Nations

What are the objectives of macroeconomic policy? Known as **internal balance**, this goal has two dimensions: a fully employed economy and no inflation—or more realistically, a reasonable amount of inflation. Nations traditionally have considered internal balance to be of primary importance and formulated economic policies to attain this goal. Policy makers are also aware of a nation’s current account position. A nation is said to be in **external balance** when it realizes neither deficits nor surpluses in its current account. An economy realizes **overall balance** when it attains internal balance and external balance.

Besides pursuing internal and external balance, nations have other economic goals such as long run economic growth and a reasonably equitable distribution of national income. Although these and other commitments may influence macroeconomic policy, the discussion in this chapter is confined to the pursuit of internal and external balance.

Policy Instruments

To attain external and internal balance, policy makers enact expenditure changing policies, expenditure switching policies, and direct controls.

Expenditure changing policies alter the level of total spending (aggregate demand) for goods and services, including those produced domestically and those imported. They include **fiscal policy**, which refers to changes in government spending and taxes, and **monetary policy**, which refers to changes in the money supply and interest rates by a nation's central bank (such as the Federal Reserve). Depending on the direction of change, expenditure changing policies are either expenditure increasing or reducing.

Expenditure switching policies modify the direction of demand, shifting it between domestic output and imports. Under a system of fixed exchange rates, a nation with a trade deficit could devalue its currency to increase the international competitiveness of its firms, thus diverting spending from foreign-produced goods to domestically produced goods. To increase its competitiveness under a managed floating exchange rate system, a nation could purchase other currencies with its currency causing its currency's exchange value to depreciate. The success of these policies in promoting trade balance largely depends on switching demand in the proper direction and amount, as well as on the capacity of the home economy to meet the additional demand by supplying more goods.

Direct controls consist of government restrictions on the market economy. They are selective expenditure switching policies whose objective is to control particular items in the current account. Direct controls such as tariffs are levied on imports in an attempt to switch domestic spending away from foreign-produced goods to domestically produced goods. Direct controls may also be used to restrain capital outflows or to stimulate capital inflows.

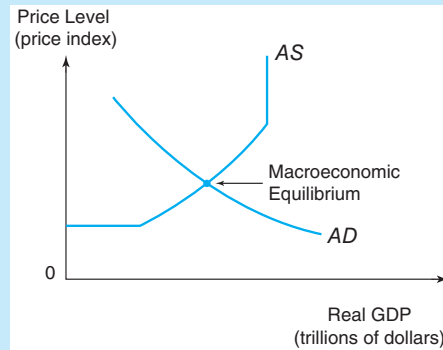
The formation of macroeconomic policy is subject to constraints that involve considerations of fairness and equity. Policy makers are aware of the needs of groups they represent such as labor and business, especially when pursuing conflicting economic objectives. To what extent should the domestic interest rate rise in order to eliminate a deficit in the capital account? The outcry of adversely affected groups within the nation that suffer from a high interest rate may be more than sufficient to convince policy makers not to pursue capital account balance. Reflecting perceptions of fairness and equity, policy formation tends to be characterized by negotiation and compromise.

Aggregate Demand and Aggregate Supply: A Brief Review

In your principles of macroeconomics course, you learned about a model that can be used to analyze the output and price level of an economy in the short run. This model is called the aggregate demand–aggregate supply model. Using the framework of Figure 15.1, let us review the main characteristics of this model as applied to Canada.

In Figure 15.1, the aggregate demand curve (*AD*) shows the level of real output (real gross domestic product [GDP]) that Canadians will purchase at alternative price levels during a given year. Aggregate demand consists of spending by domestic consumers, businesses, government, and foreign buyers (net exports). As the price level falls, the quantity of real output demanded increases.

Figure 15.1 also shows the economy's aggregate supply curve (*AS*). This curve shows the relation between the level of prices and amount of real output that will be produced by the economy during a given year. The aggregate supply curve is generally upward sloping because per-unit production costs, and therefore the prices that firms must receive, increase

FIGURE 15.1**Macroeconomic Equilibrium: The Aggregate Demand–Aggregate Supply Model**

The economy is in equilibrium where the aggregate demand curve intersects the aggregate supply curve. This intersection determines the equilibrium price level and output for the economy. Increases (decreases) in aggregate demand or aggregate supply result in rightward (leftward) shifts in these curves.

as real output increases.¹ The economy is in equilibrium when aggregate demand equals aggregate supply. This is where the two lines intersect in the figure.

An increase (decrease) in aggregate demand is depicted by a rightward (leftward) shift in the aggregate demand curve. Shifts in aggregate demand are caused by changes in the determinants of aggregate demand: consumption, investment, government purchases, or net exports. Similarly, an increase (decrease) in aggregate supply is depicted by a rightward (leftward) shift in the aggregate supply curve. Shifts in the aggregate supply curve occur in response to changes in the price of resources, technology, business expectations, and the like. Next, we will use the aggregate demand–aggregate supply framework to analyze the effects of fiscal and monetary policy.

Monetary and Fiscal Policies in a Closed Economy

Monetary policy and fiscal policy are the main macroeconomic tools by which government can influence the performance of an economy. If aggregate output is too low and unemployment is too high, the traditional policy solution is for government to increase aggregate demand for real output through expansionary monetary or fiscal policies. This results in an increase in the country's real GDP. Conversely, if inflation is troublesome, its source tends to be a level of aggregate demand that exceeds the rate of output that can be supported by

¹The aggregate supply curve actually has three distinct regions. First, when the economy is in deep recession or depression, the aggregate supply curve is horizontal. Because excess capacity in the economy places no upward pressure on prices, changes in aggregate demand cause changes in real output, but no change in the price level. Second, as the economy approaches full employment, scarcities in resource markets develop. Increasing aggregate demand places upward pressure on resource prices, bidding up unit production costs and causing the aggregate supply curve to slope upward: More output is produced only at a higher price level. Finally, the aggregate supply curve becomes vertical when the economy is at full employment.

the economy's resources at constant prices. The solution in this situation is for the government to reduce the level of aggregate demand through contractionary monetary or fiscal policy. As the aggregate demand curve decreases, the upward pressure on prices caused by excess aggregate demand is softened and inflation moderates.

Figure 15.2(a) illustrates the effects of an expansionary monetary or fiscal policy in a closed Canadian economy. For simplicity, let us assume that Canada's aggregate supply curve is horizontal until the full employment level of real GDP is attained at \$800 trillion; at this point, the aggregate supply curve becomes vertical. Also assume that the economy's equilibrium real GDP equals \$500 trillion, shown by the intersection of AD_0 and AS_0 . The economy suffers from recession because its equilibrium output lies below the full employment level. To combat the recession, assume that an expansionary monetary or fiscal policy is implemented that increases aggregate demand to AD_1 . Equilibrium real GDP would increase from \$500 trillion to \$700 trillion and unemployment would decline in the economy.

To expand aggregate demand, the Bank of Canada (as well as central banks of other countries) would usually increase the money supply through purchasing securities in the open market.² Increasing the money supply reduces the interest rate within the country and this increases consumption and investment spending. The resulting increase in aggregate demand generates a multiple increase in real GDP.³ To offset inflation, the Bank of Canada would decrease the money supply by selling securities in the open market, and the interest rate would rise. The increase in the interest rate reduces consumption and investment spending, thus decreasing aggregate demand. This decrease lowers any excess demand pressure on prices.

Instead of using monetary policy to stabilize the economy, Canada could use fiscal policy that operates either through changes in government spending or taxes. Because government spending is a component of aggregate demand, the Canadian government can directly affect aggregate demand by altering its own spending. To combat recession, the government could increase its spending to raise aggregate demand that results in a multiple increase in equilibrium real GDP. Instead, the government could combat recession by lowering income taxes that would increase the amount of disposable income in the hands of households. This increase results in a rise in consumption spending, an increase in aggregate demand, and a multiple increase in equilibrium real GDP. A contractionary fiscal policy works in the opposite direction.

Monetary and Fiscal Policies in an Open Economy

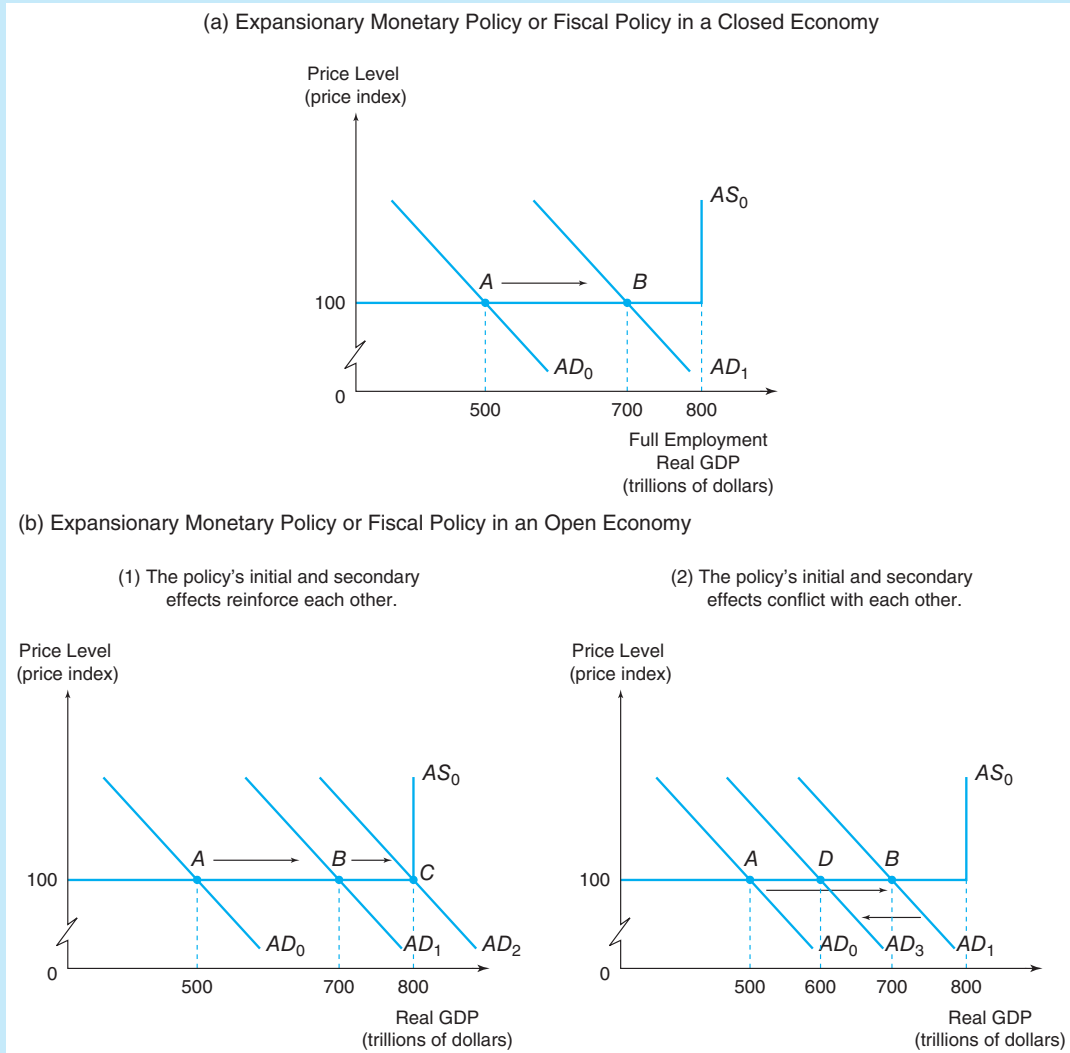
The previous section examined how monetary and fiscal policies can be used as economic stabilization tools in a closed economy. Next we consider the effects of these policies in an open economy. The key question is whether an expansionary monetary policy or fiscal

²Open market operations are the most important monetary tool of the Federal Reserve (Fed). They consist of the purchase or sale of securities by the Fed; this transaction is made with a bank or some other business or individual. Open market purchases result in an increase in bank reserves and the money supply. Open market sales cause bank reserves and the money supply to decrease. Other tools of monetary policy include changes in the discount rate, the interest rate that the Fed charges banks to borrow reserves, and changes in the required reserve ratio, the percentage of their deposits that banks are required to hold as reserves.

³Fiscal and monetary policies are based on the multiplier effect. According to this principle, changes in aggregate demand are multiplied into larger changes in equilibrium output and income. This process results from households receiving income and then spending it, which generates income for others, and so on.

FIGURE 15.2

Effect of an Expansionary Monetary or Fiscal Policy on Equilibrium Real GDP



(a) Expansionary monetary policy or fiscal policy in a closed economy. (b) Expansionary monetary policy or fiscal policy in an open economy. (1) The policy's initial and secondary effects reinforce each other. (2) The policy's initial and secondary effects conflict with each other.

policy in an open economy is more or less effective in increasing real GDP than it is in a closed economy.⁴

The answer to this question is influenced by a country's decision to adopt a system of fixed or floating exchange rates, as discussed below. In practice, many countries maintain neither rigidly fixed exchange rates nor freely floating exchange rates. Rather, they maintain

⁴This chapter considers solely the effects of expansionary monetary and fiscal policy. A contractionary monetary and fiscal policy tends to have the opposite effects.

managed floating exchange rates in which a central bank buys or sells currencies in an attempt to prevent exchange rate movements from becoming disorderly. Heavier exchange rate intervention moves a country closer to our fixed exchange rate conclusion for monetary and fiscal policies; less intervention moves a country closer to our floating exchange rate conclusion.

Our conclusions depend on the expansionary or contractionary effects that monetary policy or fiscal policy has on aggregate demand. In a closed economy, an expansionary monetary or fiscal policy has a single effect on aggregate demand: It causes aggregate demand to expand by increasing domestic consumption, investment, or government spending. In an open economy, the policy has a second effect on aggregate demand: It causes aggregate demand to increase or decrease by changing net exports and other determinants of aggregate demand. If the initial and secondary effects of the policy result in increases in aggregate demand, the expansionary effect of the policy is strengthened. If the initial and secondary effects have conflicting impacts on aggregate demand, the expansionary effect of the policy is weakened. The examples below clarify this point.

Let us begin by assuming that the mobility of international investment (capital) is high for Canada. This high mobility suggests that a small change in the relative interest rate across nations induces a large international flow of investment. This assumption is consistent with investment movements among many nations, such as the United States, Japan, and Germany, and the conclusions of many analysts that investment mobility increases as national financial markets become globalized.

Effect of Fiscal and Monetary Policies under Fixed Exchange Rates

Consider first the effects of an expansionary fiscal policy or monetary policy under a system of fixed exchange rates. The conclusion that emerges from our discussion is that an expansionary fiscal policy is more successful in stimulating the economy, and an expansionary monetary policy is less successful, than they are in a closed economy. This conclusion is summarized in Table 15.1.

TABLE 15.1

The Effectiveness of Monetary and Fiscal Policy in Promoting Internal Balance for an Economy with a High Degree of Capital Mobility

Exchange-Rate Regime	Monetary Policy	Fiscal Policy
Floating exchange rates	Strengthened	Weakened
Fixed exchange rates	Weakened	Strengthened

Fiscal Policy Is Strengthened under Fixed Exchange Rates Referring to Figure 15.2 (b-1), assume that Canada operates under a fixed exchange rate system and its government initially has a balanced budget in which government spending equals government taxes. To combat a recession, suppose the government adopts an expansionary fiscal policy, say, an increase in its spending on goods and services. The initial effect of a rise in government spending is to increase aggregate demand from AD_0 to AD_1 , the same amount that occurs in our example of expansionary fiscal policy in a closed economy. This increase causes equilibrium real GDP to expand from \$500 trillion to \$700 trillion.

The second effect of the expansionary fiscal policy is that increased spending causes the Canadian government's budget to go into deficit. As the government demands more money to finance its excess spending, the domestic interest rate rises. A higher interest rate attracts

an inflow of investment from foreigners that results in an increased demand for Canadian dollars in the foreign exchange market. The dollar's exchange rate is under pressure to appreciate. Appreciation cannot occur because Canada has a fixed exchange rate system. To prevent its dollar from appreciating, the Canadian government must intervene in the foreign exchange market and purchase foreign currency with dollars. This purchase results in an increase in the domestic money supply. The effect of the rise in the money supply is to increase the amount of loanable funds available in the economy. As these funds are channeled into domestic spending, aggregate demand increases again, from AD_1 to AD_2 , and equilibrium real GDP increases to \$800 trillion.

Because the initial and secondary effects of the expansionary fiscal policy reinforce each other, real GDP increases by a greater amount than in the example of expansionary fiscal policy in a closed economy. The effect of an expansionary fiscal policy is more pronounced in an economy with capital mobility and fixed exchange rates than it is in a closed economy.

Monetary Policy Is Weakened under Fixed Exchange Rates Contrast this outcome with monetary policy. As we will learn, in an open economy with capital mobility and fixed exchange rates, an expansionary monetary policy is less effective in increasing real GDP than it is in a closed economy.

Referring to Figure 15.2(b-2), assume that Canada suffers from recession. To combat the recession, suppose the Bank of Canada implements an expansionary monetary policy. The initial effect of the monetary expansion is to reduce the domestic interest rate, resulting in increased consumption and investment that expand aggregate demand from AD_0 to AD_1 . This expansion causes equilibrium real GDP to rise from \$500 trillion to \$700 trillion.

The second effect of the monetary expansion is that a lower Canadian interest rate discourages foreign investors from placing their funds in Canadian capital markets. As the demand for Canadian dollars decreases, its exchange value is under pressure to depreciate. To maintain a fixed exchange rate, the Bank of Canada intervenes in the foreign exchange market and purchases dollars with foreign currency. This purchase causes the domestic money supply to decrease as well as the availability of loanable funds in the economy. The resulting decrease in domestic spending leads to a decrease in aggregate demand from AD_1 to AD_2 that causes equilibrium real GDP to decline from \$700 trillion to \$600 trillion. This contraction in aggregate demand counteracts the initial expansion that was intended to stimulate the economy. An expansionary monetary policy is weakened when its initial and secondary effects conflict with each other. Under a system of fixed exchange rates and capital mobility, monetary policy is less effective in stimulating the economy than it is in a closed economy.

Effect of Fiscal and Monetary Policies under Floating Exchange Rates

We will now modify our example by replacing Canada's fixed exchange rate system with a system of floating exchange rates. The conclusion that emerges from this discussion is that with high capital mobility and floating exchange rates, an expansionary monetary policy is more successful in stimulating the economy, and an expansionary fiscal policy is less successful than they are in a closed economy.

Monetary Policy Is Strengthened under Floating Exchange Rates Again assume that Canada suffers from recession. To stimulate its economy, suppose the Bank of Canada adopts an expansionary monetary policy. As in a closed economy, an increase in the supply of money results in a lower domestic interest rate that initially generates more spending on consumption and investment and causes aggregate demand to increase. Referring to Figure 15.2(b-1), as aggregate demand increases from AD_0 to AD_1 , equilibrium real GDP rises from \$500 trillion to \$700 trillion.

The second effect of the expansionary monetary policy is that because investment is highly mobile between countries, the decreasing Canadian interest rate induces investors to place their funds in foreign capital markets. As Canadian investors sell dollars to purchase foreign currency used to facilitate foreign investments, the dollar depreciates. This depreciation results in an increase in exports, a decrease in imports, and an improvement in Canada's current account. The improving current account provides an extra boost to aggregate demand that expands from AD_1 to AD_2 . This expansion causes equilibrium real GDP to increase from \$700 trillion to \$800 trillion.

Because the initial and secondary effects of the expansionary monetary policy are complementary, the policy is strengthened by increasing Canada's output and employment. In an economy with capital mobility and floating exchange rates, an expansionary monetary policy is more effective in stimulating the economy than it is in a closed economy.

Fiscal Policy Is Weakened under Floating Exchange Rates The result is different if the Canadian government uses fiscal policy to combat recession. Referring to Figure 15.2(b-2), the initial effect of a rise in government spending is to increase aggregate demand from AD_0 to AD_1 , which causes equilibrium real GDP to increase from \$500 trillion to \$700 trillion. As the increased government spending causes the government's budget to go into deficit, the Canadian interest rate rises. A higher interest rate causes an inflow of investment from foreigners, which results in an increase in the demand for Canadian dollars in the foreign exchange market. The exchange value of the dollar thus appreciates, which results in falling exports, rising imports, and a deterioration of Canada's current account. As the current account worsens, aggregate demand decreases from AD_1 to AD_3 and equilibrium real GDP contracts from \$700 trillion to \$600 trillion. Because the initial and secondary effects of the fiscal policy are conflicting, the policy's expansionary effect is weakened. Therefore, an expansionary fiscal policy in an economy with capital mobility and floating exchange rates is less effective in stimulating the economy than it is in a closed economy.

INTERNATIONAL FINANCE APPLICATION

Monetary and Fiscal Policies Respond to Financial Turmoil in the Economy

Following six consecutive years of expansion, the U.S. economy peaked in December, 2007, beginning a recession that continued throughout 2008 and 2009. This was triggered by breakdowns in key credit markets that posed great risk to the financial system and the broader economy.

The Federal Reserve responded with unprecedented measures to unplug credit markets and free up the financial flows vital to a well-functioning economy. Besides lowering the federal funds rate target to virtually zero, the Federal Reserve expanded its role as lender of last resort by providing credit to banks and other financial institutions as well as businesses that were unable to secure adequate credit accommodations from banking institutions.

To provide additional stimulus to the weakening economy, the U.S. government enacted the Economic



Stimulus Act of 2008. The act was designed to provide temporary (one-time) tax rebates to those lower- and middle-income individuals and households who would immediately spend it. About \$113 billion was dispensed, which amounted to about 0.8 percent of GDP. The government hoped the tax rebates would burn such a hole in peoples' pockets that they would not be able

to resist spending it, therefore adding to aggregate demand. This optimism was unwarranted. It turned out that only 10–20 percent of the tax rebate dollars were spent: Most of the money went into household saving or to paying down past debt such as credit card bills, neither of which directly expanded the economy.

When Barack Obama became president in 2009, he inherited an economy that was falling deeper into

(continued)

recession. Obama noted that decreases in consumption and investment spending continued to drag the economy downward. The result was a fiscal stimulus program of \$789 billion, the most expansive unleashing of the government's fiscal firepower in the face of a recession since World War II. The stimulus included \$507 billion in spending programs and \$282 billion in tax relief, designed to increase aggregate demand: If more goods and services are being bought, whether

cement for a new highway or groceries paid for with a household tax cut, there is less chance of decreasing demand resulting in companies laying off workers, which would result in greater declines in demand and a deeper downturn.

What do you think? Does the U.S. government have enough ammunition to combat a future economic downturn?

Source: Economic Report of the President, 2009, 2010.

Macroeconomic Stability and the Current Account: Policy Agreement versus Policy Conflict

So far we have assumed that the goal of fiscal and monetary policies is to promote internal balance in Canada—that is, full employment without inflation. Besides desiring internal balance, suppose that Canadians want their economy to achieve current account (external) balance whereby its exports equal its imports. This balance suggests that Canada prefers to “finance its own way” in international trade by earning from its exports an amount of money necessary to pay for its imports. Will Canadian policy makers be able to achieve both internal and external balance at the same time, or will conflict develop between these two objectives?

Again let's assume that the Canadian economy suffers from recession. Suppose Canada's current account realizes a deficit in which imports exceed exports. Given a system of floating exchange rates, recall that an expansionary monetary policy for Canada results in a depreciation of its dollar and therefore an increase in its exports and a decrease in its imports. This rise in net exports serves to reduce the deficit in Canada's current account. The conclusion is that an expansionary monetary policy that is appropriate for combating Canada's recession is also compatible with the objective of reducing Canada's current account deficit. A single economic policy promotes overall balance for Canada.

Instead let's assume that Canada suffers from inflation and a current account deficit. When adopting a contractionary monetary policy to combat inflation, the Bank of Canada causes the domestic interest rate to increase, which results in an appreciation of its dollar. This appreciation results in a fall in Canada's exports, a rise in its imports, and a larger current account deficit. The conclusion is that Canada's contractionary monetary policy to combat inflation conflicts with its objective of promoting balance in its current account. Policy conflict prevails for the monetary policy. When Canada finds itself in a policy conflict zone, monetary policy (or fiscal policy) alone will not restore both internal and external balance. It is left for more advanced texts to further analyze this topic.

Inflation with Unemployment

This analysis so far has looked at the economy under special circumstances. It has been assumed that as the economy advances to full employment, domestic prices remain unchanged until full employment is reached. Once the nation's capacity to produce has been achieved, further increases in aggregate demand pull prices upward. This type of inflation is known as **demand-pull inflation**. Under these conditions, internal balance

(full employment with stable prices) can be viewed as a single target that requires but one policy instrument: a reduction in aggregate demand via monetary policy or fiscal policy.

A more troublesome problem is the appropriate policy to implement when a nation experiences *inflation with unemployment*. Here the problem is that internal balance cannot be achieved just by manipulating aggregate demand. To decrease inflation, a reduction in aggregate demand is required; to decrease unemployment, an expansion in aggregate demand is required. The objectives of full employment and stable prices cannot be considered as one and the same target; they are two independent targets, requiring two distinct policy instruments.

Achieving overall balance involves three separate targets: current account equilibrium, full employment, and price stability. To ensure all three objectives can be achieved simultaneously, monetary and fiscal policy may not be enough; direct controls may also be needed.

Inflation with unemployment has been a problem for the United States. In 1971 the U.S. economy experienced inflation with recession and a current account deficit. Increasing aggregate demand to achieve full employment would presumably intensify inflationary pressures. The president implemented a comprehensive system of **wage and price controls** to remove the inflationary constraint. Later the same year, the United States entered into exchange rate realignments that resulted in a depreciation of the dollar's exchange value by 12 percent against the trade-weighted value of other major currencies. The dollar depreciation was intended to help the United States reverse its current account deficit. It was the president's view that the internal and external problems of the United States could not be eliminated through expenditure changing policies alone.

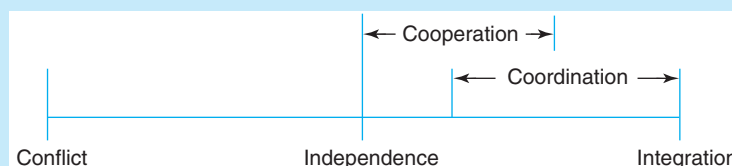
International Economic Policy Coordination

Policy makers have long been aware that the welfare of their economies is linked to that of the world economy. Because of the international mobility of goods, services, capital, and labor, economic policies of one nation have spillover effects on others. Recognizing these spillover effects, governments have often made attempts to coordinate their economic policies.

Economic relations among nations can be visualized along a spectrum, illustrated in Figure 15.3, ranging from open *conflict* to *integration*, where nations implement policies jointly in a supranational forum to which they have ceded a large degree of authority, such as the European Union. At the spectrum's midpoint lies policy *independence*: Nations take the actions of other nations as a given; they do not attempt to influence those actions or be influenced by them. Between independence and integration lie various forms of policy coordination and cooperation.

FIGURE 15.3

Relations among National Governments



Relations among national governments can be visualized along a spectrum ranging from policy conflict to policy integration. Between these extremes are a variety of forms of cooperation and coordination.

Cooperative policy making can take many forms, but in general, it occurs whenever officials from different nations meet to evaluate world economic conditions. During these meetings, policy makers may present briefings on their individual economies and discuss current policies. Such meetings represent a simple form of cooperation. A more involved format might consist of economists' studies on a particular subject, combined with an in-depth discussion of possible solutions. True policy coordination goes beyond these two forms of cooperation; policy coordination is a formal agreement among nations to initiate particular policies.

International economic policy coordination is the attempt to significantly modify national policies—monetary policy, fiscal policy, and exchange rate policy—in recognition of international economic interdependence. Policy coordination does not necessarily imply that nations give precedence to international concerns over domestic concerns. It does recognize, however, that the policies of one nation can spill over to influence the objectives of others; nations should therefore communicate with one another and attempt to coordinate their policies to take these linkages into account. Presumably, they will be better off than if they had acted independently.

To facilitate policy coordination, economic officials of the major governments talk with one another frequently in the context of the International Monetary Fund and the Organization for Economic Cooperation and Development. Also, central bank senior officials meet monthly at the Bank for International Settlements.

Policy Coordination in Theory

If economic policies in each of two nations affect the other, then the case for policy coordination would appear to be obvious. Policy coordination is considered important in the modern world because economic disruptions are transmitted rapidly from one nation to another. Without policy coordination, national economic policies can destabilize other economies. The logic of policy coordination is illustrated in the following basketball spectator problem.

Suppose you are attending a professional basketball game between the Los Angeles Lakers and the Chicago Bulls. If everyone is sitting, someone who stands has a superior view. Spectators usually can see well if everyone sits or if everyone stands. Sitting in seats is more comfortable than standing. When there is no cooperation, everyone stands; each spectator does what is best for her- or himself given the actions of other spectators. If all spectators sit, someone, taking what the others will do as a given, will stand. If all spectators are standing, then it is best to remain standing. With spectator cooperation, the solution is for everyone to sit. The problem is that each spectator may be tempted to get a better view by standing. The cooperative solution will not be attained without an outright agreement on coordination—in this situation, everyone remains seated.

Consider the following economic example. Suppose the world consists of just two nations, Germany and Japan. Although these nations trade goods with each other, they desire to pursue their own domestic economic priorities. Germany wants to avoid trade deficits with Japan while achieving full employment for its economy; Japan desires full employment for its economy while avoiding trade deficits with Germany. Assume that both nations achieve balanced trade with each other, but each nation's economy operates below full employment. Germany and Japan contemplate enacting expansionary government spending policies that would stimulate demand, output, and employment. Each nation rejects the idea, recognizing the policy's adverse impact on the trade balance. Germany and Japan realize that bolstering domestic income to increase jobs has the side effect of stimulating the demand for imports, thus pushing the trade account into deficit.

The preceding situation is favorable for successful policy coordination. If Germany and Japan agree to simultaneously expand their government spending, then output, employment,

and incomes will rise concurrently. While higher German income promotes increased imports from Japan, higher Japanese income promotes increased imports from Germany. An appropriate increase in government spending results in each nation's increased demand for imports being offset by an increased demand for exports that leads to balanced trade between Germany and Japan. In our example of mutual implementation of expansionary fiscal policies, policy coordination permits each nation to achieve full employment and balanced trade.

This is an optimistic portrayal of international economic policy coordination. The synchronization of policies appears simple because there are only two economies and two objectives. In the real world, policy coordination generally involves many countries and diverse objectives, such as low inflation, high employment, economic growth, and trade balance.

If the benefits of international economic policy coordination are really so obvious, it may seem odd that agreements do not occur more often than they do. Several obstacles hinder successful policy coordination. Even if national economic objectives are harmonious, there is no guarantee that governments can design and implement coordinated policies. Policy makers in the real world do not always have sufficient information to understand the nature of the economic problem or how their policies will affect economies. Implementing appropriate policies when governments disagree about economic fundamentals is difficult for several reasons.

- Some nations give higher priority to price stability, for instance, or to full employment, than others.
- Some nations have a stronger legislature, or weaker trade unions, than others.
- The party pendulums in different nations, for example, shift with elections occurring in different years.
- One nation may experience economic recession while another nation experiences rapid inflation.

Although the theoretical advantages of international economic policy coordination are clearly established, attempts to quantify their gains are rare. Skeptics point out that in practice the gains from policy coordination are smaller than what is often suggested. Let us consider some examples of international economic policy coordination.

Does Policy Coordination Work?

Does coordination of economic policies improve the performance of nations? Proponents of policy coordination cite the examples of the Plaza Agreement of 1985 and the Louvre Accord of 1987.

The deterioration of the U.S. trade balance was a disturbing feature of the economic recovery of the United States in the early 1980s. This deterioration was influenced by a dramatic appreciation of the dollar that overwhelmed the other determinants of international cost competitiveness. Between 1980 and 1985, the dollar's appreciation boosted the ratio of U.S. unit labor costs to foreign unit labor costs by 39 percent, detracting from the international competitiveness of U.S. manufacturers. American net exports of goods and services declined, resulting in large trade deficits. As the U.S. economic recovery slowed, protectionist pressures increased in Congress.

Fearing a disaster in the world trading system, government officials of the **Group of Five (G-5)** nations—the United States, Japan, Germany, Great Britain, and France—met at New York's Plaza Hotel in 1985. There was widespread agreement that the dollar was overvalued and that the twin U.S. deficits (trade and federal budget) were too large. Each country made specific pledges on macroeconomic policy and also agreed to initiate coordinated sales of the dollar to shove its exchange value downward. By 1986, the dollar had dramatically depreciated, especially against the German mark and the Japanese yen.

However, the sharp decline in the dollar's exchange value set off a new concern: an uncontrolled dollar plunge. So in 1987, another round of policy coordination occurred to put the brakes on the dollar's decline. The G-5 financial ministers met in Paris and agreed in the Louvre Accord to pursue intervention policies curbing the pace of the dollar's depreciation, to be accompanied by other macroeconomic adjustments.

Although the episodes of the Plaza Agreement and Louvre Accord point to the success of policy coordination, by the first decade of the 2000s, government officials were showing less enthusiasm for it. They felt that coordinating policy had become much more difficult because of the way policy is made, especially given the rise of independent central banks. Back in the 1980s, the governments of Japan and Germany could dictate what their central banks would do. Since that time, the Bank of Japan and the European Central Bank have become more independent and see themselves as protectors of discipline against high-spending government officials. That role makes domestic fiscal and monetary coordination difficult and international efforts to coordinate policies even more difficult. The huge growth in global financial markets has made currency intervention much less effective.

An example of unsuccessful international policy coordination occurred in 2000. At that time, the **Group of Seven (G-7)** industrial nations—the United States, Canada, Japan, the United Kingdom, Germany, France, and Italy—launched coordinated purchases of the euro to boost its value. Although the euro was launched in 1999, at an exchange value of \$1.17 per euro, by mid-2000 its value had dropped to \$0.84 per euro. Many economists feared that continued speculative attacks against the euro might result in a free fall of its value that could destabilize the international financial system. To prevent this from happening, the G-7 nations enacted a coordinated intervention by purchasing euros with their currencies in the foreign exchange market. The added demand for the euro helped boost its value to more than \$0.88 per euro. The success of the intervention was short lived. Within two weeks following the intervention, the euro's value slid to an all-time low. Most economists considered the coordinated intervention to be a failure.

INTERNATIONAL FINANCE APPLICATION

Does Crowding Occur in an Open Economy?

In your principles of macroeconomics course, you learned about “crowding out” in the domestic economy. Crowding out refers to private consumption or investment spending decreasing as a result of increased government expenditures and the subsequent budget deficits. The source of the decline in private spending is higher interest rates caused by budget deficits.

Suppose that the government enacts an expansionary fiscal policy, say, an increase in defense spending. The policy must be financed either by increased taxes or through the borrowing of funds to permit the enlarged federal deficit. If the government borrows funds, the total demand for funds will increase as the government competes with the private sector to borrow the available supply of funds. The additional government borrowing



increases the total demand for funds and pushes up interest rates. Because of higher interest rates, businesses will delay or cancel purchases of machinery and equipment, residential housing construction will be postponed, and consumers will refrain from buying interest-sensitive goods, such as major appliances and automobiles. The higher interest rates caused by government borrowing squeeze out private sector borrowing. Crowding out lessens the effectiveness of an expansionary fiscal policy.

Although economists tend to accept the logic of the crowding out argument, they recognize that government deficits don't necessarily squeeze out private spending. In recessions, the main problem is that people are not spending all of the available funds. Typically, consumers

(continued)

are saving more than businesses intend to invest. Such a shortage of spending is the main motivation for increased government spending. In this recessionary situation, deficit-financed government spending doesn't crowd out private spending.

The extent of crowding out tends also to be lessened in an open economy with capital flows. This is because inflows of capital from abroad tend to keep interest rates lower than they otherwise would be. The government can borrow more money without forcing up interest rates that crowd private borrowers out of the market.

The experience of the United States during the first decade of the 2000s casts doubt on the crowding out hypothesis. Despite growing federal budget deficits, interest rates remained low in the United States as

foreigners were content to purchase huge amounts of securities issued by the government. Analysts noted that if not for the inflow of foreign capital, U.S. interest rates would be about 1.5 percentage points higher. Skeptics noted that the free spending policy would eventually have to cease if foreigners begin to doubt the ability of the United States to repay its debt with sound currency. This doubt would cause foreign investors to demand higher interest rates if they were to keep lending the United States the money it needs, or they might simply stop lending to the United States, thus making the crowding out more likely.

What do you think? Is crowding out a major problem for our economy?

Source: Economic Report of the President, 2008, 2009.

SUMMARY

1. International economic policy refers to various government activities that influence trade patterns among nations, including (a) monetary and fiscal policies, (b) exchange rate adjustments, (c) tariff and nontariff trade barriers, (d) foreign exchange controls and investment controls, and (e) export promotion measures.
2. Since the 1930s, nations have actively pursued internal balance (full employment without inflation) as a primary economic objective. Nations also consider external balance (current account equilibrium) as an economic objective. A nation realizes overall balance when it attains both internal and external balance.
3. To achieve overall balance, nations implement expenditure changing policies (monetary and fiscal policies), expenditure switching policies (exchange rate adjustments), and direct controls (price and wage controls).
4. For an open economy with a fixed exchange rate system and high capital mobility, fiscal policy is more successful, and monetary policy is less successful, in promoting internal balance than they are in a closed economy. If the open economy has a floating exchange rate system, monetary policy is more successful, and fiscal policy is less successful, in promoting internal balance than they are for a closed economy.
5. When a nation experiences inflation with unemployment, achieving overall balance involves three separate targets: current account equilibrium, full employment, and price stability. Three policy instruments may be needed to achieve these targets.
6. International economic policy coordination is the attempt to significantly modify national policies in recognition of international economic interdependence. Nations regularly consult with one another in the context of the International Monetary Fund, Organization for Economic Cooperation and Development, Bank for International Settlements, and Group of Seven. The Plaza Agreement and Louvre Accord are examples of international economic policy coordination.
7. Several problems confront international economic policy coordination: (a) different national economic objectives, (b) different national institutions, (c) different national political climates, and (d) different phases in the business cycle. There is no guarantee that governments can design and implement policies that are capable of achieving the intended results.

KEY CONCEPTS AND TERMS

Demand-pull inflation (p. 503)
 Direct controls (p. 496)
 Expenditure changing policies (p. 496)
 Expenditure switching policies (p. 496)

External balance (p. 495)
 Fiscal policy (p. 496)
 Group of Five (G-5) (p. 506)
 Group of Seven (G-7) (p. 507)
 Internal balance (p. 495)

International economic policy coordination (p. 505)
 Monetary policy (p. 496)
 Overall balance (p. 495)
 Wage and price controls (p. 504)

STUDY QUESTIONS

1. Distinguish among external balance, internal balance, and overall balance.
2. What are the most important instruments of international economic policy?
3. What is meant by the terms *expenditure changing policy* and *expenditure switching policy*? Give some examples of each.
4. What institutional constraints bear on the formation of economic policies?
5. Under a system of fixed exchange rates and high capital mobility, is monetary policy or fiscal policy better suited for promoting internal balance? Why?
6. What is meant by the terms *policy agreement* and *policy conflict*?
7. What are some obstacles to successful international economic policy coordination?

EXPLORING FURTHER

For a presentation of *International Banking: Reserves, Debt, and Risk*, go to *Exploring Further 15.1*, which can be found in MindTap.

Glossary



A

Absolute quota A physical restriction on the quantity of goods that can be imported during a specific time period.

Absorption approach An approach to currency depreciation that deals with the income effects of depreciation; a decrease in domestic expenditures relative to income must occur for depreciation to promote payments equilibrium, according to the absorption approach.

Ad valorem tariff A tariff expressed as a fixed percentage of the value of the imported product.

Adjustable pegged exchange rates A system of semifixed exchange rates where it is understood that the par value of the currency will be changed occasionally in response to changing economic conditions.

Advanced nations Includes those of North America and Western Europe, plus Australia, New Zealand, and Japan.

Agglomeration economies A rich country specializes in manufacturing niches and gains productivity through groups of firms clustered together, some producing the same product and others connected by vertical linkages.

Antidumping duty A duty levied against commodities a home nation believes are being dumped into its markets from abroad.

Appreciation (as applied to currency markets) When, over a period of time, it takes fewer units of a nation's currency to purchase one unit of a foreign currency.

Asset market approach A method of determining short-term exchange rates where investors consider two key factors when deciding between domestic and foreign investments; relative levels of interest rates and expected changes in the exchange rate itself over the term of the investment.

Autarky A case of national self-sufficiency or absence of trade.

B

Balance of international indebtedness A statement that summarizes a country's stock of assets and liabilities against the rest of the world at a fixed point in time.

Balance-of-payments A record of the flow of economic transactions between the residents of one country and the rest of the world.

Basis for trade Why nations export and import certain products.

Beggar-thy-neighbor policy The practice of imposing protectionist policies to achieve gains from trade at the expense of other nations.

Benelux A customs union formed in 1948 that includes Belgium, the Netherlands, and Luxembourg.

Bid rate The price that the bank is willing to pay for a unit of foreign currency.

Bonded warehouse A storage facility operated under the lock and key of (in the case of the United States) the U.S. Customs Service.

Brain drain Emigration of highly educated and skilled people from developing nations to industrial nations.

Bretton Woods system A new international monetary system created in 1944 by delegates from 44 member nations of the United Nations that met at Bretton Woods, New Hampshire.

Brexit Great Britain's exit from the European Union.

Buffer stock Supplies of a commodity financed and held by a producers' association; used to limit commodity price swings.

Buy national policies When a home nation's government, through explicit laws, openly discriminates against foreign suppliers in its purchasing decisions.

C

Call option Gives the holder the right to buy foreign currency at a specified price.

Capital and financial account The net result of both private sector and official capital and financial transactions.

Capital controls Government imposed barriers to foreign savers investing in domestic assets or to domestic savers investing in foreign assets; also known as exchange controls.

Capital-labor ratio A country's ratio of capital inputs to labor inputs.

Cartel A group of firms or nations that attempts to support prices higher than would exist under more competitive conditions.

Clean float When free-market forces of supply and demand are allowed to determine the exchange value of a currency.

Commodity terms of trade Measures the relation between the prices a nation gets for its exports and the prices it pays for its imports.

Common agricultural policy Members of the European Union agree to maintain identical governmental agricultural policies to support farmers.

Common market A group of trading nations that permits the free movement of goods and services among member nations, the initiation of common external trade restrictions against nonmembers, and the free movement of factors of production across national borders within the economic bloc.

Complete specialization A situation in which a country produces only one good.

Compound tariff A tariff that is a combination of a specific tariff and an ad valorem tariff.

Conglomerate integration In the case of an MNE, diversification into nonrelated markets.

Constant opportunity costs A constant rate of sacrifice of one good for another as a nation slides along its production possibilities schedule.

Consumer surplus The difference between the amount that buyers would be willing and able to pay for a good and the actual amount they do pay.

Consumption effect A trade restriction's loss of welfare that occurs because of increased prices and lower consumption.

Consumption gains Post-trade consumption points outside a nation's production possibilities schedule.

Convergence criteria Economic standards required of all nations in a monetary union; in the instance of the Maastricht Treaty, these standards included price stability, low long-term interest rates, stable exchange rates, and sound public finances.

Corporate average fuel economy (CAFÉ) standards Fuel economy standards imposed by the U.S. government on automobile manufacturers.

Cost-based definition of dumping When a foreign company sells a product in the U.S. market at a price below average total cost.

Cost-insurance-freight (CIF) valuation When ad valorem tariffs are levied as a percentage of the imported commodity's total value as it arrives at its final destination.

Countervailing duty A levy imposed by importing countries to counteract foreign export subsidies; the size of the duty is limited to the amount of the export subsidy.

Covered interest arbitrage The process of moving funds into foreign currencies to take advantage of higher investment yields abroad while avoiding exchange rate risk.

Crawling peg A system in which a nation makes small, frequent changes in the par value of its currency to correct balance-of-payments disequilibria.

Credit transaction A balance-of-payments transaction that results in a receipt of a payment from foreigners.

Cross exchange rate The resulting rate derived when the exchange rate between any two currencies can be derived from the rates of these two currencies in terms of a third currency.

Currency board A monetary authority that issues notes and coins convertible into a foreign anchor currency at a fixed exchange rate.

Currency crashes Financial crises that often end in currency devaluations or accelerated depreciations.

Currency crisis A situation in which a weak currency experiences heavy selling pressure, also called a speculative attack.

Currency risk Investment risk associated with currency depreciations and appreciations as well as exchange controls.

Currency swap The conversion of one currency to another currency at one point in time, with an agreement to reconvert it to the original currency at a specified time in the future.

Current account The net value of monetary flows associated with transactions in goods and services, investment income, employee compensation, and unilateral transfers.

Customs union An agreement among two or more trading partners to remove all tariff and nontariff trade barriers among themselves; each member nation imposes identical trade restrictions against nonparticipants.

Customs valuation The process of determining the value of an imported product.

D

Deadweight loss The net loss of economic benefits to a domestic economy because of the protective and consumption effect of a trade barrier.

Debit transaction A balance-of-payments transaction that leads to a payment to foreigners.

Demand-pull inflation When a nation's capacity to produce has been achieved, and further increases in aggregate demand pull prices upward.

Depreciation (as applies to currency markets) When, over a period of time, it takes more units of a nation's currency to purchase one unit of a foreign currency.

Destabilizing speculation Occurs when speculators expect a current trend in exchange rates to continue and their transactions accelerate the rise or fall of the target currency's value.

Devaluation An official change in a currency's par value that causes the currency's exchange value to depreciate.

Developing nations Most nations in Africa, Asia, Latin America, and the Middle East.

Digital Trade The use of digital technologies (e-commerce) that facilitate business transactions.

Direct controls Consist of government restrictions on the market economy.

Dirty float A condition under a managed floating system when free-market forces of supply and demand are not allowed to achieve their equilibrating role; countries may manage their exchange rates to improve the competitiveness of their producers.

Discount The valuation of a currency when it is worth less in the forward market than in the spot market.

Doha Round The most recent round of multilateral trade negotiations under the World Trade Organization.

Dollarization Occurs when residents of a foreign country use the U.S. dollar alongside or instead of their domestic currency.

Domestic content requirements Requirements that stipulate the minimum percentage of a product's total value that must be produced domestically if the product is to qualify for zero tariff rates.

Domestic production subsidy A subsidy that is sometimes granted to producers of import-competing goods.

Domestic revenue effect The amount of tariff revenue shifted from domestic consumers to the tariff-levying government.

Double entry accounting A system of accounting in which each credit entry is balanced by a debit entry, and vice versa, so that the recording of any transaction leads to two offsetting entries.

Dumping When foreign buyers are charged lower prices than domestic buyers for an identical product after allowing for transportation costs and tariff duties.

Dynamic comparative advantage A changing pattern in comparative advantage; governments can establish policies to promote opportunities for changes in comparative advantage over time.

Dynamic effects of economic integration Effects that relate to member nations' long-term rates of growth, that includes economies of scale, greater competition, and investment stimulus.

Dynamic gains from international trade The effect of trade on the country's growth rate and thus on the volume of additional resources made available to, or utilized by, the trading country.

E

Economic integration A process of eliminating restrictions on international trade, payments, and factor mobility.

Economic interdependence All aspects of a nation's economy are linked to the economies of its trading partners.

Economic sanctions Government-mandated limitations placed on customary trade or financial relations among nations.

Economic union Where national, social, taxation, and fiscal policies are harmonized and administered by a supranational institution.

Economies of scale When increasing all inputs by the same proportion results in a greater proportion of total output.

Effective exchange rate A weighted average of the exchange rates between a domestic currency and that nation's most important trading partners, with weights given by relative importance of the nation's trade with each trade partner.

Effective tariff rate Measures the total increase in domestic production that a tariff makes possible, compared to free trade.

Elasticity approach An approach to currency depreciation that emphasizes the relative price effects of depreciation and suggests that depreciation works best when demand elasticities for a nation's imports and exports are high.

Escape clause Allows the president to temporarily terminate or make modifications in trade concessions granted to foreign nations and to temporarily levy restrictions on surging imports.

Euro The official currency of the EMU.

European Monetary Union (EMU) The countries of Europe that in 1999 abolished their national currencies and central banks and replaced them with the euro and the European Central Bank.

European Union (EU) A trading bloc that replaced the European Community following ratification of the Maastricht Treaty by the 12 member countries of the European Community.

Exchange arbitrage The simultaneous purchase and sale of a currency in different foreign exchange markets in order to profit from exchange rate differentials in the two locations.

Exchange controls Government imposed barriers to foreign savers investing in domestic assets (e.g., government securities, stock, or bank deposits) or to domestic savers investing in foreign assets.

Exchange rate The rate (price) at which one currency exchanges for another.

Exchange rate index A weighted average of the exchange rates between a domestic currency and that nation's most important trading partners, with weights given by relative importance of the nation's trade with each trade partner.

Exchange rate misalignment Movements in exchange rates may not properly reflect corresponding changes in countries' competitiveness positions.

Exchange rate pass-through The extent to which changing currency values lead to changes in import and export prices.

Exchange stabilization fund A government entity that attempts to ensure that the market exchange rate does not move above or below the official exchange rate through purchases and sales of foreign currencies.

Exit barriers Hurdles that make it difficult to move out of an industry.

Expenditure changing policies Policies that alter the level of aggregate demand for goods and services, including those produced domestically and those imported.

Expenditure switching policies Policies that modify the direction of demand, shifting it between domestic output and imports.

Export-Import Bank (Eximbank) An independent agency of the U.S. government established to encourage the exports of U.S. businesses.

Export-led growth Involves promoting economic growth through the export of manufactured goods—trade controls are either nonexistent or very low, in the sense that any disincentives to export resulting from import barriers are counterbalanced by export subsidies.

Export-oriented policy See export-led growth.

Export quotas Limitations on export sales administered by one or more exporting nations or industries.

Export subsidy A subsidy paid to exporters so they can sell goods abroad at the lower world price but still receive the higher support price.

External balance When a nation realizes neither balance-of-payments deficits nor balance-of-payments surpluses.

External economies of scale Cost reductions for a firm that occur as the output of the industry increases.

F

Factor mobility The ability of factors of production (land, labor, capital, and entrepreneurship) to move from one industry to another industry.

Factor-endowment theory Asserts that a country exports those goods that use its abundant factor more intensively.

Factor-price equalization Free trade's tendency to cause cheap factors of production to become more expensive, and the expensive factors of production to become cheaper.

Fast track authority Devised in 1974, this provision commits the U.S. Congress to consider trade agreements without amendment; in return, the president must adhere to a specified timetable and several other procedures.

Fiscal policy Refers to changes in government spending and taxes.

Fixed exchange rates A system used primarily by small developing nations whose currencies are anchored to a key currency, such as the U.S. dollar.

Floating exchange rates When a nation allows its currency to fluctuate according to the free market forces of supply and demand.

Flying geese pattern of economic growth Where countries gradually move up in technological development by following in the pattern of countries ahead of them in the development process.

Forecasting exchange rates Attempts to predict future rates of exchange.

Foreign currency options Provide an options holder the right to buy or sell a fixed amount of foreign currency at a prearranged price, within a few days or several years.

Foreign direct investment Foreign acquisition of a controlling interest in an overseas company or facility.

Foreign exchange market The organizational setting within which individuals, businesses, governments, and banks buy and sell foreign currencies and other debt instruments.

Foreign-trade zone (FTZ) Special zones that enlarge the benefits of a bonded warehouse by eliminating the restrictive aspects of customs surveillance and by offering more suitable manufacturing facilities; FTZs are intended to stimulate international trade, attract industry,

and create jobs by providing an area that gives users tariff and tax breaks.

Forward market Where foreign exchange can be traded for future delivery.

Forward rate The rate of exchange used in the settlement of forward transactions.

Forward transaction An outright purchase and sale of foreign currency at a fixed exchange rate but with payment or delivery of the foreign currency at a future date.

Free trade A system of open markets between countries in which nations concentrate their production on goods they can make most cheaply, with all the consequent benefits of the division of labor.

Free trade area An association of trading nations whose members agree to remove all tariff and nontariff barriers among themselves.

Free trade argument If each nation produces what it does best and permits trade, over the long term each party will enjoy lower prices and higher levels of output, income, and consumption than could be achieved in isolation.

Free trade–biased sector Generally comprises exporting companies, their workers, and their suppliers; it also consists of consumers, including wholesalers and retail merchants of imported goods.

Free-on-board (FOB) valuation When a tariff is applied to a product's value as it leaves the exporting country.

Fundamental analysis The opposite of technical analysis; involves consideration of economic variables that are likely to affect a currency's value.

Fundamental disequilibrium When the official exchange rate and the market exchange

rate may move apart, reflecting changes in fundamental economic conditions—income levels, tastes and preferences, and technological factors.

Futures market A market in which contracting parties agree to future exchanges of currencies and set applicable exchange rates in advance; distinguished from the forward market in that only a limited number of leading currencies are traded; trading takes place in standardized contract amounts and in a specific geographic location.

G

Gains from international trade Gains trading partners simultaneously enjoy due to specialization and the division of labor.

General Agreement on Tariffs and Trade (GATT) Signed in 1947, GATT was crafted as an agreement among contracting parties, the member nations, to decrease trade barriers and place all nations on an equal footing in trading relations; GATT was never intended to become an organization; instead it was a set of bilateral agreements among countries around the world to reduce trade barriers.

Generalized system of preferences (GSP) A system in which industrialized nations attempt to promote economic development in developing countries through lower tariffs and increased trade rather than foreign aid.

Global quota A technique permitting a specified number of goods to be imported each year, but does not specify where the product is shipped from or who is permitted to import.

Global supply chains The international network created among different companies producing, handling, and/or distributing a specific product.

Globalization The process of greater interdependence among countries and their citizens.

Goods and services balance The result of combining the balance of trade in services and the merchandise trade balance.

Group of Five (G-5) Five industrial nations—the United States, Japan, Germany, the United Kingdom, and France—that sent officials to a world trade meeting at New York's Plaza Hotel in 1985 to try to correct the overvalued dollar and the twin U.S. deficits.

Group of Seven (G-7) Seven industrial nations—the United States, Canada, Japan, the United Kingdom, Germany, France, and Italy—that launched coordinated purchases of the euro to boost its value.

Guest workers Foreign workers, when needed, allowed to immigrate on a temporary basis.

H

Heckscher-Ohlin theory Differences in relative factor endowments among nations that underlie the basis for trade.

Hedging The process of avoiding or covering a foreign exchange risk.

Home market effect Countries will specialize in products for which there is large domestic demand.

Horizontal integration In the case of an MNE, occurs when a parent company producing a commodity in the source country sets up a subsidiary to produce the identical product in the host country.

I

Import licenses Used to administer an import quota; a license specifying the volume of imports allowed.

Import substitution A policy that involves extensive use of trade barriers to protect domestic industries from import competition.

Importance of being unimportant When one trading nation is significantly larger than the other, the larger nation attains fewer gains from trade while the smaller nation attains most of the gains from trade.

Impossible trinity A restriction whereby a country can maintain only two of the following three policies—free capital flows, a fixed exchange rate, and an independent monetary policy.

Income balance Net investment income plus net compensation of employees.

Increasing opportunity costs When each additional unit of one good produced requires the sacrifice of increasing amounts of the other good.

Industrial policy Government policy that is actively involved in creating comparative advantage.

Infant-industry argument A tariff that temporarily shields newly developing industries from foreign competition.

Intellectual property rights (IPRs) The exclusive rights to use an invention, idea, product, or process for a given time awarded to the inventor (or author) through registration with the government of that invention, idea, product, or process.

Inter-industry specialization When each nation specializes in a particular industry in which it enjoys a comparative advantage.

Inter-industry trade The exchange between nations of products of different industries.

Interbank market The trading of currencies among major banks.

Interest arbitrage The process of moving funds into foreign currencies to take advantage of higher investment yields abroad.

Internal balance The goal of economic stability at full employment.

Internal economies of scale Reductions in the average total cost of producing a product as a firm increases the size of its plant in the long run.

International commodity agreements (ICAs) Agreements between leading producing and consuming nations of commodities about matters such as stabilizing prices, assuring adequate supplies to consumers, and promoting the economic development of producers.

International economic policy coordination The attempt to coordinate national policies—monetary, fiscal, or exchange rate policy—in recognition of international economic interdependence.

International joint ventures An example of multinational enterprise in which a business organization established by two or more companies combines their skills and assets.

International Monetary Fund (IMF) Headquartered in Washington, and consisting of 184 nations, the IMF can be thought of as a bank for the central banks of member nations.

International Monetary Market (IMM) An extension of the commodity futures markets in which specific quantities of wheat, corn, and other commodities are bought and sold for future delivery at specific dates; the IMM provides trading facilities for the purchase and sale for future delivery of financial instruments (such as foreign currencies) and precious metals (such as gold).

Intra-industry specialization The focus on the production of particular products or groups of products within a given industry.

Intra-industry trade Two-way trade in a similar commodity.

J

J-curve effect A popular description of the time path of trade flows suggesting that in the very short term, a currency depreciation will lead to a worsening of the nation's trade balance, but as time passes, the trade balance will likely improve.

Judgmental forecasts Subjective or commonsense exchange rate forecasts based on economic, political, and other data for a country.

K

Kennedy Round Round of trade negotiations named after U.S. President John F. Kennedy between GATT members during the period 1964–1967.

Key currency A currency that is widely traded on world money markets, has demonstrated relatively stable values over time, and has been widely accepted as a means of international settlement.

L

Labor mobility A measure of how labor migration responds to wage differentials.

Labor theory of value The cost or price of a good depends exclusively upon the amount of labor required to produce it.

Large nation An importing nation that is large enough so that changes in the quantity of its imports, by means of tariff policy, influence the world price of the product.

Law of comparative advantage When each nation specializes in the production of that good in which it has a relative advantage, the total output of each good increases; thus, all countries can realize welfare gains.

Law of one price Part of the purchasing-power-parity approach to determining exchange rates, asserts that identical goods should cost the same in all nations, assuming that it is costless to ship goods between nations and there are no barriers to trade.

Leaning against the wind Intervening to reduce short-term fluctuations in exchange rates without attempting to adhere to any particular rate over the long term.

Leontief paradox The phenomenon of exports being less capital intensive than import-competing goods.

Level playing field A condition in which domestic and foreign producers can compete on equal terms.

License on demand allocation A system in which licenses are required to import at the within-quota tariff.

Long position Buying a currency at a low price, then selling it at a higher price later on.

M

Maastricht Treaty Signed in 1991, this agreement set 2002 as the date for completing the process of replacing the EU countries' central banks with a European Central Bank and replacing their national currencies with a single European currency.

Magnification effect An extension of the Stolper–Samuelson theorem, that suggests that the change in the price of a resource is greater than the change in the price of the good that uses the resources relatively intensively in its production process.

Managed floating system An exchange rate system in which the rate is usually allowed to be determined by the free market forces of supply and demand, while sometimes entailing some degree of government (central bank) intervention.

Margin of dumping The amount the domestic price of a firm's product exceeds its foreign price, or the amount the foreign price of a firm's product is less than the cost of producing it.

Marginal rate of transformation (MRT) The slope of the production possibilities schedule that shows the amount of one product a nation must sacrifice to get one additional unit of the other product.

Market expectations Examples include news about future market fundamentals and traders' opinions about future exchange rates.

Market fundamentals Economic variables such as productivity, inflation rates, real interest rates, consumer preferences, and government trade policy.

Marshall–Lerner condition A general rule that states: (1) Depreciation will improve the trade balance if the currency-depreciating nation's demand elasticity for imports plus the foreign demand elasticity for the nation's exports exceeds one. (2) If the sum of the demand elasticities is less than one, depreciation will worsen the trade balance. (3) The trade balance will be neither helped nor hurt if the sum of the demand elasticities equals one.

Maturity months The months of a given year when the futures contract matures.

Mercantilists An advocate or practitioner of mercantilism; a national economic system in which a nation could regulate its domestic and international affairs so as to promote its own interests through a strong foreign trade sector.

Merchandise trade balance The result of combining the dollar value of merchandise exports recorded as a plus (credit) and the dollar value of merchandise imports recorded as a minus (debit).

Migration Moving from one country to settle in another.

Monetary approach An approach to currency depreciation that stresses the effects depreciation has on the purchasing power of money and the resulting impact on domestic expenditure levels.

Monetary policy Refers to changes in the money supply by a nation's central bank.

Monetary union The unification of national monetary policies and the acceptance of a common currency administered by a supranational monetary authority.

Most favored nation (MFN) clause An agreement between two nations to apply tariffs to each other at rates as low as those applied to any other nation.

Multifiber Arrangement (MFA) A system of rules negotiated by the United States and Europe to restrict competition from developing exporting countries employing low-cost labor.

Multilateral contracts Contract that stipulates a minimum price at which importers will purchase guaranteed quantities from the producing nations and a maximum price at which producing nations will sell guaranteed amounts to importers.

Multinational enterprise (MNE) An enterprise that cuts across national borders and is often directed from a company planning center that is distant from the host country.

N

Net creditor The status of a nation when that country's claims on foreigners exceed foreign claims on that country at a particular time.

Net debtor The status of a nation when foreign claims on a country exceed that country's claims on foreigners at a particular time.

Net foreign investment In national income accounting, is synonymous with the current account balance.

Nominal exchange rate index The average value of a currency, not adjusted for changes in price levels of that country and its trading partners.

Nominal exchange rates Exchange rate quotes published in newspapers that are not adjusted inflation rates in trading partners.

Nominal interest rate The rate of return on assets that can be earned in a particular country, not adjusted for the rate of inflation.

Nominal tariff rate The tariff rate published in a country's tariff schedule.

Nontariff trade barriers (NTBs) Policies other than tariffs that restrict international trade.

Normal trade relations The U.S. government's replacement for the term most favored nation.

North American Free Trade Agreement (NAFTA) A trade agreement between Canada, Mexico, and the United States that went into effect in 1994.

No-trade boundary The division point where trade is beneficial and trade is not beneficial.

O

Offer rate The price at which the bank is willing to sell a unit of foreign currency.

Official exchange rate The exchange rate determined by comparing the par values of two currencies.

Official reserve assets Holding key foreign currencies, special drawing rights, and reserve positions in the IMF by official monetary institutions.

Official settlements transactions The movement of financial assets among official holders; these financial assets fall into two categories: official reserve assets and liabilities to foreign official agencies.

Offshore assembly provision (OAP) When import duties apply only to the value added in the foreign assembly process provided that domestically made components are used by overseas companies in their assembly operations.

Openness The ratio of a nation's exports and imports as a percentage of its gross domestic product (GDP).

Optimal currency area A region in which it is economically preferable to have a single official currency rather than multiple official currencies.

Optimal tariff A tariff rate at which the positive difference between the gain of improving terms of trade and the loss of declining import volume is maximized.

Option An agreement between a holder (buyer) and a writer (seller) that gives the holder the right, but not the obligation, to buy or sell financial instruments at any time through a specified date.

Organization of Petroleum Exporting Countries (OPEC) A group of nations that sells petroleum on the world market and attempts to support prices higher than would exist under more competitive conditions to maximize member nation profits.

Outer limits for the equilibrium terms of trade Defined by the domestic cost ratios of trading nations.

Outsourcing When certain aspects of a product's manufacture are performed in more than one country.

Overall balance When an economy attains internal and external balance.

Overshooting An instance of an exchange rate's short-term response to a change in market fundamentals is greater than its long-term response.

P

Par value A central value in terms of a key currency that governments participating in a fixed exchange rate system set their currencies.

Partial specialization When a country specializes only partially in the production of the good in which it has a comparative advantage.

Persistent dumping When a producer consistently sells products abroad at lower prices than at home.

Predatory dumping When a producer temporarily reduces the prices charged abroad to drive foreign competitors out of business.

Premium The valuation of a currency when it is worth more in the forward market than in the spot market.

Price-specie-flow doctrine David Hume's theory that a favorable trade balance was possible only in the short term, and that over time, it would automatically be eliminated via changes in product prices.

Price-based definition of dumping When a foreign company sells a product in the U.S. market at a price below that for which the same product sells in the home market.

Primary products Agricultural goods, raw materials, and fuels.

Principle of absolute advantage In a two-nation, two-product world, international specialization and trade will be beneficial when one nation has an absolute cost advantage in one good and the other nation has an absolute cost advantage in the other good.

Principle of comparative advantage Ability to produce a good or service at a lower opportunity cost than others can produce it.

Producer surplus The revenue producers receive over and above the minimum amount required to induce them to supply the good.

Product life cycle theory Many manufactured goods undergo a predictable trade cycle; during this cycle, the home country initially is an exporter, then loses its competitive advantage vis-à-vis its trading partners, and eventually may become an importer of the commodity.

Production and export controls Restrictions on output that are intended to increase the price of a product.

Production gains Increases in production resulting from specialization in the product of comparative advantage.

Production possibilities frontier A schedule that shows various alternative combinations of two goods that a nation can produce when all of its factor inputs are used in their most efficient manner.

Protection-biased sector Generally consists of import-competing companies, the labor unions representing workers in that industry, and the suppliers to the companies in the industry.

Protective effect A tariff's loss to the domestic economy resulting from wasted resources when less efficient domestic production is substituted for more efficient foreign production.

Protective tariff A tariff designed to insulate import-competing producers from foreign competition.

Purchasing-power-parity theory A method of determining the equilibrium exchange rate by means of the price levels and their variations in different nations.

Put option Gives the holder the right to sell foreign currency at a specified price.

R

Real exchange rate The nominal exchange rate adjusted for changes in relative price levels.

Real exchange rate index The average value of a currency based on real exchange rates.

Real interest rate The nominal interest rate minus the inflation rate.

Reciprocal Trade Agreements Act An act passed in Congress in 1934 that set the stage for a wave of trade liberalization through negotiating authority and generalized reductions.

Redistributive effect With a tariff, the transfer of consumer surplus in monetary terms to the domestic producers of the import-competing product.

Region of mutually beneficial trade The area that is bounded by the cost ratios of the two trading countries.

Regional trading arrangement Where member nations agree to impose lower barriers to trade within the group than to trade with nonmember nations.

Revaluation An official change in a currency's par value that causes the currency's exchange value to appreciate.

Revenue effect Represents the government's collections of tariff revenue; found by multiplying the number of imports times the tariff.

S

Safeguards Relief provided by the escape clause to U.S. firms and workers who are substantially injured from surges in imports that are fairly traded.

Scientific tariff A tariff that eliminates foreign cost advantages over domestic firms.

Section 301 Section of the Trade Act of 1974 that gives the U.S. trade representative (USTR) authority, subject to the approval of the president, and means to respond to unfair trading practices by foreign nations.

Seigniorage Profit from issuing money.

Selective quota An import quota allocated to specific countries.

Short position Sell a currency (that you don't own) at a high price then buy it back later on at a low price.

Small nation A nation whose imports constitute a small portion of the world market supply. This *small nation* would be a *price taker*, facing a constant world price level for its import commodity.

Smoot–Hawley Act Act passed in 1930 under which U.S. average tariffs were raised to 53 percent on protected imports.

Social regulation Governmental attempts to correct a variety of undesirable side effects in an economy that relate to health, safety, and the environment.

Special drawing right (SDR) An artificial currency unit based on a basket of four currencies established by the IMF.

Specific factors Factors of production that are unable to move into or out of an industry.

Specific tariff A tariff expressed in terms of a fixed amount of money per unit of the imported product.

Specific-factors theory Considers the income distribution effects of trade when factor inputs are immobile among industries in the short term.

Speculation The attempt to profit by trading on expectations about prices in the future.

Speculative attack See currency crisis.

Sporadic dumping (distress dumping) When a firm disposes of excess inventories on foreign markets by selling abroad at lower prices than at home.

Spot market Where foreign exchange can be traded for immediate delivery.

Spot transaction An outright purchase and sale of foreign currency for cash settlement not more than two business days after the date of the transaction.

Spread The difference between the bid and the asking price(s).

Stabilizing speculation Occurs when speculators expect a current trend in an exchange rate's movement to change and their purchase or sale of the currency moderates movements of the exchange rate.

Static effects of economic integration Includes the trade-creation effect and the trade-diversion effect.

Statistical discrepancy The errors and omissions that apply to an accounting statement such as the balance-of-payments.

Stolper–Samuelson theorem An extension of the theory of factor-price equalization,

which states that the export of the product that embodies large amounts of the relatively cheap, abundant resource makes this resource more scarce in the domestic market.

Strategic trade policy The policy that government can assist domestic companies in capturing economic profits from foreign competitors.

Strike price The price at which an option can be exercised.

Subsidies Granted by governments to domestic producers to improve their trade competitiveness; include outright cash disbursements, tax concessions, insurance arrangements, and loans at below-market interest rates.

T

Target exchange rates Desired exchange rates for a currency set by the host country and supported by intervention.

Tariff A tax levied on a product when it crosses national boundaries.

Tariff avoidance The legal utilization of the tariff system to one's own advantage in order to reduce the amount of tariff that is payable by means that are within the law.

Tariff escalation Occurs when tariff structures of industrialized nations are characterized by rising rates that give greater protection to intermediate and finished products than to primary commodities.

Tariff evasion When individuals or firms evade tariffs by illegal means such as smuggling imported goods into a country.

Tariff-rate quota A device that allows a specified number of goods to be imported at

one tariff rate (the within-quota rate), and any imports above that specified number to be imported at a higher tariff rate (the over-quota rate).

Technical analysis A method of exchange rate forecasting that involves the use of historical exchange rate data to estimate future values.

Technology transfer The transfer to other nations of knowledge and skills applied to how goods are produced.

Terms of trade The relative prices at which two products are traded in the marketplace.

Terms-of-trade effect The tariff revenue extracted from foreign producers in the form of a lower supply price.

Theory of overlapping demands Nations with similar per capita incomes will have overlapping demand structures and will likely consume similar types of manufactured goods; wealthy nations will likely trade with other wealthy nations, and poor nations will likely trade with other poor nations.

Theory of reciprocal demand Relative demand conditions determine what the actual terms of trade will be within the outer limits of the terms of trade.

Three-point arbitrage A more intricate form of arbitrage, involving three currencies and three financial centers; also called triangular arbitrage.

Tokyo Round Round of talks between GATT members from 1973 to 1979, in which signatory nations agreed to tariff cuts that took the across-the-board form initiated in the Kennedy Round.

Trade adjustment assistance Government assistance granted to domestic workers displaced by increased imports.

Trade balance Derived by computing the net exports (imports) in the merchandise accounts; also called merchandise trade balance.

Trade creation effect A welfare gain resulting from increasing trade caused by the formation of a regional trade bloc.

Trade diversion effect A welfare loss resulting from the formation of a regional trade bloc; it occurs when imports from a low-cost supplier outside the trade bloc are replaced by purchases from a higher-cost supplier within the trade bloc.

Trade promotion authority (also known as fast-track authority) devised in 1974, this provision commits the U.S. Congress to consider trade agreements without amendment; in return, the president must adhere to a specified timetable and several other procedures.

Trade remedy laws Laws designed to produce a fair trading environment for all parties engaging in international business; these laws include the escape clause, countervailing duties, antidumping duties, and unfair trading practices.

Trade triangle An area in a production possibilities diagram showing a country's exports, imports, and equilibrium terms of trade.

Trade-weighted dollar A weighted average of the exchange rates between a domestic currency and the currencies of the nation's

most important trading partners, with weights given by relative importance of the nation's trade with each trade partner.

Trading possibilities line A line in a production possibilities diagram representing the equilibrium terms-of-trade ratio.

Transfer pricing A technique where an MNE reports most of its profits in a low-tax country, even though the profits are earned in a high-tax country.

Transplants The assembly plants of Japanese companies that produce automobiles in the United States.

Transportation costs The costs of moving goods from one nation to another.

Two-point arbitrage The simultaneous purchase and sale of a currency in two foreign exchange markets in order to profit from exchange rate differentials in different locations.

U

Uncovered interest arbitrage When an investor does not obtain exchange market cover to protect investment proceeds from foreign currency fluctuations.

Unilateral transfers Include transfers of goods and services (gifts in kind) or financial assets (money gifts) between the United States and the rest of the world.

Uruguay Round Round of talks between GATT members from 1986 to 1993 in which across-the-board tariff cuts for industrial countries averaged 40 percent.

V

Variable levies An import tariff that increases or decreases as domestic or world prices change to guarantee that the price of the imported product after payment of duty will equal a predetermined price.

Vertical integration In the case of an MNE, occurs when the parent MNE decides to establish foreign subsidiaries to produce intermediate goods or inputs that go into the production of the finished good.

W

Wage and price controls Intervention by the government to set price and wage levels.

World Bank An international organization that provides loans to developing countries aimed toward poverty reduction and economic development.

World Trade Organization (WTO) Organization that embodies the main provisions of GATT, but its role was expanded to include a mechanism intended to improve GATT's process for resolving trade disputes among member nations.



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