part three

The Global Trade and Investment Environment

The Ecuadorian Rose Industry

It is 6:20 AM, February 7, in the Ecuadorian town of Cayambe, and Maria Pacheco has just been dropped off for work by the company bus. She pulls on thick rubber gloves, wraps an apron over her white, traditional embroidered dress, and grabs her clippers, ready for another long day. Any other time of year, Maria would work until 2 PM, but it's a week before Valentine's Day, and Maria along with her 84 coworkers at the farm are likely to be busy until 5 PM. By then, Maria will have cut more than 1,000 rose stems.

A few days later, after they have been refrigerated and shipped via aircraft, the roses Maria cut will be selling for premium prices in stores from New York to London. Ecuadorian roses are quickly becoming the Rolls Royce of roses. They have huge heads and unusually vibrant colors, including 10 different reds, from bleeding heart crimson to a rosy lover's blush.

Most of Ecuador's 460 or so rose farms are located in the Cayambe and Cotopaxi regions, 10,000 feet up in the Andes about an hour's drive from the capital, Quito. The rose bushes are planted in huge flat fields at the foot of snowcapped volcanoes that rise to more than 20,000 feet. The bushes are protected by 20-foot-high canopies of plastic sheeting. The combination of intense sunlight, fertile volcanic soil, an equatorial location, and high altitude makes for ideal growing conditions, allowing roses to flower almost year-round. Ecuador apparently has a comparative advantage in the production of roses.

Ecuador's rose industry started some 20 years ago and has been expanding rapidly since. Ecuador is now the world's fourth largest producer of roses. Roses are the nation's fifth largest export, with customers all over the world. Rose farms generate $240 million in sales and support tens of thousands of jobs. In Cayambe, the population has increased in 10 years from 10,000 to 70,000, primarily as a result of the rose industry. The revenues and taxes from rose growers have helped to pave roads, build schools, and construct sophisticated irrigation systems.

Maria works Monday to Saturday, and earns $210 a month, which she says is an average wage in Ecuador and substantially above the country's $120 a month

International Trade Theory

5

LEARNING OBJECTIVES:

After you have read this chapter you should:

LO1 Understand why nations trade with each other.

LO2 Be familiar with the different theories explaining trade flows between nations.

LO3 Understand why many economists believe that unrestricted free trade between nations will raise the economic welfare of countries that participate in a free trade system.

LO4 Be familiar with the arguments of those who maintain that government can play a proactive role in promoting national competitive advantage in certain industries.

LO5 Understand the important implications that international trade theory holds for business practice.

minimum wage. The farm also provides her with health care and a pension. By employing women such as Maria, the industry has fostered a social revolution in which mothers and wives have more control over their family's spending, especially on schooling for their children.

For all of the benefits that roses have bought to Ecuador, where the gross national income per capita is only $1,080 a year, the industry has come under fire from environmentalists. Large growers have been accused of misusing a toxic mixture of pesticides, fungicides, and fumigants to grow and export unblemished pest-free flowers. Reports claim that workers often fumigate roses in street clothes without protective equipment. Some doctors and scientists claim that many of the industry's 50,000 employees have serious health problems as a result of exposure to toxic chemicals. A study by the International Labor Organization claimed that women in the industry had more miscarriages than average and that some 60 percent of all workers suffered from headaches, nausea, blurred vision, and fatigue. Still, the critics acknowledge that their studies have been hindered by a lack of access to the farms, and they do not know what the true situation is. The International Labor Organization has also claimed that some rose growers in Ecuador use child labor, a claim that has been strenuously rejected by both the growers and Ecuadorian government agencies.

In Europe, consumer groups have urged the European Union to press for improved environmental safeguards. In response, some Ecuadorian growers have joined a voluntary program aimed at helping customers identify responsible growers. The certification signifies that the grower has distributed protective gear, trained workers in using chemicals, and hired doctors to visit workers at least weekly. Other environmental groups have pushed for stronger sanctions, including trade sanctions, against Ecuadorian rose growers that are not environmentally certified by a reputable agency. On February 14, however, most consumers are oblivious to these issues; they simply want to show their appreciation to their wives and girlfriends with a perfect bunch of roses.[1]

Introduction

The Ecuadorian rose industry is a striking example of the benefits of free trade and globalization. Lower barriers to trade have allowed Ecuador to exploit its comparative advantage in the growing of roses and enabled the country to emerge as one of the largest exporters of roses in the world. This benefits Ecuador, where economic growth and personal incomes have been bolstered by the emergence of the rose growing industry. It also benefits consumers in developed nations, who now have access to affordable high-quality roses from Ecuador. February is not exactly the best time for growing roses in New York state, but thanks to free trade, a New Yorker can now buy a bunch of fresh roses for his beloved on February 14 that were picked in Ecuador only 24 hours earlier. It also benefits foreigners who export goods and services to Ecuador, for a stronger Ecuadorian economy can purchase more of those goods and services. If there are losers in this process, they are high-cost rose producers in places like Florida, who have lost business to the Ecuadorians. In the world of international trade, there are always winners and losers, but as economists have long argued, the benefits to the winners outweigh the costs borne by the losers, resulting in a net gain to society. Moreover, economists argue that in the long run free trade stimulates economic growth and raises living standards across the board.

The economic arguments surrounding the benefits and costs of free trade in goods and services are not abstract academic ones. International trade theory has shaped the economic policy of many nations for the past 50 years. It was the driver behind the formation of the World Trade Organization and regional trade blocs such as the European Union and the North American Free Trade Agreement (NAFTA). The 1990s, in particular, saw a global move toward greater free trade. It is crucially important to understand, therefore, what these theories are and why they have been so successful in shaping the economic policy of so many nations and the competitive environment in which international businesses compete.

This chapter has two goals that go to the heart of the debate over the benefits and costs of free trade. The first is to review a number of theories that explain why it is beneficial for a country to engage in international trade. The second goal is to explain the pattern of international trade that we observe in the world economy. With regard to the pattern of trade, we will be primarily concerned with explaining the pattern of exports and imports of goods and services between countries. We will not be concerned with the pattern of foreign direct investment between countries; that is discussed in Chapter 7.

An Overview of Trade Theory

We open this chapter with a discussion of mercantilism. Propagated in the 16th and 17th centuries, mercantilism advocated that countries should simultaneously encourage exports and discourage imports. Although mercantilism is an old and largely discredited doctrine, its echoes remain in modern political debate and in the trade policies of many countries. Next we will look at Adam Smith's theory of absolute advantage. Proposed in 1776, Smith's theory was the first to explain why unrestricted free trade is beneficial to a country. **Free trade** refers to a situation where a government does not attempt to influence through quotas or duties what its citizens can buy from another country, or what they can produce and sell to another country. Smith argued that the invisible hand of the market mechanism, rather than government policy, should determine what a country imports and what it exports. His arguments imply that such a laissez-faire stance toward trade was in the best interests of a country. Building on Smith's work are two additional theories that we shall review. One is the theory of comparative advantage, advanced by the 19th-century English economist David Ricardo. This theory is the intellectual basis of the modern argument for unrestricted free trade. In the 20th century, Ricardo's work was refined by two Swedish economists, Eli Heckscher and Bertil Ohlin, whose theory is known as the Heckscher-Ohlin theory.

THE BENEFITS OF TRADE

The great strength of the theories of Smith, Ricardo, and Heckscher-Ohlin is that they identify with precision the specific benefits of international trade. Common sense suggests that some international trade is beneficial. For example, nobody would suggest that Iceland should grow its own oranges. Iceland can benefit from trade by exchanging some of the products that it can produce at a low cost (fish) for some products that it cannot produce at all (oranges). Thus, by engaging in international trade, Icelanders are able to add oranges to their diet of fish.

The theories of Smith, Ricardo, and Heckscher-Ohlin go beyond this commonsense notion, however, to show why it is beneficial for a country to engage in international trade *even for products it is able to produce for itself*. This is a difficult concept for people to grasp. For example, many people in the United States believe that American consumers should buy products made in the United States by American companies whenever possible to help save American jobs from foreign competition. The same kind of nationalistic sentiments can be observed in many other countries.

However, the theories of Smith, Ricardo, and Heckscher-Ohlin tell us that a country's economy may gain if its citizens buy certain products from other nations that could be produced at home. The gains arise because international trade allows a country to specialize in the manufacture and export of products that can be produced most efficiently in that country, while importing products that can be produced more efficiently in other countries. Thus it may make sense for the United States to specialize in the production and export of commercial jet aircraft since the efficient production of commercial jet aircraft requires resources that are abundant in the United States, such as a highly skilled labor force and cutting-edge technological know-how. On the other hand, it may make sense for the United States to import textiles from China since the efficient production of textiles requires a relatively cheap labor force—and cheap labor is not abundant in the United States.

Of course, this economic argument is often difficult for segments of a country's population to accept. With their future threatened by imports, U.S. textile companies and their employees have tried hard to persuade the government to limit the importation of textiles by demanding quotas and tariffs. Although such import controls may benefit particular groups, such as textile businesses and their employees, the theories of Smith, Ricardo, and Heckscher-Ohlin suggest that such action hurts the economy as a whole. Limits on imports are often in the interests of domestic producers, but not domestic consumers.

THE PATTERN OF INTERNATIONAL TRADE

The theories of Smith, Ricardo, and Heckscher-Ohlin help to explain the pattern of international trade that we observe in the world economy. Some aspects of the pattern are easy to understand. Climate and natural resource endowments explain why Ghana exports cocoa, Brazil exports coffee, Saudi Arabia exports oil, and China exports crawfish. However, much of the observed pattern of international trade is more difficult to explain. For example, why does Japan export automobiles, consumer electronics, and machine tools? Why does Switzerland export chemicals, pharmaceuticals, watches, and jewelry? David Ricardo's theory of comparative advantage offers an explanation in terms of international differences in labor productivity. The more sophisticated Heckscher-Ohlin theory emphasizes the interplay between the proportions in which the factors of production (such as land, labor, and capital) are available in different countries and the proportions in which they are needed for producing particular goods. This explanation rests on the assumption that countries have varying endowments of the various factors of production. Tests of this theory, however, suggest that it is a less powerful explanation of real-world trade patterns than once thought.

One early response to the failure of the Heckscher-Ohlin theory to explain the observed pattern of international trade was the product life-cycle theory. Proposed by

Raymond Vernon, this theory suggests that early in their life cycle, most new products are produced in and exported from the country in which they were developed. As a new product becomes widely accepted internationally, however, production starts in other countries. As a result, the theory suggests, the product may ultimately be exported back to the country of its original innovation.

In a similar vein, during the 1980s economists such as Paul Krugman developed what has come to be known as the new trade theory. **New trade theory** stresses that in some cases countries specialize in the production and export of particular products not because of underlying differences in factor endowments, but because in certain industries the world market can support only a limited number of firms. (This is argued to be the case for the commercial aircraft industry.) In such industries, firms that enter the market first are able to build a competitive advantage that is subsequently difficult to challenge. Thus, the observed pattern of trade between nations may be due in part to the ability of firms within a given nation to capture first-mover advantages. The United States is a major exporter of commercial jet aircraft because American firms such as Boeing were first movers in the world market. Boeing built a competitive advantage that has subsequently been difficult for firms from countries with equally favorable factor endowments to challenge (although Europe's Airbus Industries has succeeded in doing that). In a work related to the new trade theory, Michael Porter developed a theory referred to as the theory of national competitive advantage. This attempts to explain why particular nations achieve international success in particular industries. In addition to factor endowments, Porter points out the importance of country factors such as domestic demand and domestic rivalry in explaining a nation's dominance in the production and export of particular products.

TRADE THEORY AND GOVERNMENT POLICY

Although all these theories agree that international trade is beneficial to a country, they lack agreement in their recommendations for government policy. Mercantilism makes a crude case for government involvement in promoting exports and limiting imports. The theories of Smith, Ricardo, and Heckscher-Ohlin form part of the case for unrestricted free trade. The argument for unrestricted free trade is that both import controls and export incentives (such as subsidies) are self-defeating and result in wasted resources. Both the new trade theory and Porter's theory of national competitive advantage can be interpreted as justifying some limited government intervention to support the development of certain export-oriented industries. We will discuss the pros and cons of this argument, known as strategic trade policy, as well as the pros and cons of the argument for unrestricted free trade, in Chapter 6.

Mercantilism

The first theory of international trade, mercantilism, emerged in England in the mid-16th century. The principal assertion of mercantilism was that gold and silver were the mainstays of national wealth and essential to vigorous commerce. At that time, gold and silver were the currency of trade between countries; a country could earn gold and silver by exporting goods. Conversely, importing goods from other countries would result in an outflow of gold and silver to those countries. The main tenet of **mercantilism** was that it was in a country's best interests to maintain a trade surplus, to export more than it imported. By doing so, a country would accumulate gold and silver and, consequently, increase its national wealth, prestige, and power. As the English mercantilist writer Thomas Mun put it in 1630:

> The ordinary means therefore to increase our wealth and treasure is by foreign trade, wherein we must ever observe this rule: to sell more to strangers yearly than we consume of theirs in value.[2]

Consistent with this belief, the mercantilist doctrine advocated government intervention to achieve a surplus in the balance of trade. The mercantilists saw no virtue in a

large volume of trade. Rather, they recommended policies to maximize exports and minimize imports. To achieve this, imports were limited by tariffs and quotas, while exports were subsidized.

The classical economist David Hume pointed out an inherent inconsistency in the mercantilist doctrine in 1752. According to Hume, if England had a balance-of-trade surplus with France (it exported more than it imported), the resulting inflow of gold and silver would swell the domestic money supply and generate inflation in England. In France, however, the outflow of gold and silver would have the opposite effect. France's money supply would contract, and its prices would fall. This change in relative prices between France and England would encourage the French to buy fewer English goods (because they were becoming more expensive) and the English to buy more French goods (because they were becoming cheaper). The result would be deterioration in the English balance of trade and an improvement in France's trade balance, until the English surplus was eliminated. Hence, according to Hume, in the long run no country could sustain a surplus on the balance of trade and so accumulate gold and silver as the mercantilists had envisaged.

The flaw with mercantilism was that it viewed trade as a zero-sum game. (A **zero-sum game** is one in which a gain by one country results in a loss by another.) It was left to Adam Smith and David Ricardo to show the shortsightedness of this approach and to demonstrate that trade is a positive-sum game, or a situation in which all countries can benefit. Unfortunately, the mercantilist doctrine is by no means dead. Neo-mercantilists equate political power with economic power and economic power with a balance-of-trade surplus. Critics argue that many nations have adopted a neo-mercantilist strategy that is designed to simultaneously boost exports and limit imports.[3] For example, critics charge that China is pursuing a neo-mercantilist policy, deliberately keeping its currency value low against the U.S. dollar in order to sell more goods to the United States, and thus amass a trade surplus and foreign exchange reserves (see the Country Focus).

Absolute Advantage

In his 1776 landmark book *The Wealth of Nations*, Adam Smith attacked the mercantilist assumption that trade is a zero-sum game. Smith argued that countries differ in their ability to produce goods efficiently. In his time, the English, by virtue of their superior manufacturing processes, were the world's most efficient textile manufacturers. Due to the combination of favorable climate, good soils, and accumulated expertise, the French had the world's most efficient wine industry. The English had an *absolute advantage* in the production of textiles, while the French had an *absolute advantage* in the production of wine. Thus, a country has an **absolute advantage** in the production of a product when it is more efficient than any other country in producing it.

According to Smith, countries should specialize in the production of goods for which they have an absolute advantage and then trade these for goods produced by other countries. In Smith's time, this suggested that the English should specialize in the production of textiles while the French should specialize in the production of wine. England could get all the wine it needed by selling its textiles to France and buying wine in exchange. Similarly, France could get all the textiles it needed by selling wine to England and buying textiles in exchange. Smith's basic argument, therefore, is that a country should never produce goods at home that it can buy at a lower cost from other countries. Smith demonstrates that, by specializing in the production of goods in which each has an absolute advantage, both countries benefit by engaging in trade.

Consider the effects of trade between two countries, Ghana and South Korea. The production of any good (output) requires resources (inputs) such as land, labor, and capital. Assume that Ghana and South Korea both have the same amount of resources and that these resources can be used to produce either rice or cocoa. Assume further that 200 units of resources are available in each country. Imagine that in Ghana it takes

COUNTRY FOCUS

Is China a Neo-Mercantilist Nation?

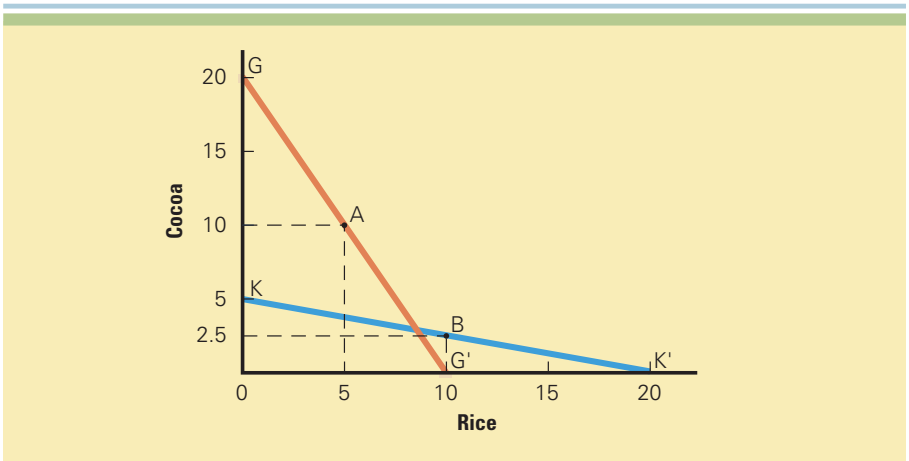
China's rapid rise in economic power has been built on export-led growth. The country has taken raw material imports from other countries and, using its cheap labor, converted them into products that it sells to developed nations like the United States. For years, the country's exports have been growing faster than its imports, leading some critics to claim that China is pursuing a neo-mercantilist policy, trying to amass record trade surpluses and foreign currency that will give it economic power over developed nations. This rhetoric reached new heights in 2006 when China's trade surplus hit a record $210 billion and its foreign exchange reserves exceeded $1 trillion, some 70 percent of which are held in U.S. dollars. Observers worry that if China ever decides to sell its holdings of U.S. currency, this could depress the value of the dollar against other currencies and increase the price of imports into America.

Throughout 2005 and 2006, China's exports grew much faster than its imports, leading some to argue that China was limiting imports by pursuing an import substitution policy, encouraging domestic investment in the production of products like steel, aluminum, and paper, which it had historically imported from other nations. The trade deficit with America has been a particular cause for concern. In 2006, this reached $214 billion, the largest deficit ever recorded with a single country. At the same time, China has resisted attempts to let its currency float freely against the U.S. dollar. Many claim that China's currency is too cheap, and that this keeps the prices of China's goods artificially low, which fuels the country's exports.

So is China a neo-mercantilist nation that is deliberately discouraging imports and encouraging exports in order to grow its trade surplus and accumulate foreign exchange reserves, which might give it economic power? The jury is out on this issue. Skeptics suggest that the slowdown in imports to China is temporary and that the country will have no choice but to increase its imports of commodities that it lacks, such as oil. They also note that China did start allowing the value of the *renminbi* (China's currency) to appreciate against the dollar in July 2005, although the initial appreciation was limited to just 2.1 percent—hardly enough, say critics. In a sign that pressure on China to change its ways is growing, in late 2006 U.S. Treasury Secretary Henry Paulson visited Beijing and called for the Chinese to allow the renminbi to continue rising against the U.S. dollar. The Chinese responded by making it clear that they had no intention of being hurried on the road to economic reform [4]

FIGURE 5.1

The Theory of Absolute Advantage



10 resources to produce one ton of cocoa and 20 resources to produce one ton of rice. Thus, Ghana could produce 20 tons of cocoa and no rice, 10 tons of rice and no cocoa, or some combination of rice and cocoa between these two extremes. The different combinations that Ghana could produce are represented by the line GG′ in Figure 5.1. This is referred to as Ghana's *production possibility frontier* (PPF). Similarly, imagine that in

South Korea it takes 40 resources to produce 1 ton of cocoa and 10 resources to produce 1 ton of rice. Thus, South Korea could produce 5 tons of cocoa and no rice, 20 tons of rice and no cocoa, or some combination between these two extremes. The different combinations available to South Korea are represented by the line KK′ in Figure 5.1, which is South Korea's PPF. Clearly, Ghana has an absolute advantage in the production of cocoa. (More resources are needed to produce a ton of cocoa in South Korea than in Ghana.) By the same token, South Korea has an absolute advantage in the production of rice.

Now consider a situation in which neither country trades with any other. Each country devotes half its resources to the production of rice and half to the production of cocoa. Each country must also consume what it produces. Ghana would be able to produce 10 tons of cocoa and 5 tons of rice (point A in Figure 5.1), while South Korea would be able to produce 10 tons of rice and 2.5 tons of cocoa. Without trade, the combined production of both countries would be 12.5 tons of cocoa (10 tons in Ghana plus 2.5 tons in South Korea) and 15 tons of rice (5 tons in Ghana and 10 tons in South Korea). If each country were to specialize in producing the good for which it had an absolute advantage and then trade with the other for the good it lacks, Ghana could produce 20 tons of cocoa, and South Korea could produce 20 tons of rice. Thus, by specializing, the production of both goods could be increased. Production of cocoa would increase from 12.5 tons to 20 tons, while production of rice would increase from 15 tons to 20 tons. The increase in production that would result from specialization is therefore 7.5 tons of cocoa and 5 tons of rice. Table 5.1 summarizes these figures.

TABLE 5.1

Absolute Advantage and the Gains from Trade

Resources Required to Produce 1 Ton of Cocoa and Rice		
	Cocoa	**Rice**
Ghana	10	20
South Korea	40	10
Production and Consumption without Trade		
	Cocoa	**Rice**
Ghana	10.0	5.0
South Korea	2.5	10.0
Total production	12.5	15.0
Production with Specialization		
	Cocoa	**Rice**
Ghana	20.0	0.0
South Korea	0.0	20.0
Total production	20.0	20.0
Consumption After Ghana Trades 6 Tons of Cocoa for 6 Tons of South Korean Rice		
	Cocoa	**Rice**
Ghana	14.0	6.0
South Korea	6.0	14.0
Increase in Consumption as a Result of Specialization and Trade		
	Cocoa	**Rice**
Ghana	4.0	1.0
South Korea	3.5	4.0

By engaging in trade and swapping 1 ton of cocoa for 1 ton of rice, producers in both countries could consume more of both cocoa and rice. Imagine that Ghana and South Korea swap cocoa and rice on a one-to-one basis; that is, the price of 1 ton of cocoa is equal to the price of 1 ton of rice. If Ghana decided to export 6 tons of cocoa to South Korea and import 6 tons of rice in return, its final consumption after trade would be 14 tons of cocoa and 6 tons of rice. This is 4 tons more cocoa than it could have consumed before specialization and trade and 1 ton more rice. Similarly, South Korea's final consumption after trade would be 6 tons of cocoa and 14 tons of rice. This is 3.5 tons more cocoa than it could have consumed before specialization and trade and 4 tons more rice. Thus, as a result of specialization and trade, output of both cocoa and rice would be increased, and consumers in both nations would be able to consume more. Thus, we can see that trade is a positive-sum game; it produces net gains for all involved.

Comparative Advantage

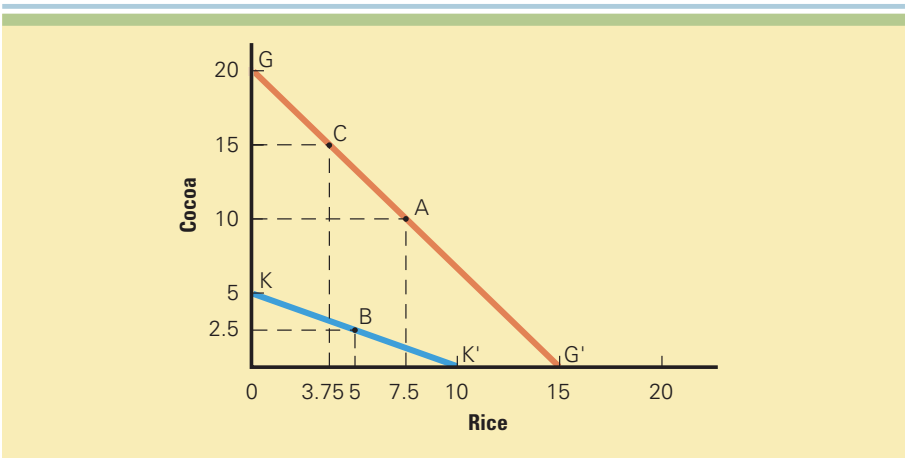
David Ricardo took Adam Smith's theory one step further by exploring what might happen when one country has an absolute advantage in the production of all goods.[5] Smith's theory of absolute advantage suggests that such a country might derive no benefits from international trade. In his 1817 book *Principles of Political Economy,* Ricardo showed that this was not the case. According to Ricardo's theory of comparative advantage, it makes sense for a country to specialize in the production of those goods that it produces most efficiently and to buy the goods that it produces less efficiently from other countries, even if this means buying goods from other countries that it could produce more efficiently itself.[6] While this may seem counterintuitive, the logic can be explained with a simple example.

Assume that Ghana is more efficient in the production of both cocoa and rice; that is, Ghana has an absolute advantage in the production of both products. In Ghana it takes 10 resources to produce 1 ton of cocoa and 13⅓ resources to produce one ton of rice. Thus, given its 200 units of resources, Ghana can produce 20 tons of cocoa and no rice, 15 tons of rice and no cocoa, or any combination in between on its PPF (the line GG′ in Figure 5.2). In South Korea it takes 40 resources to produce 1 ton of cocoa and 20 resources to produce one ton of rice. Thus, South Korea can produce 5 tons of cocoa and no rice, 10 tons of rice and no cocoa, or any combination on its PPF (the line KK′ in Figure 5.2). Again assume that without trade, each country uses half of its resources to produce rice and half to produce cocoa. Thus, without trade, Ghana will produce 10 tons of cocoa and 7.5 tons of rice (point A in Figure 5.2), while South Korea will produce 2.5 tons of cocoa and 5 tons of rice (point B in Figure 5.2).

In light of Ghana's absolute advantage in the production of both goods, why should it trade with South Korea? Although Ghana has an absolute advantage in the

FIGURE 5.2

The Theory of Comparative Advantage



production of both cocoa and rice, it has a comparative advantage only in the production of cocoa: Ghana can produce 4 times as much cocoa as South Korea, but only 1.5 times as much rice. Ghana is *comparatively* more efficient at producing cocoa than it is at producing rice.

Without trade, the combined production of cocoa will be 12.5 tons (10 tons in Ghana and 2.5 in South Korea), and the combined production of rice will also be 12.5 tons (7.5 tons in Ghana and 5 tons in South Korea). Without trade, each country must consume what it produces. By engaging in trade, the two countries can increase their combined production of rice and cocoa, and consumers in both nations can consume more of both goods.

THE GAINS FROM TRADE

Imagine that Ghana exploits its comparative advantage in the production of cocoa to increase its output from 10 tons to 15 tons. This uses up 150 units of resources, leaving the remaining 50 units of resources to use in producing 3.75 tons of rice (point C in Figure 5.2). Meanwhile, South Korea specializes in the production of rice, producing 10 tons. The combined output of both cocoa and rice has now increased. Before specialization, the combined output was 12.5 tons of cocoa and 12.5 tons of rice. Now it is 15 tons of cocoa and 13.75 tons of rice (3.75 tons in Ghana and 10 tons in South Korea). The source of the increase in production is summarized in Table 5.2.

TABLE 5.2
Comparative Advantage and the Gains from Trade

Resources Required to Produce 1 Ton of Cocoa and Rice		
	Cocoa	**Rice**
Ghana	10	13.33
South Korea	40	20
Production and Consumption without Trade		
	Cocoa	**Rice**
Ghana	10.0	7.5
South Korea	2.5	5.0
Total production	12.5	12.5
Production with Specialization		
	Cocoa	**Rice**
Ghana	15.0	3.75
South Korea	0.0	10.0
Total production	15.0	13.75
Consumption After Ghana Trades 6 Tons of Cocoa for 6 Tons of South Korean Rice		
	Cocoa	**Rice**
Ghana	11.0	7.75
South Korea	4.0	6.0
Increase in Consumption as a Result of Specialization and Trade		
	Cocoa	**Rice**
Ghana	1.0	0.25
South Korea	1.5	1.0

Not only is output higher, but both countries also can now benefit from trade. If Ghana and South Korea swap cocoa and rice on a one-to-one basis, with both countries choosing to exchange 4 tons of their export for 4 tons of the import, both countries are able to consume more cocoa and rice than they could before specialization and trade (see Table 5.2). Thus, if Ghana exchanges 4 tons of cocoa with South Korea for 4 tons of rice, it is still left with 11 tons of cocoa, which is 1 ton more than it had before trade. The 4 tons of rice it gets from South Korea in exchange for its 4 tons of cocoa, when added to the 3.75 tons it now produces domestically, leave it with a total of 7.75 tons of rice, which is .25 of a ton more than it had before specialization. Similarly, after swapping 4 tons of rice with Ghana, South Korea still ends up with 6 tons of rice, which is more than it had before specialization. In addition, the 4 tons of cocoa it receives in exchange is 1.5 tons more than it produced before trade. Thus, consumption of cocoa and rice can increase in both countries as a result of specialization and trade.

The basic message of the theory of comparative advantage is that *potential world production is greater with unrestricted free trade than it is with restricted trade*. Ricardo's theory suggests that consumers in all nations can consume more if there are no restrictions on trade. This occurs even in countries that lack an absolute advantage in the production of any good. In other words, to an even greater degree than the theory of absolute advantage, *the theory of comparative advantage suggests that trade is a positive-sum game in which all countries that participate realize economic gains*. As such, this theory provides a strong rationale for encouraging free trade. So powerful is Ricardo's theory that it remains a major intellectual weapon for those who argue for free trade.

QUALIFICATIONS AND ASSUMPTIONS

The conclusion that free trade is universally beneficial is a rather bold one to draw from such a simple model. Our simple model includes many unrealistic assumptions:

1. We have assumed a simple world in which there are only two countries and two goods. In the real world, there are many countries and many goods.
2. We have assumed away transportation costs between countries.
3. We have assumed away differences in the prices of resources in different countries. We have said nothing about exchange rates, simply assuming that cocoa and rice could be swapped on a one-to-one basis.
4. We have assumed that resources can move freely from the production of one good to another within a country. In reality, this is not always the case.
5. We have assumed constant returns to scale; that is, that specialization by Ghana or South Korea has no effect on the amount of resources required to produce 1 ton of cocoa or rice. In reality, both diminishing and increasing returns to specialization exist. The amount of resources required to produce a good might decrease or increase as a nation specializes in production of that good.
6. We have assumed that each country has a fixed stock of resources and that free trade does not change the efficiency with which a country uses its resources. This static assumption makes no allowances for the dynamic changes in a country's stock of resources and in the efficiency with which the country uses its resources that might result from free trade.
7. We have assumed away the effects of trade on income distribution within a country.

Given these assumptions, can the conclusion that free trade is mutually beneficial be extended to the real world of many countries, many goods, positive transportation costs, volatile exchange rates, immobile domestic resources, nonconstant returns to specialization, and dynamic changes? Although a detailed extension of the theory of comparative advantage is beyond the scope of this book, economists have shown that the basic result derived from our simple model can be generalized to a world composed of many countries

producing many different goods.[7] Despite the shortcomings of the Ricardian model, research suggests that the basic proposition that countries will export the goods that they are most efficient at producing is borne out by the data.[8]

However, once all the assumptions are dropped, some economists associated with the "new trade theory" argue that the case for unrestricted free trade, while still positive, loses some of its strength.[9] We return to this issue later in this chapter and in the next when we discuss the new trade theory. Moreover, in a recent and widely discussed analysis, the Nobel Prize–winning economist Paul Samuelson argued that contrary to the standard interpretation, in certain circumstances the theory of comparative advantage predicts that a rich country might actually be *worse* off by switching to a free trade regime with a poor nation.[10] We will consider Samuelson's critique in the next section.

EXTENSIONS OF THE RICARDIAN MODEL

Let us explore the effect of relaxing three of the assumptions identified above in the simple comparative advantage model. Below we relax the assumptions that resources move freely from the production of one good to another within a country, that there are constant returns to scale, and that trade does not change a country's stock of resources or the efficiency with which those resources are utilized.

Immobile Resources

In our simple comparative model of Ghana and South Korea, we assumed that producers (farmers) could easily convert land from the production of cocoa to rice, and vice versa. While this assumption may hold for some agricultural products, resources do not always shift quite so easily from producing one good to another. A certain amount of friction is involved. For example, embracing a free trade regime for an advanced economy such as the United States often implies that the country will produce less of some labor-intensive goods, such as textiles, and more of some knowledge-intensive goods, such as computer software or biotechnology products. Although the country as a whole will gain from such a shift, textile producers will lose. A textile worker in South Carolina is probably not qualified to write software for Microsoft. Thus, the shift to free trade may mean that she becomes unemployed or has to accept another less attractive job, such as working at a fast-food restaurant.

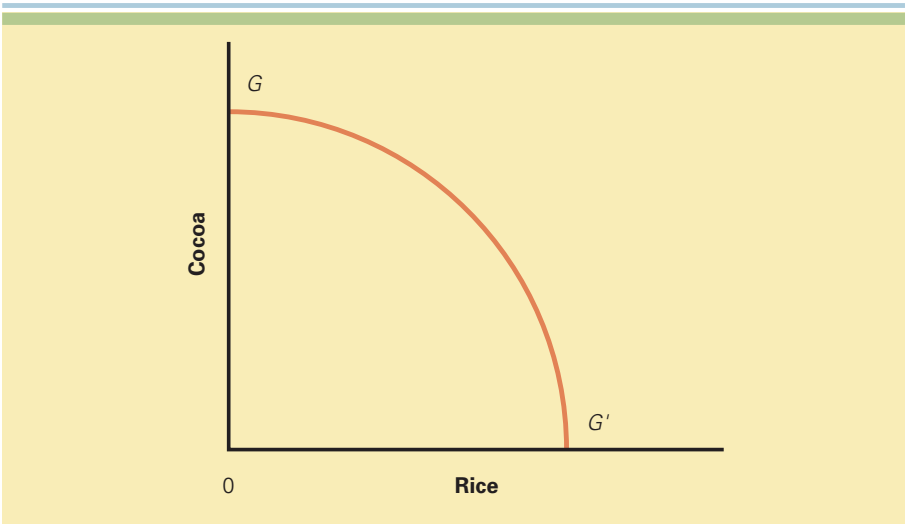
Resources do not always move easily from one economic activity to another. The process creates friction and human suffering too. While the theory predicts that the benefits of free trade outweigh the costs by a significant margin, this is of cold comfort to those who bear the costs. Accordingly, political opposition to the adoption of a free trade regime typically comes from those whose jobs are most at risk. In the United States, for example, textile workers and their unions have long opposed the move toward free trade precisely because this group has much to lose from free trade. Governments often ease the transition toward free trade by helping to retrain those who lose their jobs as a result. The pain caused by the movement toward a free trade regime is a short-term phenomenon, while the gains from trade once the transition has been made are both significant and enduring.

Diminishing Returns

The simple comparative advantage model developed above assumes constant returns to specialization. By **constant returns to specialization** we mean the units of resources required to produce a good (cocoa or rice) are assumed to remain constant no matter where one is on a country's production possibility frontier (PPF). Thus, we assumed that it always took Ghana 10 units of resources to produce 1 ton of cocoa. However, it is more realistic to assume diminishing returns to specialization. Diminishing returns to specialization occur when more units of resources are required to produce each additional unit. While 10 units of resources may be sufficient to increase Ghana's output of cocoa from 12 tons to 13 tons, 11 units of resources may be needed to increase output

FIGURE 5.3

Ghana's PPF under Diminishing Returns



from 13 to 14 tons, 12 units of resources to increase output from 14 tons to 15 tons, and so on. Diminishing returns imply a convex PPF for Ghana (see Figure 5.3), rather than the straight line depicted in Figure 5.2.

It is more realistic to assume diminishing returns for two reasons. First, not all resources are of the same quality. As a country tries to increase its output of a certain good, it is increasingly likely to draw on more marginal resources whose productivity is not as great as those initially employed. The result is that it requires ever more resources to produce an equal increase in output. For example, some land is more productive than other land. As Ghana tries to expand its output of cocoa, it might have to utilize increasingly marginal land that is less fertile than the land it originally used. As yields per acre decline, Ghana must use more land to produce 1 ton of cocoa.

A second reason for diminishing returns is that different goods use resources in different proportions. For example, imagine that growing cocoa uses more land and less labor than growing rice, and that Ghana tries to transfer resources from rice production to cocoa production. The rice industry will release proportionately too much labor and too little land for efficient cocoa production. To absorb the additional resources of labor and land, the cocoa industry will have to shift toward more labor-intensive methods of production. The effect is that the efficiency with which the cocoa industry uses labor will decline, and returns will diminish.

Diminishing returns show that it is not feasible for a country to specialize to the degree suggested by the simple Ricardian model outlined earlier. Diminishing returns to specialization suggest that the gains from specialization are likely to be exhausted before specialization is complete. In reality, most countries do not specialize but, instead, produce a range of goods. However, the theory predicts that it is worthwhile to specialize until that point where diminishing returns outweigh the resulting gains from trade. Thus, the basic conclusion that unrestricted free trade is beneficial still holds, although because of diminishing returns, the gains may not be as great as suggested in the constant returns case.

Dynamic Effects and Economic Growth

The simple comparative advantage model assumed that trade does not change a country's stock of resources or the efficiency with which it utilizes those resources. This static assumption makes no allowances for the dynamic changes that might result from trade. If we relax this assumption, it becomes apparent that opening an economy to trade is

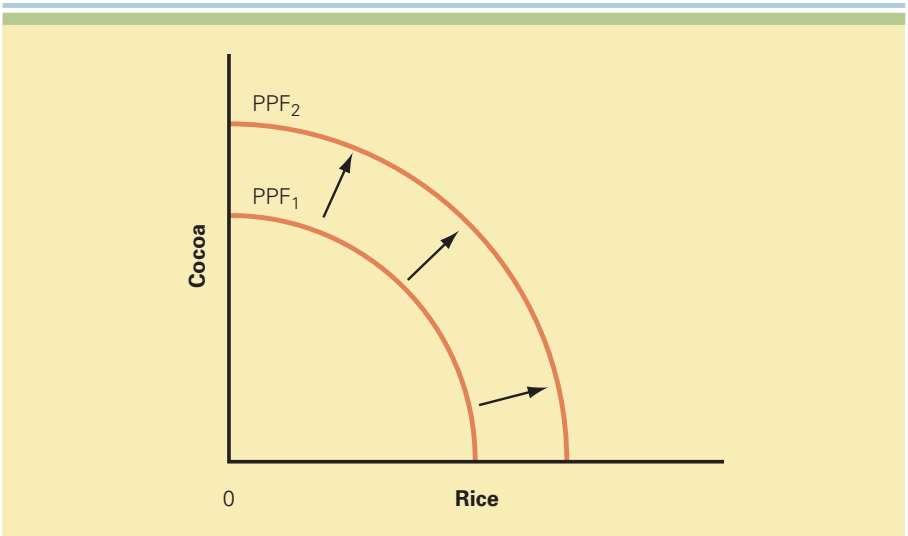


FIGURE 5.4
The Influence of Free Trade on the PPF

likely to generate dynamic gains of two sorts.[11] First, free trade might increase a country's stock of resources as increased supplies of labor and capital from abroad become available for use within the country. For example, more resources have become available in Eastern Europe since the early 1990s since many Western businesses have been investing significant capital in the former Communist countries.

Second, free trade might also increase the efficiency with which a country uses its resources. Gains in the efficiency of resource utilization could arise from a number of factors. For example, economies of large-scale production might become available as trade expands the size of the total market available to domestic firms. Trade might make better technology from abroad available to domestic firms; better technology can increase labor productivity or the productivity of land. (The so-called green revolution had this effect on agricultural outputs in developing countries.) Also, opening an economy to foreign competition might stimulate domestic producers to look for ways to increase their efficiency. Again, this phenomenon has arguably been occurring in the once-protected markets of Eastern Europe, where many former state monopolies have had to increase the efficiency of their operations to survive in the competitive world market.

Dynamic gains in both the stock of a country's resources and the efficiency with which resources are utilized will cause a country's PPF to shift outward. This is illustrated in Figure 5.4, where the shift from PPF_1 to PPF_2 results from the dynamic gains that arise from free trade. As a consequence of this outward shift, the country in Figure 5.4 can produce more of both goods than it did before introduction of free trade. The theory suggests that opening an economy to free trade not only results in static gains of the type discussed earlier but also results in dynamic gains that stimulate economic growth. If this is so, then one might think that the case for free trade becomes stronger still, and in general it does. However, as noted above, in a recent article one of the leading economic theorists of the 20th century, Paul Samuelson, argued that in some circumstances, dynamic gains can lead to an outcome that is not so beneficial.

The Samuelson Critique

Samuelson's critique looks at what happens when a rich country—the United States—enters into a free trade agreement with a poor country—China—that rapidly improves its productivity after the introduction of a free trade regime (that is, there is a dynamic gain in the efficiency with which resources are used in the poor country). The Samuelson model suggests that in such cases, the lower prices that U.S. consumers

pay for goods imported from China following the introduction of a free trade regime *may* not be enough to produce a net gain for the U.S. economy if the dynamic effect of free trade is to lower real wage rates in the United States. As Samuelson stated in a *New York Times* interview, "being able to purchase groceries 20 percent cheaper at Wal-Mart (due to international trade) does not necessarily make up for the wage losses (in America)."[12]

Samuelson goes on to note that he is particularly concerned about the ability to transfer service jobs offshore that traditionally were not internationally mobile, such as software debugging, call center jobs, accounting jobs, and even medical diagnosis of MRI scans (see the next Country Focus for details). Recent advances in communications technology have made this trend possible, effectively expanding the labor market for these jobs to include educated people in places like India, the Philippines, and China. When coupled with rapid advances in the productivity of foreign labor due to better education, the effect on middle class wages in the United States, according to Samuelson, may be similar to mass inward migration into the United States—it will lower the market clearing wage rate, *perhaps* by enough to outweigh the positive benefits of international trade.

Having said this, it should be noted that Samuelson concedes that free trade has historically benefited rich counties (as data discussed below seem to confirm). Moreover, he notes that introducing protectionist measures (e.g., trade barriers) to guard against the theoretical possibility that free trade may harm the United States in the future may produce a situation that is worse than the disease protectionists are trying to prevent. To quote Samuelson: "free trade may turn out pragmatically to be still best for each region in comparison to lobbyist induced tariffs and quotas which involve both a perversion of democracy and non-subtle deadweight distortion losses."[13]

Some economists have been quick to dismiss Samuelson's fears.[14] While not questioning his analysis, they note that as a practical matter developing nations are unlikely to be able to upgrade the skill level of their workforce rapidly enough to give rise to the situation in Samuelson's model. In other words, they will quickly run into diminishing returns. To quote one such rebuttal: "The notion that India and China will quickly educate 300 million of their citizens to acquire sophisticated and complex skills at stake borders on the ludicrous. The educational sectors in these countries face enormous difficulties."[15] Notwithstanding such rebuttals, however, Samuelson's stature is such that his work will undoubtedly be debated for some time to come.

Evidence for the Link between Trade and Growth

Many economic studies have looked at the relationship between trade and economic growth.[17] In general, these studies suggest that, as predicted by the standard theory of comparative advantage, countries that adopt a more open stance toward international trade enjoy higher growth rates than those that close their economies to trade (the opening case provides evidence of the link between trade and growth). Jeffrey Sachs and Andrew Warner created a measure of how "open" to international trade an economy was and then looked at the relationship between "openness" and economic growth for a sample of more than 100 countries from 1970 to 1990.[18] Among other findings, they reported:

> We find a strong association between openness and growth, both within the group of developing and the group of developed countries. Within the group of developing countries, the open economies grew at 4.49 percent per year, and the closed economies grew at 0.69 percent per year. Within the group of developed economies, the open economies grew at 2.29 percent per year, and the closed economies grew at 0.74 percent per year.[19]

A study by Wacziarg and Welch updated the Sachs and Warner data to the late 1990s. They found that over the period 1950–1998, countries that liberalized their trade regimes experienced, on average, increases in their annual growth rates of 1.5 percent compared to periods before liberalization.[20]

COUNTRY FOCUS

Moving U.S. White-Collar Jobs Offshore

Economists have long argued that free trade produces gains for all countries that participate in a free trading system, but as the next wave of globalization sweeps through the U.S. economy, many people are wondering if this is true, particularly those who stand to lose their jobs because of globalization. In the popular imagination for much of the past quarter century, free trade was associated with the movement of low-skill, blue-collar manufacturing jobs out of rich countries such as the United States and toward low-wage countries—textiles to Costa Rica, athletic shoes to the Philippines, steel to Brazil, electronic products to Malaysia, and so on. While many observers bemoaned the "hollowing out" of U.S. manufacturing, economists stated that high-skilled, high-wage white-collar jobs associated with the knowledge-based economy would stay in the United States. Computers might be assembled in Malaysia, so the argument went, but they would continue to be designed in Silicon Valley by highly skilled U.S. engineers.

Recent developments have some people questioning this assumption. As the global economy slowed after 2000 and corporate profits slumped, many American companies responded by moving white-collar "knowledge-based" jobs to developing nations where they could be performed for a fraction of the cost. During the long economic boom of the 1990s, Bank of America had to compete with other organizations for the scarce talents of information technology specialists, driving annual salaries to more than $100,000. However, with business under pressure, between 2002 and early 2003 the bank cut nearly 5,000 jobs from its 25,000-strong, U.S.-based information technology workforce. Some of these jobs were transferred to India, where work that costs $100 an hour in the United States can be done for $20 an hour.

One beneficiary of Bank of America's downsizing is Infosys Technologies Ltd., a Bangalore, India, information technology firm where 250 engineers now develop information technology applications for the bank. Other Infosys employees are busy processing home loan applications for Greenpoint Mortgage of Novato, California. Nearby in the offices of another Indian firm, Wipro Ltd., five radiologists interpret 30 CT scans a day for Massachusetts General Hospital, sent over the Internet. At yet another Bangalore business, engineers earn $10,000 a year designing leading-edge semiconductor chips for Texas Instruments. Nor is India the only beneficiary of these changes. Accenture, a large U.S. management consulting and information technology firm, moved 5,000 jobs in software development and accounting to the Philippines. Also in the Philippines, Procter & Gamble employs 650 professionals who prepare the company's global tax returns. The work used to be done in the United States, but now it is done in Manila, with just final submission to local tax authorities in the United States and other countries handled locally.

Some architectural work also is being outsourced to lower cost locations. Flour Corp., a California-based construction company, employs some 1,200 engineers and draftsmen in the Philippines, Poland, and India to turn layouts of industrial facilities into detailed specifications. For a Saudi Arabian chemical plant Flour is designing, 200 young engineers based in the Philippines earning less than $3,000 a year collaborate in real time over the Internet with elite U.S. and British engineers who make up to $90,000 a year. Why does Flour do this? According to the company, the answer is simple: It reduces the cost of a project by 15 percent, giving the company a cost-based competitive advantage in the global market for construction design.[16]

The message of these studies seems clear: Adopt an open economy and embrace free trade, and your nation will be rewarded with higher economic growth rates. Higher growth will raise income levels and living standards. This last point has been confirmed by a study that looked at the relationship between trade and growth in incomes. The study, undertaken by Jeffrey Frankel and David Romer, found that on average, a 1 percentage point increase in the ratio of a country's trade to its gross domestic product increases income per person by at least .5 percent.[21] For every 10 percent increase in the importance of international trade in an economy, average income levels will rise by at least 5 percent. Despite the short-term adjustment costs associated with adopting a free

trade regime, trade would seem to produce greater economic growth and higher living standards in the long run, just as Ricardo's theory would lead us to expect.[22]

Heckscher-Ohlin Theory

Ricardo's theory stresses that comparative advantage arises from differences in productivity. Thus, whether Ghana is more efficient than South Korea in the production of cocoa depends on how productively it uses its resources. Ricardo stressed labor productivity and argued that differences in labor productivity between nations underlie the notion of comparative advantage. Swedish economists Eli Heckscher (in 1919) and Bertil Ohlin (in 1933) put forward a different explanation of comparative advantage. They argued that comparative advantage arises from differences in national factor endowments.[23] By **factor endowments** they meant the extent to which a country is endowed with such resources as land, labor, and capital. Nations have varying factor endowments, and different factor endowments explain differences in factor costs; specifically, the more abundant a factor, the lower its cost. The Heckscher-Ohlin theory predicts that countries will export those goods that make intensive use of factors that are locally abundant, while importing goods that make intensive use of factors that are locally scarce. Thus, the Heckscher-Ohlin theory attempts to explain the pattern of international trade that we observe in the world economy. Like Ricardo's theory, the Heckscher-Ohlin theory argues that free trade is beneficial. Unlike Ricardo's theory, however, the Heckscher-Ohlin theory argues that the pattern of international trade is determined by differences in factor endowments, rather than differences in productivity.

The Heckscher-Ohlin theory has commonsense appeal. For example, the United States has long been a substantial exporter of agricultural goods, reflecting in part its unusual abundance of arable land. In contrast, China excels in the export of goods produced in labor-intensive manufacturing industries, such as textiles and footwear. This reflects China's relative abundance of low-cost labor. The United States, which lacks abundant low-cost labor, has been a primary importer of these goods. Note that it is relative, not absolute, endowments that are important; a country may have larger absolute amounts of land and labor than another country, but be relatively abundant in one of them.

THE LEONTIEF PARADOX

The Heckscher-Ohlin theory has been one of the most influential theoretical ideas in international economics. Most economists prefer the Heckscher-Ohlin theory to Ricardo's theory because it makes fewer simplifying assumptions. Because of its influence, the theory has been subjected to many empirical tests. Beginning with a famous study published in 1953 by Wassily Leontief (winner of the Nobel Prize in economics in 1973), many of these tests have raised questions about its validity.[24] Using the Heckscher-Ohlin theory, Leontief postulated that since the United States was relatively abundant in capital compared to other nations, the United States would be an exporter of capital-intensive goods and an importer of labor-intensive goods. To his surprise, however, he found that U.S. exports were less capital intensive than U.S. imports. Since this result was at variance with the predictions of the theory, it has become known as the Leontief paradox.

No one is quite sure why we observe the Leontief paradox. One possible explanation is that the United States has a special advantage in producing new products or goods made with innovative technologies. Such products may be less capital intensive than products whose technology has had time to mature and become suitable for mass production. Thus, the United States may be exporting goods that heavily use skilled labor and innovative entrepreneurship, such as computer software, while

importing heavy manufacturing products that use large amounts of capital. Some empirical studies tend to confirm this.[25] Still, tests of the Heckscher-Ohlin theory using data for a large number of countries tend to confirm the existence of the Leontief paradox.[26]

This leaves economists with a difficult dilemma. They prefer the Heckscher-Ohlin theory on theoretical grounds, but it is a relatively poor predictor of real-world international trade patterns. On the other hand, the theory they regard as being too limited, Ricardo's theory of comparative advantage, actually predicts trade patterns with greater accuracy. The best solution to this dilemma may be to return to the Ricardian idea that trade patterns are largely driven by international differences in productivity. Thus, one might argue that the United States exports commercial aircraft and imports textiles not because its factor endowments are especially suited to aircraft manufacture and not suited to textile manufacture, but because the United States is relatively more efficient at producing aircraft than textiles. A key assumption in the Heckscher-Ohlin theory is that technologies are the same across countries. This may not be the case. Differences in technology may lead to differences in productivity, which, in turn, drive international trade patterns.[27] Thus, Japan's success in exporting automobiles in the 1970s and 1980s was based not just on the relative abundance of capital but also on its development of innovative manufacturing technology that enabled it to achieve higher productivity levels in automobile production than other countries that also had abundant capital. More recent empirical work suggests that this theoretical explanation may be correct.[28] The new research shows that once differences in technology across countries are controlled for, countries do indeed export those goods that make intensive use of factors that are locally abundant, while importing goods that make intensive use of factors that are locally scarce. In other words, once the impact of differences of technology on productivity is controlled for, the Heckscher-Ohlin theory seems to gain predictive power.

The Product Life-Cycle Theory

Raymond Vernon initially proposed the product life-cycle theory in the mid-1960s.[29] Vernon's theory was based on the observation that for most of the 20th century a very large proportion of the world's new products had been developed by U.S. firms and sold first in the U.S. market (e.g., mass-produced automobiles, televisions, instant cameras, photocopiers, personal computers, and semiconductor chips). To explain this, Vernon argued that the wealth and size of the U.S. market gave U.S. firms a strong incentive to develop new consumer products. In addition, the high cost of U.S. labor gave U.S. firms an incentive to develop cost-saving process innovations.

Just because a new product is developed by a U.S. firm and first sold in the U.S. market, it does not follow that the product must be produced in the United States. It could be produced abroad at some low-cost location and then exported back into the United States. However, Vernon argued that most new products were initially produced in America. Apparently, the pioneering firms believed it was better to keep production facilities close to the market and to the firm's center of decision making, given the uncertainty and risks inherent in introducing new products. Also, the demand for most new products tends to be based on non-price factors. Consequently, firms can charge relatively high prices for new products, which obviates the need to look for low-cost production sites in other countries.

Vernon went on to argue that early in the life cycle of a typical new product, while demand is starting to grow rapidly in the United States, demand in other advanced countries is limited to high-income groups. The limited initial demand in other advanced countries does not make it worthwhile for firms in those countries to start producing the new product, but it does necessitate some exports from the United States to those countries.

Over time, demand for the new product starts to grow in other advanced countries (e.g., Great Britain, France, Germany, and Japan). As it does, it becomes worthwhile for foreign producers to begin producing for their home markets. In addition, U.S. firms might set up production facilities in those advanced countries where demand is growing. Consequently, production within other advanced countries begins to limit the potential for exports from the United States.

As the market in the United States and other advanced nations matures, the product becomes more standardized, and price becomes the main competitive weapon. As this occurs, cost considerations start to play a greater role in the competitive process. Producers based in advanced countries where labor costs are lower than in the United States (e.g., Italy, Spain) might now be able to export to the United States. If cost pressures become intense, the process might not stop there. The cycle by which the United States lost its advantage to other advanced countries might be repeated once more, as developing countries (e.g., Thailand) begin to acquire a production advantage over advanced countries. Thus, the locus of global production initially switches from the United States to other advanced nations and then from those nations to developing countries.

The consequence of these trends for the pattern of world trade is that over time the United States switches from being an exporter of the product to an importer of the product as production becomes concentrated in lower-cost foreign locations. Figure 5.5 shows the growth of production and consumption over time in the United States, other advanced countries, and developing countries.

EVALUATING THE PRODUCT LIFE-CYCLE THEORY

Historically, the product life-cycle theory seems to be an accurate explanation of international trade patterns. Consider photocopiers; the product was first developed in the early 1960s by Xerox in the United States and sold initially to U.S. users. Originally Xerox exported photocopiers from the United States, primarily to Japan and the advanced countries of Western Europe. As demand began to grow in those countries, Xerox entered into joint ventures to set up production in Japan (Fuji-Xerox) and Great Britain (Rank-Xerox). In addition, once Xerox's patents on the photocopier process expired, other foreign competitors began to enter the market (e.g., Canon in Japan, Olivetti in Italy). As a consequence, exports from the United States declined, and U.S. users began to buy some of their photocopiers from lower cost foreign sources, particularly Japan. More recently, Japanese companies have found that manufacturing costs are too high in their own country, so they have begun to switch production to developing countries such as Singapore and Thailand. Thus, initially the United States and now other advanced countries (e.g., Japan and Great Britain) have switched from being exporters of photocopiers to importers. This evolution in the pattern of international trade in photocopiers is consistent with the predictions of the product life-cycle theory that mature industries tend to go out of the United States and into low-cost assembly locations.

However, the product life-cycle theory is not without weaknesses. Viewed from an Asian or European perspective, Vernon's argument that most new products are developed and introduced in the United States seems ethnocentric. Although it may be true that during U.S. dominance of the global economy (from 1945 to 1975), most new products were introduced in the United States, there have always been important exceptions. These exceptions appear to have become more common in recent years. Many new products are now first introduced in Japan (e.g., video game consoles) or Europe (new wireless phones). Moreover, with the increased globalization and integration of the world economy discussed in Chapter 1, a growing number of new products (e.g., laptop computers, compact discs, and digital cameras) are now introduced simultaneously in the United States, Japan, and the advanced European nations. Global product introductions may be accompanied by globally dispersed production, with particular components of a new

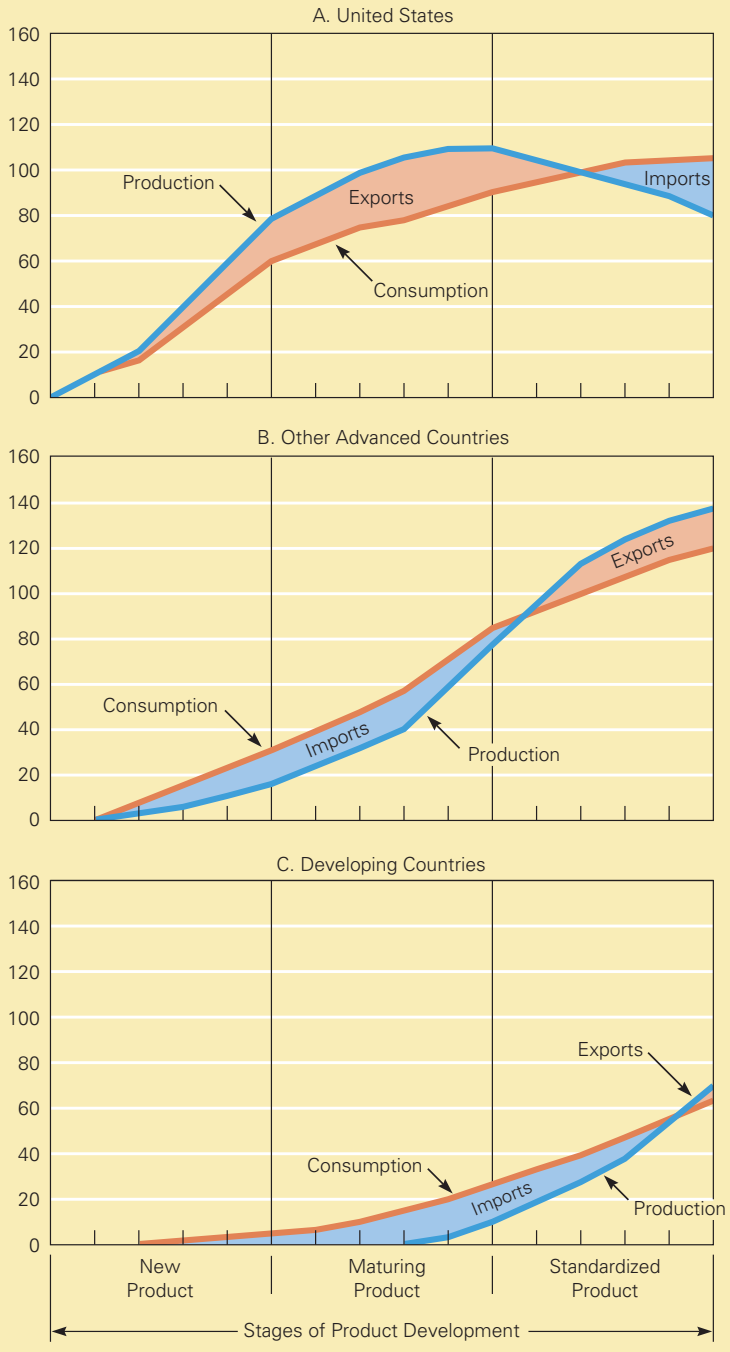


FIGURE 5.5

The Product Life Cycle Theory

Source: Adapted from R. Vernon and L. T. Wells, *The Economic Environment of International Business*, 4th ed., © 1986. Reprinted by permission of Pearson Education, Inc., Upper Saddle River, N.J.

product being produced in those locations around the globe where the mix of factor costs and skills is most favorable (as predicted by the theory of comparative advantage). In sum, although Vernon's theory may be useful for explaining the pattern of international trade during the brief period of American global dominance, its relevance in the modern world seems more limited.

New Trade Theory

The new trade theory began to emerge in the 1970s when a number of economists pointed out that the ability of firms to attain economies of scale might have important implications for international trade.[30] **Economies of scale** are unit cost reductions associated with a large scale of output. Economies of scale have a number of sources, including the ability to spread fixed costs over a large volume, and the ability of large volume producers to utilize specialized employees and equipment that are more productive than less specialized employees and equipment. Economies of scale are a major source of cost reductions in many industries, from computer software to automobiles and from pharmaceuticals to aerospace. For example, Microsoft realizes economies of scale by spreading the fixed costs of developing new versions of its Windows operating system, which runs to about $5 billion, over the 250 million or so personal computers upon which each new system is ultimately installed. Similarly, automobile companies realize economies of scale by producing a high volume of automobiles from an assembly line where each employee has a specialized task.

New trade theory makes two important points: First, through its impact on economies of scale, trade can increase the variety of goods available to consumers and decrease the average costs of those goods. Second, in those industries when the output required to attain economies of scale represents a significant proportion of total world demand, the global market may only be able to support a small number of enterprises. Thus, world trade in certain products may be dominated by countries whose firms were first movers in their production.

INCREASING PRODUCT VARIETY AND REDUCING COSTS

Imagine first a world without trade. In industries where economies of scale are important, both the variety of goods that a country can produce and the scale of production are limited by the size of the market. If a national market is small, there may not be enough demand to enable producers to realize economies of scale for certain products. Accordingly, those products may not be produced, thereby limiting the variety of products available to consumers. Alternatively, they may be produced, but in such low volumes that unit costs and prices are considerably higher than they might be if economies of scale could be realized.

Now consider what happens when nations trade with each other. Individual national markets are combined into a larger world market. As the size of the market expands due to trade, individual firms may be able to better attain economies of scale. The implication, according to new trade theory, is that each nation may be able to specialize in producing a narrower range of products than it would in the absence of trade, yet by buying goods that it does not make from other countries, each nation can simultaneously *increase the variety* of goods available to its consumers and *lower the costs* of those goods. Thus trade offers an opportunity for mutual gain even when countries do not differ in their resource endowments or technology.

Suppose two countries each have an annual market for 1 million automobiles. By trading with each other, these countries can create a combined market for 2 million cars. In this combined market, due to the ability to better realize economies of scale, more varieties (models) of cars can be produced, and cars can be produced at a lower average cost, than in either market alone. For example, demand for a sports car may be limited to 55,000 units in each national market, while a total output of at least 100,000 per year may be required to realize significant scale economies. Similarly, demand for a minivan may be 80,000 units in each national market, and again a total output of at least 100,000 per year may be required to realize significant scale economies. Faced with limited domestic market demand, firms in each nation may decide not to produce a sports car,

since the costs of doing so at such low volume are too great. Although they may produce minivans, the cost of doing so will be higher, as will prices, than if significant economies of scale had been attained. Once the two countries decide to trade however, a firm in one nation may specialize in producing sports cars, while a firm in the other nation may produce minivans. The combined demand for 110,000 sports cars and 160,000 minivans allows each firm to realize scale economies. Consumers in this case benefit from having access to a product (sports cars) that was not available before international trade, and from the lower price for a product (minivans) that could not be produced at the most efficient scale before international trade. Trade is thus mutually beneficial because it allows for the specialization of production, the realization of scale economies, the production of a greater variety of products, and lower prices.

ECONOMIES OF SCALE, FIRST MOVER ADVANTAGES, AND THE PATTERN OF TRADE

A second theme in new trade theory is that the pattern of trade we observe in the world economy may be the result of economies of scale and first mover advantages. **First mover advantages** are the economic and strategic advantages that accrue to early entrants into an industry.[31] The ability to capture scale economies ahead of later entrants, and thus benefit from a lower cost structure, is an important first mover advantage. New trade theory argues that for those products where economies of scale are significant and represent a substantial proportion of world demand, the first movers in an industry can gain a scale-based cost advantage that later entrants find almost impossible to match. Thus, the pattern of trade that we observe for such products may reflect first mover advantages. Countries may dominate in the export of certain goods because economies of scale are important in their production, and because firms located in those countries were the first to capture scale economies, giving them a first mover advantage.

For example, consider the commercial aerospace industry. In aerospace there are substantial scale economies that come from the ability to spread the fixed costs of developing a new jet aircraft over a large number of sales. It is costing Airbus some $14 billion to develop its new super-jumbo jet, the 550-seat A380. To recoup those costs and break even, Airbus will have to sell at least 250 A380 planes. If Airbus can sell over 350 A380 planes, it will apparently be a profitable venture. However, total demand over the next 20 years for this class of aircraft is estimated to be somewhere between 400 and 600 units. Thus, the global market can probably only profitably support one producer of jet aircraft in the super-jumbo category. It follows that the European Union might come to dominate in the export of very large jet aircraft, primarily because a European based firm, Airbus, was the first to produce a 550-seat jet aircraft and realize scale economies. Other potential producers, such as Boeing, might be shut out of the market because they will lack the scale economies that Airbus will enjoy. By pioneering this market category, Airbus may have captured a *first mover advantage* based on *scale economies* that will be difficult for rivals to match and that will result in the European Union becoming the *leading exporter* of very large jet aircraft.

IMPLICATIONS OF NEW TRADE THEORY

New trade theory has important implications. The theory suggests that nations may benefit from trade even when they do not differ in resource endowments or technology. Trade allows a nation to specialize in the production of certain products, attaining scale economies and lowering the costs of producing those products, while buying products that it does not produce from other nations that specialize in the production of other products. By this mechanism, the variety of products available to consumers in each nation is increased, while the average costs of those products should fall, as should their price, freeing resources to produce other goods and services.

The theory also suggests that a country may predominate in the export of a good simply because it was lucky enough to have one or more firms among the first to produce that good. Because they are able to gain economies of scale, the first movers in an industry may get a lock on the world market that discourages subsequent entry. First movers' ability to benefit from increasing returns creates a barrier to entry. In the commercial aircraft industry, the fact that Boeing and Airbus are already in the industry and have the benefits of economies of scale discourages new entry and reinforces the dominance of America and Europe in the trade of midsized and large jet aircraft. This dominance is further reinforced because global demand may not be sufficient to profitably support another producer of midsized and large jet aircraft in the industry. So although Japanese firms might be able to compete in the market, they have decided not to enter the industry but to ally themselves as major subcontractors with primary producers (e.g., Mitsubishi Heavy Industries is a major subcontractor for Boeing on the 777 and 787 programs).

New trade theory is at variance with the Heckscher-Ohlin theory, which suggests that a country will predominate in the export of a product when it is particularly well endowed with those factors used intensively in its manufacture. New trade theorists argue that the United States is a major exporter of commercial jet aircraft not because it is better endowed with the factors of production required to manufacture aircraft, but because one of the first movers in the industry, Boeing, was a U.S. firm. The new trade theory is not at variance with the theory of comparative advantage. Economies of scale increase productivity. Thus, the new trade theory identifies an important source of comparative advantage.

This theory is quite useful in explaining trade patterns. Empirical studies seem to support the predictions of the theory that trade increases the specialization of production within an industry, increases the variety of products available to consumers, and results in lower average prices.[32] With regard to first-mover advantages and international trade, a study by Harvard business historian Alfred Chandler suggests that the existence of first-mover advantages is an important factor in explaining the dominance of firms from certain nations in specific industries.[33] The number of firms is very limited in many global industries, including the chemical industry, the heavy construction equipment industry, the heavy truck industry, the tire industry, the consumer electronics industry, the jet engine industry, and the computer software industry.

Perhaps the most contentious implication of the new trade theory is the argument that it generates for government intervention and strategic trade policy.[34] New trade theorists stress the role of luck, entrepreneurship, and innovation in giving a firm first mover advantages. According to this argument, the reason Boeing was the first mover in commercial jet aircraft manufacture—rather than firms like Great Britain's DeHavilland and Hawker Siddley, or Holland's Fokker, all of which could have been—was that Boeing was both lucky and innovative. One way Boeing was lucky is that DeHavilland shot itself in the foot when its Comet jet airliner, introduced two years earlier than Boeing's first jet airliner, the 707, was found to be full of serious technological flaws. Had DeHavilland not made some serious technological mistakes, Great Britain might have become the world's leading exporter of commercial jet aircraft. Boeing's innovativeness was demonstrated by its independent development of the technological know-how required to build a commercial jet airliner. Several new trade theorists have pointed out, however, that the U.S. government largely paid for Boeing's R&D; the 707 was a spin-off from a government-funded military program (the entry of Airbus into the industry was also supported by significant government subsidies). Herein is a rationale for government intervention: By the sophisticated and judicious use of subsidies, could a government increase the chances of its domestic firms becoming first movers in newly emerging industries, as the U.S. government apparently did with Boeing (and the European Union did with Airbus)? If this is possible, and the new trade theory suggests it might be, we have an economic rationale for a proactive trade policy that is at variance with the free trade prescriptions of the trade theories we have reviewed so far. We will consider the policy implications of this issue in Chapter 6.

National Competitive Advantage: Porter's Diamond

In 1990 Michael Porter of the Harvard Business School published the results of an intensive research effort that attempted to determine why some nations succeed and others fail in international competition.[35] Porter and his team looked at 100 industries in 10 nations. Like the work of the new trade theorists, Porter's work was driven by a belief that existing theories of international trade told only part of the story. For Porter, the essential task was to explain why a nation achieves international success in a particular industry. Why does Japan do so well in the automobile industry? Why does Switzerland excel in the production and export of precision instruments and pharmaceuticals? Why do Germany and the United States do so well in the chemical industry? These questions cannot be answered easily by the Heckscher-Ohlin theory, and the theory of comparative advantage offers only a partial explanation. The theory of comparative advantage would say that Switzerland excels in the production and export of precision instruments because it uses its resources very productively in these industries. Although this may be correct, this does not explain why Switzerland is more productive in this industry than Great Britain, Germany, or Spain. Porter tries to solve this puzzle.

Porter theorizes that four broad attributes of a nation shape the environment in which local firms compete, and these attributes promote or impede the creation of competitive advantage (see Figure 5.6). These attributes are

- *Factor endowments*—a nation's position in factors of production such as skilled labor or the infrastructure necessary to compete in a given industry.
- *Demand conditions*—the nature of home demand for the industry's product or service.
- *Relating and supporting industries*—the presence or absence of supplier industries and related industries that are internationally competitive.
- *Firm strategy, structure, and rivalry*—the conditions governing how companies are created, organized, and managed and the nature of domestic rivalry.

Porter speaks of these four attributes as constituting the *diamond*. He argues that firms are most likely to succeed in industries or industry segments where the diamond is most favorable. He also argues that the diamond is a mutually reinforcing system. The effect of one attribute is contingent on the state of others. For example, Porter argues that favorable demand conditions will not result in competitive advantage unless the state of rivalry is sufficient to cause firms to respond to them.

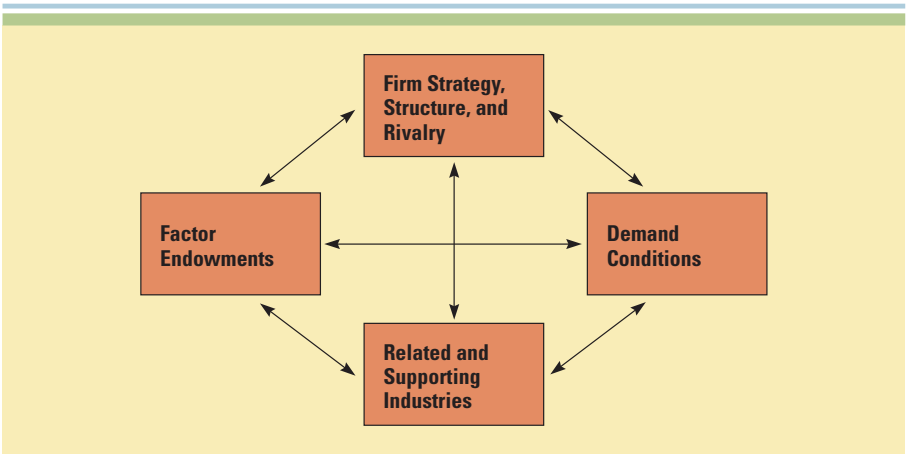


FIGURE 5.6

Determinants of National Competitive Advantage: Porter's Diamond

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Porter maintains that two additional variables can influence the national diamond in important ways: chance and government. Chance events, such as major innovations, can reshape industry structure and provide the opportunity for one nation's firms to supplant another's. Government, by its choice of policies, can detract from or improve national advantage. For example, regulation can alter home demand conditions, antitrust policies can influence the intensity of rivalry within an industry, and government investments in education can change factor endowments.

FACTOR ENDOWMENTS

Factor endowments lie at the center of the Heckscher-Ohlin theory. While Porter does not propose anything radically new, he does analyze the characteristics of factors of production. He recognizes hierarchies among factors, distinguishing between *basic factors* (e.g., natural resources, climate, location, and demographics) and *advanced factors* (e.g., communication infrastructure, sophisticated and skilled labor, research facilities, and technological know-how). He argues that advanced factors are the most significant for competitive advantage. Unlike the naturally endowed basic factors, advanced factors are a product of investment by individuals, companies, and governments. Thus, government investments in basic and higher education, by improving the general skill and knowledge level of the population and by stimulating advanced research at higher education institutions, can upgrade a nation's advanced factors.

The relationship between advanced and basic factors is complex. Basic factors can provide an initial advantage that is subsequently reinforced and extended by investment in advanced factors. Conversely, disadvantages in basic factors can create pressures to invest in advanced factors. An obvious example of this phenomenon is Japan, a country that lacks arable land and mineral deposits and yet through investment has built a substantial endowment of advanced factors. Porter notes that Japan's large pool of engineers (reflecting a much higher number of engineering graduates per capita than almost any other nation) has been vital to Japan's success in many manufacturing industries.

DEMAND CONDITIONS

Porter emphasizes the role home demand plays in upgrading competitive advantage. Firms are typically most sensitive to the needs of their closest customers. Thus, the characteristics of home demand are particularly important in shaping the attributes of domestically made products and in creating pressures for innovation and quality. Porter argues that a nation's firms gain competitive advantage if their domestic consumers are sophisticated and demanding. Such consumers pressure local firms to meet high standards of product quality and to produce innovative products. Porter notes that Japan's sophisticated and knowledgeable buyers of cameras helped stimulate the Japanese camera industry to improve product quality and to introduce innovative models. A similar example can be found in the wireless telephone equipment industry, where sophisticated and demanding local customers in Scandinavia helped push Nokia of Finland and Ericsson of Sweden to invest in cellular phone technology long before demand for cellular phones took off in other developed nations. The case of Nokia is reviewed in more depth in the accompanying Management Focus.

RELATED AND SUPPORTING INDUSTRIES

The third broad attribute of national advantage in an industry is the presence of suppliers or related industries that are internationally competitive. The benefits of investments in advanced factors of production by related and supporting industries can spill over into an industry, thereby helping it achieve a strong competitive position internationally. Swedish strength in fabricated steel products (e.g., ball bearings and cutting tools) has drawn on strengths in Sweden's specialty steel industry. Technological leadership in the

U.S. semiconductor industry provided the basis for U.S. success in personal computers and several other technically advanced electronic products. Similarly, Switzerland's success in pharmaceuticals is closely related to its previous international success in the technologically related dye industry.

One consequence of this process is that successful industries within a country tend to be grouped into clusters of related industries. This was one of the most pervasive findings of Porter's study. One such cluster Porter identified was in the German textile and apparel sector, which included high-quality cotton, wool, synthetic fibers, sewing machine needles, and a wide range of textile machinery. Such clusters are important because valuable knowledge can flow between the firms within a geographic cluster, benefiting all within that cluster. Knowledge flows occur when employees move between firms within a region and when national industry associations bring employees from different companies together for regular conferences or workshops.[36]

FIRM STRATEGY, STRUCTURE, AND RIVALRY

The fourth broad attribute of national competitive advantage in Porter's model is the strategy, structure, and rivalry of firms within a nation. Porter makes two important points here. First, different nations are characterized by different management ideologies, which either help them or do not help them to build national competitive advantage. For example, Porter noted the predominance of engineers in top management at German and Japanese firms. He attributed this to these firms' emphasis on improving manufacturing processes and product design. In contrast, Porter noted a predominance of people with finance backgrounds leading many U.S. firms. He linked this to U.S. firms' lack of attention to improving manufacturing processes and product design. He argued that the dominance of finance led to an overemphasis on maximizing short-term financial returns. According to Porter, one consequence of these different management ideologies was a relative loss of U.S. competitiveness in those engineering-based industries where manufacturing processes and product design issues are all-important (e.g., the automobile industry).

Porter's second point is that there is a strong association between vigorous domestic rivalry and the creation and persistence of competitive advantage in an industry. Vigorous domestic rivalry induces firms to look for ways to improve efficiency, which makes them better international competitors. Domestic rivalry creates pressures to innovate, to improve quality, to reduce costs, and to invest in upgrading advanced factors. All this helps to create world-class competitors. Porter cites the case of Japan:

> Nowhere is the role of domestic rivalry more evident than in Japan, where it is all-out warfare in which many companies fail to achieve profitability. With goals that stress market share, Japanese companies engage in a continuing struggle to outdo each other. Shares fluctuate markedly. The process is prominently covered in the business press. Elaborate rankings measure which companies are most popular with university graduates. The rate of new product and process development is breathtaking.[37]

A similar point about the stimulating effects of strong domestic competition can be made with regard to the rise of Nokia of Finland to global preeminence in the market for cellular telephone equipment. For details, see the Management Focus.

Evaluating Porter's Theory

Porter contends that the degree to which a nation is likely to achieve international success in a certain industry is a function of the combined impact of factor endowments, domestic demand conditions, related and supporting industries, and domestic rivalry. He argues that the presence of all four components is usually required for this diamond to boost competitive performance (although there are exceptions). Porter also contends that government can influence each of the four components of the diamond—either

MANAGEMENT FOCUS

The Rise of Finland's Nokia

The wireless phone market is one of the great growth stories of the last decade. Starting from a very low base in 1990, annual global sales of wireless phones surged to reach around 900 million units in 2006. By the end of 2006, the number of wireless subscribers worldwide was closing in on 2 billion, up from less than 10 million in 1990. Nokia is one of the dominant players in the world market for mobile phones. Nokia's roots are in Finland, not normally a country that comes to mind when one talks about leading-edge technology companies. In the 1980s, Nokia was a rambling Finnish conglomerate with activities that embraced tire manufacturing, paper production, consumer electronics, and telecommunications equipment. By 2006, it had transformed itself into a focused telecommunications equipment manufacturer with a global reach, sales of over $40 billion, earnings of more than $5 billion, and a 34 percent share of the global market for wireless phones. How has this former conglomerate emerged to take a global leadership position in wireless telecommunications equipment? Much of the answer lies in the history, geography, and political economy of Finland and its Nordic neighbors.

In 1981 the Nordic nations cooperated to create the world's first international wireless telephone network. They had good reason to become pioneers: it cost far too much to lay down a traditional wire line telephone service in those sparsely populated and inhospitably cold countries. The same features made telecommunications all the more valuable: people driving through the Arctic winter and owners of remote northern houses needed a telephone to summon help if things went wrong. As a result, Sweden, Norway, and Finland became the first nations in the world to take wireless telecommunications seriously. They found, for example, that although it cost up to $800 per subscriber to bring a traditional wire line service to remote locations, the same locations could be linked by wireless cellular for only $500 per person. As a consequence, 12 percent of people in Scandinavia owned cellular phones by 1994, compared with less than 6 percent in the United States, the world's second most developed market. This lead continued over the next decade. By the end of 2006, 90 percent of the population in Finland owned a wireless phone, compared with 70 percent in the United States.

Nokia, a long-time telecommunications equipment supplier, was well positioned to take advantage of this development from the start, but other forces were also at work that helped Nokia develop its competitive edge. Unlike virtually every other developed nation, Finland has never had a national telephone monopoly. Instead, the country's telephone services have long been provided by about 50 or so autonomous local telephone companies whose elected boards set prices by referendum (which naturally means low prices). This army of independent and cost-conscious telephone service providers prevented Nokia from taking anything for granted in its home country. With typical Finnish pragmatism, its customers were willing to buy from the lowest-cost supplier, whether that was Nokia, Ericsson, Motorola, or some other company. This situation contrasted sharply with that prevailing in most developed nations until the late 1980s and early 1990s, where domestic telephone monopolies typically purchased equipment from a dominant local supplier or made it themselves. Nokia responded to this competitive pressure by doing everything possible to drive down its manufacturing costs while staying at the leading edge of wireless technology.

The consequences of these forces are clear. Nokia is now a leader in digital wireless technology. Many now regard Finland as the lead market for wireless telephone services. If you want to see the future of wireless, you don't go to New York or San Francisco; you go to Helsinki, where Finns use their wireless handsets not just to talk to each other but also to browse the Web, execute e-commerce transactions, control household heating and lighting systems, or purchase Coke from a wireless-enabled vending machine. Nokia has gained this lead because Scandinavia started switching to digital technology five years before the rest of the world.[38]

positively or negatively. Factor endowments can be affected by subsidies, policies toward capital markets, policies toward education, and so on. Government can shape domestic demand through local product standards or with regulations that mandate or influence buyer needs. Government policy can influence supporting and related industries through regulation and influence firm rivalry through such devices as capital market regulation, tax policy, and antitrust laws.

If Porter is correct, we would expect his model to predict the pattern of international trade that we observe in the real world. Countries should be exporting products from those industries where all four components of the diamond are favorable, while importing in those areas where the components are not favorable. Is he correct? We simply do not know. Porter's theory has not been subjected to detailed empirical testing. Much about the theory rings true, but the same can be said for the new trade theory, the theory of comparative advantage, and the Heckscher-Ohlin theory. It may be that each of these theories, which complement each other, explains something about the pattern of international trade.

IMPLICATIONS FOR MANAGERS

Why does all this matter for business? The theories discussed in this chapter have at least three main implications for international businesses: location implications, first-mover implications, and policy implications.

LOCATION

Underlying most of the theories we have discussed is the notion that different countries have particular advantages in different productive activities. Thus, from a profit perspective, it makes sense for a firm to disperse its productive activities to those countries where, according to the theory of international trade, they can be performed most efficiently. If design can be performed most efficiently in France, that is where design facilities should be located; if the manufacture of basic components can be performed most efficiently in Singapore, that is where they should be manufactured; and if final assembly can be performed most efficiently in China, that is where final assembly should be performed. The result is a global web of productive activities, with different activities being performed in different locations around the globe depending on considerations of comparative advantage, factor endowments, and the like. If the firm does not do this, it may find itself at a competitive disadvantage relative to firms that do.

Consider the production of a laptop computer, a process with four major stages: (1) basic research and development of the product design, (2) manufacture of standard electronic components (e.g., memory chips), (3) manufacture of advanced components (e.g., flat-top color display screens and microprocessors), and (4) final assembly. Basic R&D requires a pool of highly skilled and educated workers with good backgrounds in microelectronics. The two countries with a comparative advantage in basic microelectronics R&D and design are Japan and the United States, so most producers of laptop computers locate their R&D facilities in one or both of these countries. (Apple, IBM, Motorola, Texas Instruments, Toshiba, and Sony all have major R&D facilities in both Japan and the United States.)

The manufacture of standard electronic components is a capital-intensive process requiring semiskilled labor, and cost pressures are intense. The best locations for such activities today are places such as Taiwan, Malaysia, and South Korea. These countries have pools of relatively skilled, moderate-cost labor. Thus, many producers of laptop computers manufacture standard components, such as memory chips, at these locations.

The manufacture of advanced components such as microprocessors is a capital-intensive process requiring skilled labor. Because cost pressures are not so intense at this stage,

these components can be—and are—manufactured in countries with high labor costs that also have pools of highly skilled labor (e.g., Japan and the United States).

Finally, assembly is a relatively labor-intensive process requiring only low-skilled labor, and cost pressures are intense. As a result, final assembly may be carried out in a country such as Mexico, which has an abundance of low-cost, low-skilled labor. A laptop computer produced by a U.S. manufacturer may be designed in California, have standard components produced in Taiwan and Singapore and advanced components produced in Japan and the United States, be assembled in Mexico, and be sold in the United States or elsewhere in the world. By dispersing production activities to different locations around the globe, the U.S. manufacturer is taking advantage of the differences between countries identified by the various theories of international trade.

FIRST-MOVER ADVANTAGES

According to the new trade theory, firms that establish a first-mover advantage with regard to the production of a particular new product may subsequently dominate global trade in that product. This is particularly true in industries where the global market can profitably support only a limited number of firms, such as the aerospace market, but early commitments also seem to be important in less concentrated industries such as the market for cellular telephone equipment (see the Management Focus on Nokia). For the individual firm, the clear message is that it pays to invest substantial financial resources in trying to build a first-mover, or early-mover, advantage, even if that means several years of losses before a new venture becomes profitable. The idea is to preempt the available demand, gain cost advantages related to volume, build an enduring brand ahead of later competitors, and, consequently, establish a long-term sustainable competitive advantage. Although the details of how to achieve this are beyond the scope of this book, many publications offer strategies for exploiting first-mover advantages and for avoiding the traps associated with pioneering a market (first-mover disadvantages).[39]

GOVERNMENT POLICY

The theories of international trade also matter to international businesses because firms are major players on the international trade scene. Business firms produce exports, and business firms import the products of other countries. Because of their pivotal role in international trade, businesses can exert a strong influence on government trade policy, lobbying to promote free trade or trade restrictions. The theories of international trade claim that promoting free trade is generally in the best interests of a country, although it may not always be in the best interest of an individual firm. Many firms recognize this and lobby for open markets.

For example, when the U.S. government announced its intention to place a tariff on Japanese imports of liquid crystal display (LCD) screens in the 1990s, IBM and Apple Computer protested strongly. Both IBM and Apple pointed out that (1) Japan was the lowest cost source of LCD screens, (2) they used these screens in their own laptop computers, and (3) the proposed tariff, by increasing the cost of LCD screens, would increase the cost of laptop computers produced by IBM and Apple, thus making them less competitive in the world market. In other words, the tariff, designed to protect U.S. firms, would be self-defeating. In response to these pressures, the U.S. government reversed its posture.

Unlike IBM and Apple, however, businesses do not always lobby for free trade. In the United States, for example, restrictions on imports of steel are the result of U.S. firms' direct pressure on the government. In some cases, the government has responded to pressure by getting foreign companies to agree to "voluntary" restrictions on their imports, using the implicit threat of more comprehensive formal trade barriers to get them to adhere to these agreements (historically, this has occurred in the automobile industry). In other cases, the government used what are called "antidumping" actions to justify tariffs on imports from other nations (these mechanisms will be discussed in detail in the next chapter).

As international trade theory predicts, many of these agreements have been self-defeating, such as the voluntary restriction on machine tool imports of 1985. Due to limited import competition from more efficient foreign suppliers, the prices of machine tools in the United States rose to higher levels than would have prevailed under free trade. Because machine tools are used throughout the manufacturing industry, the result was to increase the costs of U.S. manufacturing in general, creating a corresponding loss in world market competitiveness. Shielded from international competition by import barriers, the U.S. machine tool industry had no incentive to increase its efficiency. Consequently, it lost many of its export markets to more efficient foreign competitors. Because of this misguided action, the U.S. machine tool industry shrunk during the period when the agreement was in force. For anyone schooled in international trade theory, this was not surprising.[40] A similar scenario unfolded in the U.S. steel industry, where tariff barriers erected by the government in 2001 raised the cost of steel to important U.S. users, such as automobile companies and appliance makers, making their products less competitive.

Finally, Porter's theory of national competitive advantage also contains policy implications. Porter's theory suggests that it is in the best interest of business for a firm to invest in upgrading advanced factors of production; for example, to invest in better training for its employees and to increase its commitment to research and development. It is also in the best interests of business to lobby the government to adopt policies that have a favorable impact on each component of the national diamond. Thus, according to Porter, businesses should urge government to increase investment in education, infrastructure, and basic research (since all these enhance advanced factors) and to adopt policies that promote strong competition within domestic markets (since this makes firms stronger international competitors, according to Porter's findings).

CHAPTER SUMMARY

This chapter has reviewed a number of theories that explain why it is beneficial for a country to engage in international trade and has explained the pattern of international trade observed in the world economy. We have seen how the theories of Smith, Ricardo, and Heckscher-Ohlin all make strong cases for unrestricted free trade. In contrast, the mercantilist doctrine and, to a lesser extent, the new trade theory can be interpreted to support government intervention to promote exports through subsidies and to limit imports through tariffs and quotas. In explaining the pattern of international trade, the second objective of this chapter, we have seen that with the exception of mercantilism, which is silent on this issue, the different theories offer largely complementary explanations. Although no one theory may explain the apparent pattern of international trade, taken together, the theory of comparative advantage, the Heckscher-Ohlin theory, the product life-cycle theory, the new trade theory, and Porter's theory of national competitive advantage do suggest which factors are important. Comparative advantage tells us that productivity differences are important; Heckscher-Ohlin tells us that factor endowments matter; the product life-cycle theory tells us that where a new product is introduced is important; the new trade theory tells us that increasing returns to specialization and first-mover advantages matter; and Porter tells us that all these factors may be important insofar as they impact the four components of the national diamond. The chapter made these major points:

1. Mercantilists argued that it was in a country's best interests to run a balance-of-trade surplus. They viewed trade as a zero-sum game, in which one country's gains cause losses for other countries.
2. The theory of absolute advantage suggests that countries differ in their ability to produce goods efficiently. The theory suggests that a country should specialize in producing goods in areas where it has an absolute advantage and import goods in areas where other countries have absolute advantages.
3. The theory of comparative advantage suggests that it makes sense for a country to specialize in producing those goods that it can produce most efficiently, while buying goods that it can

produce relatively less efficiently from other countries—even if that means buying goods from other countries that it could produce more efficiently itself.

4. The theory of comparative advantage suggests that unrestricted free trade brings about increased world production; that is, that trade is a positive-sum game.
5. The theory of comparative advantage also suggests that opening a country to free trade stimulates economic growth, which creates dynamic gains from trade. The empirical evidence seems to be consistent with this claim.
6. The Heckscher-Ohlin theory argues that the pattern of international trade is determined by differences in factor endowments. It predicts that countries will export those goods that make intensive use of locally abundant factors and will import goods that make intensive use of factors that are locally scarce.
7. The product life-cycle theory suggests that trade patterns are influenced by where a new product is introduced. In an increasingly integrated global economy, the product life-cycle theory seems to be less predictive than it once was.
8. New trade theory states that trade allows a nation to specialize in the production of certain goods, attaining scale economies and lowering the costs of producing those goods, while buying goods that it does not produce from other nations that are similarly specialized. By this mechanism, the variety of goods available to consumers in each nation is increased, while the average costs of those goods should fall.
9. New trade theory also states that in those industries where substantial economies of scale imply that the world market will profitably support only a few firms, countries may predominate in the export of certain products simply because they had a firm that was a first mover in that industry.
10. Some new trade theorists have promoted the idea of strategic trade policy. The argument is that government, by the sophisticated and judicious use of subsidies, might be able to increase the chances of domestic firms becoming first movers in newly emerging industries.
11. Porter's theory of national competitive advantage suggests that the pattern of trade is influenced by four attributes of a nation: (*a*) factor endowments, (*b*) domestic demand conditions, (*c*) relating and supporting industries, and (*d*) firm strategy, structure, and rivalry.
12. Theories of international trade are important to an individual business firm primarily because they can help the firm decide where to locate its various production activities.
13. Firms involved in international trade can and do exert a strong influence on government policy toward trade. By lobbying government, business firms can promote free trade or trade restrictions.

Critical Thinking and Discussion Questions

1. Mercantilism is a bankrupt theory that has no place in the modern world. Discuss.
2. Is free trade fair? Discuss!
3. Unions in developed nations often oppose imports from low-wage countries and advocate trade barriers to protect jobs from what they often characterize as "unfair" import competition. Is such competition "unfair"? Do you think that this argument is in the best interests of (*a*) the unions, (*b*) the people they represent, and/or (*c*) the country as a whole?
4. What are the potential costs of adopting a free trade regime? Do you think governments should do anything to reduce these costs? What?
5. Reread the Country Focus feature, "Is China a Neo-mercantilist Nation?"
   a. Do you think China is pursuing an economic policy that can be characterized as neo-mercantilist?
   b. What should the United States, and other countries, do about this?
6. Reread the Country Focus feature on moving white collar jobs offshore.
   a. Who benefits from outsourcing skilled white color jobs to developing nations? Who are the losers?
   b. Will developing nations like the United States suffer from the loss of high-skilled and high-paying jobs to countries like India and China?
   c. Is there a difference between transferring high-paying white collar jobs, such as computer programming and accounting, and low-paying blue collar jobs to developing nations? If so, what is the difference, and should government do anything to stop the flow of white collar jobs out of the country to countries like India?

7. Drawing upon the new trade theory and Porter's theory of national competitive advantage, outline the case for government policies that would build national competitive advantage in biotechnology. What kinds of policies would you recommend the government adopt? Are these policies at variance with the basic free trade philosophy?
8. The world's poorest countries are at a competitive disadvantage in every sector of their economies. They have little to export. They have no capital; their land is of poor quality; they often have too many people given available work opportunities; and they are poorly educated. Free trade cannot possibly be in the interests of such nations! Discuss.

Research Task

Use the globalEDGE™ site to complete the following exercises:

1. The *WTO's International Trade Statistics* is an annual report that provides comprehensive, comparable, and updated statistics on trade in merchandise and commercial services. This report allows for an assessment of world trade flows by country, region, and main product or service categories. Using the most recent statistics available, identify the top five countries that lead in the export and import of merchandise, respectively.
2. Food is an integral part of understanding different countries, cultures, and lifestyles. In fact, your company is interested in importing Australian seafood to the United States. As part of the initial analysis, you want to identify the strengths of the Australian seafood industry. One resource you might find useful is the Australian Trade Commission Web site. Provide a short description of the current status of Australian seafood exports by variety, and also a list of the top countries importing Australian seafood.

CLOSING CASE

Trade in Information Technology and U.S. Economic Growth

Entrepreneurial enterprises in the United States invented most of the information technology that we use today, including computer and communications hardware, software, and services. In the 1960s and 1970s, companies like IBM and DEC, which developed first mainframe and then midrange computers, led the information technology sector. In the 1980s, the locus of growth in the sector shifted to personal computers and the innovations of companies like Intel, Apple, IBM, Dell, and Compaq, which helped develop the mass market for the product. Along the way, however, something happened to this uniquely American industry—it started to move the production of hardware offshore.

In the early 1980s production of "commodity components" for computers such as dynamic random access memory chips (DRAMs) migrated to low-cost producers in Japan, and then later to Taiwan and Korea. Soon hard disk drives, display screens, keyboards, computer mice, and a host of other components were outsourced to foreign manufacturers. By the early 2000s, American factories were specializing in making only the highest value components, such as the microprocessors made by Intel, and in final assembly (Dell, for example, assembles PCs at two North American facilities). Just about every other component was made overseas—because it cost less to do so. There was a lot of hand-wringing among politicians and journalists about the possible negative implication for the U.S. economy of this trend. According to the critics, high-paying manufacturing jobs in the information technology sector were being exported to foreign producers.

Was this trend bad for the U.S. economy, as the critics claimed? According to research, the globalization of production made information technology hardware about 20 percent less expensive than it would otherwise have been. The price declines supported additional investments in information technology by businesses and households. Because they were getting cheaper, computers diffused throughout the United States faster. In turn, the rapid diffusion of information technology translated into faster productivity growth as businesses used computers to streamline process. Between 1995 and 2002, productivity grew by 2.8 percent per annum in the

United States, well above the historic norm. According to calculations by academic researchers, some 0.3 percent per annum of this growth could be attributed directly to the reduced prices of information technology hardware made possible by the move to offshore production. In turn, the 0.3 percent per annum gain in productivity over 1995 to 2002 resulted in an additional $230 billion in accumulated gross domestic product in the United States. In short, some argue that the American economy grew at a faster rate precisely because production of information technology hardware was shifted to foreigners.

There is also evidence that the reduced price for hardware made possible by international trade created a boom in jobs in two related industries—computer software and services. During the 1990s the number of information technology jobs in the United States grew by 22 percent, twice the rate of job creation in the economy as a whole, and this at a time when manufacturing information technology jobs were moving offshore. The growth could partly be attributed to robust demand for computer software and services within the United States, and partly due to demand for software and services from foreigners, including those same foreigners who were now making much of the hardware. In sum, some argue that buying computer hardware from foreigners, as opposed to making it in the United States, had a significant *positive* impact upon the U.S. economy that outweighed any adverse effects from job losses in the manufacturing sector.[41]

Case Discussion Questions

1. During the 1990s and 2000s computer hardware companies in certain developed nations progressively moved the production of hardware components offshore, often outsourcing them to producers in developing nations. What does international trade theory suggest about the implications of this trend for economic growth in those developed nations?
2. Is the experience of the United States, as described in the case, consistent with the predictions of international trade theory?
3. What are the implications of the theory and data for (a) government policy in advanced nations such as the United States, and (b) the strategy of a firm in the computer industry, such as Dell or Apple Computer?

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Appendix: International Trade and the Balance of Payments

International trade involves the sale of goods and services to residents in other countries (exports) and the purchase of goods and services from residents in other countries (imports). A country's **balance-of-payments accounts** keep track of the payments to and receipts from other countries for a particular time period. These include payments to foreigners for imports of goods and service, and receipts from foreigners for goods and services exported to them. Table A1 provides a summary copy of the U.S. balance-of-payments accounts for 2006. Any transaction resulting in a payment to other countries is entered in the balance-of-payments accounts as a debit and given a negative (−) sign. Any transaction resulting in a receipt from other countries is entered as a credit and given a positive (+) sign. In this appendix we briefly describe the form of the balance-of-payments accounts, and we discuss whether a current account deficit, often a cause of much concern in the popular press, is something to worry about.

Balance-of-Payments Accounts

Balance-of-payments accounts are divided into three main sections: the current account, the capital account, and the financial account (to confuse matters, what is now called the *capital account* was until recently part of the current account, and the financial account used to be called the capital account). The **current account** records transactions that pertain to three categories, all of which can be seen in Table A1. The first category, *goods*, refers to the export or import of physical goods (e.g., agricultural foodstuffs, autos, computers, chemicals).

TABLE 5.A1

United States Balance-of-Payments Accounts, 2006 ($ millions)

Source: Bureau of Economic Analysis.

Current Account	$ Millions
Exports of Goods, Services, and Income Receipts	2,058,836
Goods	1,023,689
Services	413,127
Income receipts	622,020
Imports of Goods, Services, and Income Payments	−2,831,369
Goods	−1,859,655
Services	−342,428
Income payments	−629,286
Unilateral Current Transfers (net)	−84,122
Current Account Balance	−856,655
CAPITAL ACCOUNT	
Capital Account Transactions (net)	−3,914
FINANCIAL ACCOUNT	
U.S. Owned Assets Abroad, net	−1,045,760
U.S. official reserve assets	2,374
U.S. government assets	5,219
U.S. private assets	−1,053,353
Foreign Owned Assets in the United States	1,764,909
Foreign official assets in the United States	300,510
Other foreign assets in the United States	1,464,399
Statistical Discrepancy	141,419

The second category is the export or import of *services* (e.g., intangible products such as banking and insurance services). The third category, *income receipts and payments*, refers to income from foreign investments and payments that have to be made to foreigners investing in a country. For example, if a U.S. citizen owns a share of a Finnish company and receives a dividend payment of $5, that payment shows up on the U.S. current account as the receipt of $5 of investment income. Also included in the current account are unilateral current transfers, such as U.S. government grants to foreigners (including foreign aid), and private payments to foreigners (such as when a foreign worker in the United States sends money to his or her home country).

A **current account deficit** occurs when a country imports more goods, services, and income than it exports. A **current account surplus** occurs when a country exports more goods, services, and income than it imports. Table A1 shows that in 2006 the United States ran a current account deficit of −$856,655. This is often a headline grabbing figure that is widely reported in the news media. In recent years the U.S. current account deficit has been getting steadily larger, primarily due to the fact that America imports far more physical goods than it exports (you will notice that America actually runs a surplus on trade in services and is close to balanced on income payments).

Figure A1 shows how the U.S. current account position has changed in recent years. The 2006 current account deficit was the largest on record and was equivalent to around 6.5 percent of the country's GDP. Many people find this figure disturbing, the common assumption being that growing imports of goods displace domestic production, cause unemployment, and reduce the growth of the United States economy. For example, *The New York Times* responded to the record current account deficit in 2006 by stating that

> *A growing trade deficit acts as a drag on overall economic growth. Economists said that they expect that, in light of the new numbers, the government will have to revise its estimate of the nation's fourth quarter gross domestic product to show slightly slower expansion.*[42]

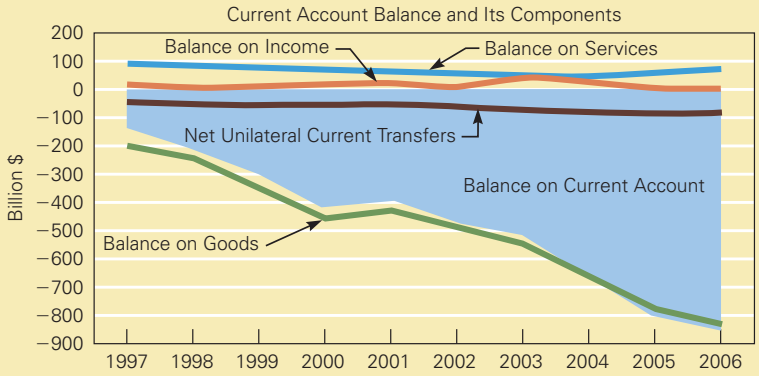
However, the issue is somewhat more complex than implied by statements like this. Fully understanding the implications of a large and persistent deficit requires that we look at the rest of the balance-of-payments accounts.

The **capital account** records one-time changes in the stock of assets. As noted above, until recently this item was included in the current account. The capital account

FIGURE 5.A1

Current Account Balance and Its Components

Source: U.S. Bureau of Economic Analysis (http://www.bea.gov/international/index.htm).



includes capital transfers, such as debt forgiveness and migrants transfers (the goods and financial assets that accompany migrants as they enter or leave the country). In the big scheme of things, this is a relatively small figure amounting to $3.914 billion in 2006.

The **financial account** (formerly the capital account) records transactions that involve the purchase or sale of assets. Thus, when a German firm purchases stock in a U.S. company or buys a U.S. bond, the transaction enters the U.S. balance of payments as a credit on the capital account. This is because capital is flowing into the country. When capital flows out of the United States, it enters the capital account as a debit.

The financial account is comprised of a number of elements. The net change in U.S.-owned assets abroad includes the change in assets owned by the U.S. government (U.S. official reserve assets and U.S. government assets) and the change in assets owned by private individuals and corporations. As can be seen from Table A1, in 2006 there was a −$1,045 billion reduction in U.S. assets owned abroad, primarily due to a $1,053 billion fall in the amount of foreign assets owned by U.S. corporations and individuals. In other words, private entities in the United States were net sellers of foreign assets in 2006, including foreign stocks, bonds, and real estate that they held.

Also included in the financial account are foreign-owned assets in the United States. These are divided into assets owned by foreign governments (foreign official assets) and assets owed by other foreign entities such as corporations and individuals (other foreign assets in the United States). As can be seen, in 2006 foreigners increased their holdings of U.S. assets, including treasury bills, corporate stocks and bonds, and direct investments in the United States, by $1,765 billion. Some $301 billion of this was due to an increase in the holding of U.S. assets by foreign governments, with the remainder being due to investments by private corporations and individuals in U.S. assets.

It is important at this point to understand that a basic principle of balance-of-payments accounting is double-entry bookkeeping. Every international transaction automatically enters the balance of payments twice—once as a credit and once as a debit. Imagine that you purchase a car produced in Japan by Toyota for $20,000. Since your purchase represents a payment to another country for goods, it will enter the balance of payments as a debit on the current account. Toyota now has the $20,000 and must do something with it. If Toyota deposits the money at a U.S. bank, Toyota has purchased a U.S. asset—a bank deposit worth $20,000—and the transaction will show up as a $20,000 credit on the financial account. Or Toyota might deposit the cash in a Japanese bank in return for Japanese yen. Now the Japanese bank must decide what to do with the $20,000. Any action that it takes will ultimately result in a credit for the U.S. balance of payments. For example, if the bank lends the $20,000 to a Japanese firm that uses it to import personal computers from the United States, then the $20,000 must be credited to the U.S. balance-of-payments current account. Or the Japanese bank might use the $20,000 to purchase U.S. government bonds, in which case it will show up as a credit on the U.S. balance-of-payments financial account.

Thus, any international transaction automatically gives rise to two offsetting entries in the balance of payments. Because of this, *the sum of the current account balance, the capital account, and the financial account balance should always add up to zero*. In practice, this does not always occur due to the existence of "statistical discrepancies," the source of which need not concern us here (note that in 2006 the statistical discrepancy amounted to $141 billion).

Does the Current Account Deficit Matter?

As discussed above, there is some concern when a country is running a deficit on the current account of their balance of payments.[43] In recent years a number of rich countries, including most notably the United States, have run persistent and growing current account deficits. When a country runs a current account deficit, the money that flows to other countries can then be used by those countries to purchase assets in the deficit country. Thus, when the United States runs a trade deficit with China, the Chinese use the money that they receive from U.S. consumers to purchase U.S. assets such as stocks, bonds, and the like. Put another way, a deficit on the current account is financed by selling assets to other countries; that is, by a surplus on the financial account. Thus, the persistent U.S. current account deficit is being financed by a steady sale of U.S. assets (stocks, bonds, real estate, and whole corporations) to other countries. In short, countries that run current account deficits become net debtors.

For example, as a result of financing its current account deficit through asset sales, the United States must deliver a stream of interest payments to foreign bondholders, rents to foreign landowners, and dividends to foreign stockholders. One might argue that such payments to foreigners drain resources from a country and limit the funds available for investment within the country. Since investment within a country is necessary to stimulate economic growth, a persistent current account deficit can choke off a country's future economic growth. This is the basis of the argument that persistent deficits are bad for an economy.

However, things are not this simple. For one thing, in an era of global capital markets money is efficiently directed toward its highest value uses—and over the last quarter of a century many of the highest value uses of capital have been in the United States. So even though capital is flowing out of the United States in the form of payments to foreigners, much of that capital finds its way right back into the country to fund productive investments in the United States. In short, it is not clear that the current account deficit chokes off U.S. economic growth. In fact, the U.S. economy has grown at an impressive rate over the last 25 years, despite running a persistent current account deficit, and despite financing that deficit by selling U.S. assets to foreigners. This is precisely because foreigners reinvest much of the income earned from U.S. assets, and from exports to the United States, right back into the United States. This revisionist view, which has gained in popularity in recent years, suggests that a persistent current account deficit might not be the drag on economic growth it was once thought to be.[44]

Having said this, there is still a nagging fear that at some point the appetite that foreigners have for U.S. assets might decline. If foreigners suddenly reduce their investments in the United States, what would happen? In short, instead of reinvesting the dollars they earn from exports and investment in the United States back into the country, they would sell those dollars for another currency, European euros or Japanese yen for example, and invest in euro- and yen-denominated assets instead. This would lead to a fall in the value of the dollar on foreign exchange markets, which in turn would increase the price of imports, and lower the price of U.S. exports, making them more competitive. This should reduce the overall level of the current account deficit. Thus in the long run the persistent U.S. current account deficit could be correct via a reduction in the value of the U.S. dollar. The concern is that such adjustments may not be smooth. Rather than a controlled decline in the value of the dollar, the dollar might suddenly lose a significant amount of its value in a very short time, precipitating a "dollar crisis."[45] Since the U.S. dollar is the world's major reserve currency, and it is held by many foreign governments and banks, any dollar crisis could deliver a body blow to the world economy and at the very least trigger a global economic slowdown. That would not be a good thing.