CHAPTER

9

INTERNATIONAL TRADE

On April 13, 1861, Southern troops fired on Fort Sumter in Charleston harbor, initiating the American Civil War. Less than a week later, on April 19, President Lincoln proclaimed a naval blockade of the South. Code-named the Anaconda Plan (after the snake that squeezes its prey to death), the blockade required the Union navy to patrol the Southern coastline, stopping and boarding ships that were attempting to land or depart. The object of the blockade was to prevent the Confederacy from shipping cotton to Europe, where it could be traded for military equipment, clothing, foodstuffs, and other supplies.

In the early years of the war, the North had too few ships to cover the 3,600-mile Southern coastline, so "running" the blockade was not difficult. But in the latter part of the war, the number of Union ships enforcing the blockade increased from about 90 to over 600, and sailing ships were replaced with faster, more lethal ironclad vessels. Still, private blockade-runners—like the fictitious Rhett Butler in Margaret Mitchell's novel *Gone with the Wind*—attempted to elude the Union navy in small, fast ships. Because the price of raw cotton in Great Britain was between 10 and 20 times what it was in the Confederacy (a differential that indicated disruption in the normal flow of trade), blockade-runners enjoyed huge profits when they were successful. But despite their efforts, by 1864 the Southern war effort was seriously hampered by a lack of military equipment and supplies, at least in part as a result of the blockade.

The use of a naval blockade as a weapon of war highlights a paradox in contemporary attitudes toward trade between nations. Presumably, an attempt by a foreign power to blockade U.S. ports would today be considered a hostile act that would elicit a strong response from the U.S. government. Yet one often hears politicians and others arguing that trade with other nations is harmful to the United States and should be restricted—in effect, that the United States should blockade its own ports! Despite support from President Clinton and virtually all professional economists, for example, many politicians opposed the 1993 signing

The Everett Collection

He appreciated the economic benefits of trade.

of the North American Free Trade Agreement (NAFTA), which was intended to increase U.S. trade with Mexico and Canada, on the grounds that it might cost American jobs. In December 1999, opponents of increased trade demonstrated in Seattle, disrupting meetings of the World Trade Organization, an international body set up to promote trade and enforce trade agreements. And in the years since, organized opposition to trade has grown further. So is trade a good thing or not? And if it is, why does it sometimes face determined and even violent opposition?

This chapter addresses international trade and its effects on the broader economy. We will begin by reviewing the idea of *comparative advantage*, which was introduced in Chapter 2. We will show that everyone can enjoy more goods and services if nations specialize in those products in which they have a comparative advantage, and then trade freely among themselves. Furthermore, if trade is unrestricted, market forces will ensure that countries produce those goods in which they have a comparative advantage.

Having shown the potential benefits of trade, we will turn next to the reasons for opposition to trade. Although opening the economy to trade increases economic welfare overall, some groups—such as workers used intensively in industries that face competition from foreign producers—may be made worse off. The fact that open trade may hurt some groups creates political pressure to enact measures restricting trade, such as taxes on imported goods (called *tariffs*) and limits on imports (called *quotas*). We will analyze the effects of these trade restrictions, along with other ways of responding to concerns about affected industries and workers. From an economic point of view, providing direct assistance to those who are hurt by increased trade is preferable to blocking or restricting trade.

Climate, soil, and long experience give France a comparative advantage in producing fine wines.

COMPARATIVE ADVANTAGE AS A BASIS FOR TRADE

Chapter 2 began with the story of the Nepalese cook Birkhaman, a remarkable jack-of-all-trades who could do everything, from butchering a goat to fixing an alarm clock. Yet despite his range of skills, Birkhaman, like most Nepalese, was quite poor. The reason for Birkhaman's poverty, as we saw in Chapter 2, was precisely his versatility. Because he did so many different things, he could not hope to become as productive in each separate activity as someone who specialized entirely in that activity.

The alternative to a nation of Birkhamans is a country in which each person specializes in the activity at which he is relatively best, or has a *comparative advantage*. This specialization, combined with trade between producers of different goods and services, allows a society to achieve a higher level of productivity and standard of living than one in which each person is essentially self-sufficient.

This insight, that specialization and trade among individuals can yield impressive gains in productivity, applies equally well to nations. Factors such as climate, natural resources, technology, workers' skills and education, and culture provide countries with comparative advantages in the production of different goods and services. For example, as we saw in Chapter 2, the large number of leading research universities in the United States gives that nation a comparative advantage in the design of technologically sophisticated computer hardware and software. Likewise, the wide international use of the English language endows the United States with a comparative advantage in producing popular films and TV shows. Similarly, France's climate and topography, together with the accumulated knowledge of generations of vintners, provides that country a comparative advantage in producing fine wines, while Australia's huge expanses of arable land give that country a comparative advantage in producing grain.

The *principle of comparative advantage* tells us that we can all enjoy more goods and services when each country produces according to its comparative advantage, and then trades with other countries. In the next section we explore this fundamental idea in greater detail.

PRODUCTION AND CONSUMPTION POSSIBILITIES AND THE BENEFITS OF TRADE

In this section we will consider how international trade benefits an individual country. To do so, we will contrast the production and consumption opportunities in a **closed economy**—one that does not trade with the rest of the world—with the opportunities in an **open economy**—one that does trade with other economies.

closed economy an economy that does not trade with the rest of the world

open economy an economy that trades with other countries

Recall from Chapter 2 that the production possibilities curve (PPC) for a two-good economy is a graph that shows the maximum amount of one good that can be produced for every possible level of production of the other good. For purposes of illustration, we consider an economy that produces only two goods, coffee and computers. In such an economy, the point *C* on the PPC shown in Figure 9.1 tells us that the maximum production of coffee is 100,000 pounds per year when the economy is producing 1,000 computers per year.

Recall also from Chapter 2 that the smoothly bowed shape of the PPC in Figure 9.1 is typical for an economy that employs a large number of workers. The slope of the PPC at each point reflects the opportunity cost of producing an additional computer. For instance, the opportunity cost, in terms of coffee, of producing an extra computer at point *C* is given by the slope of the line tangent to the PPC at that point. Because computers will be produced first by workers with the greatest comparative advantage (the lowest opportunity cost), the slope of the PPC becomes more and more sharply negative as we move from left to right along the curve. Thus, at Point *D*, where the economy is producing 40,000 pounds per year of coffee and 2,000 computers per year, the slope of the PPC is steeper than at *C*. This means that the opportunity cost of an additional computer (the number of pounds of coffee that must be forgone to produce an additional computer) is greater at *D* than at *C*.

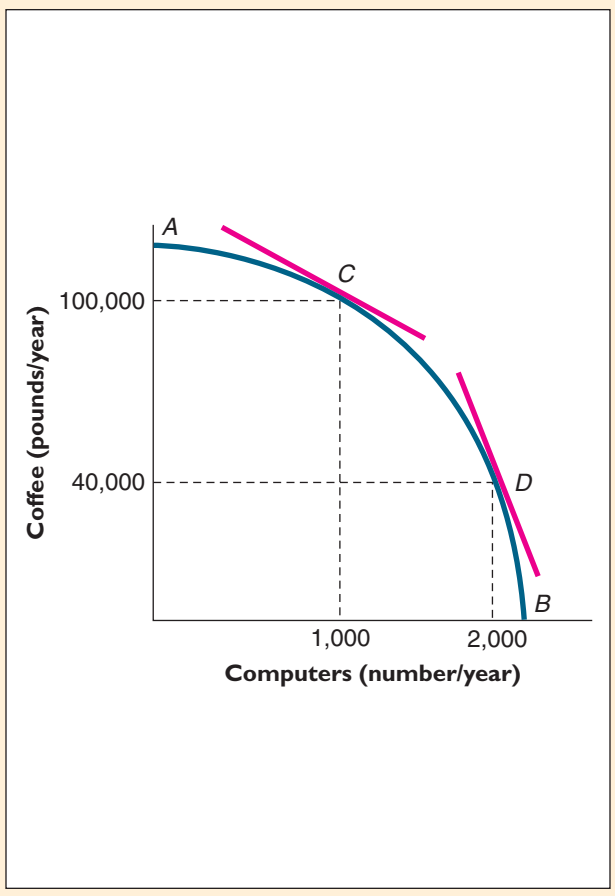

FIGURE 9.1
Production Possibilities Curve for a Many-Worker Economy.
The PPC for many-worker economy has a smooth, outwardly bowed shape. At each point on the PPC, the slope of the curve reflects the opportunity cost, in terms of coffee forgone, of producing an additional computer. For example, the opportunity cost of a computer at point *C* equals the slope of the line tangent to the PPC at that point, and the opportunity cost of a computer at point *D* equals the slope of the line tangent to the PPC there. Because the opportunity cost of producing another computer increases as more computers are produced, the slope of the PPC becomes more and more negative as we read from left to right on the graph.

RECAP | **PRODUCTION POSSIBILITIES CURVES (PPCs)**

- The *production possibilities curve* (PPC) for a two-good economy is a graph that shows the maximum amount of one good that can be produced at each possible level of production of the other good.
- The slope of a PPC at any point indicates the opportunity cost, in terms of forgone production of the good on the vertical axis, of increasing production of the good on the horizontal axis by one unit.
- The more of a good that is already being produced, the greater the opportunity cost of increasing production still further. Thus the slope of the PPC becomes more and more negative as we move from left to right, imparting the characteristic outwardly bowed shape of the curve.

CONSUMPTION POSSIBILITIES WITH AND WITHOUT INTERNATIONAL TRADE

A country's production possibilities curve shows the quantities of different goods that its economy can produce. However, economic welfare depends most directly not on what a country can *produce,* but on what its citizens can *consume*. The combinations of goods and services that a country's citizens might feasibly consume are called the country's **consumption possibilities.**

consumption possibilities the combinations of goods and services that a country's citizens might feasibly consume

The relationship between a country's consumption possibilities and its production possibilities depends on whether or not the country is open to international trade. In a closed economy with no trade, people can consume only the goods and services produced within their own country. *In a closed economy, then, society's consumption possibilities are identical to its production possibilities.* A situation in which a country does not trade with other nations, producing everything its citizens consume, is called **autarky.**

autarky a situation in which a country does not trade with other nations

The case of an open economy, which trades with the rest of the world, is quite different. In an open economy, people are not restricted to consuming what is produced in their own country, because part of what they produce can be sent abroad in exchange for other goods and services. Indeed, we will see in this section that opening an economy up to trade may allow citizens to consume more of everything. Thus, *in an open economy, a society's consumption possibilities are typically greater than (and will never be less than) its production possibilities*.

In the examples that follow, our focus will be on Costa Rica, which for simplicity is assumed to produce and consume only two goods, coffee and computers. Consider the PPC shown as curve *ACDB* in Figure 9.2. Point *A,* where the PPC intercepts the vertical axis, indicates the maximum amount of coffee that Costa Rica can produce, and point *B,* the horizontal intercept of the PPC, shows the maximum number of computers it can produce. As before, the intermediate points on the PPC represent alternative combinations of coffee and computers that can be produced.

Now suppose that the Costa Rican economy, which was operating at point *D* as a closed economy (meaning that it both produced and consumed 2,000 computers per year and 50,000 pounds per year of coffee), gains the opportunity to buy or sell either good in the world market at prices of $10 per pound for coffee and $500 per computer. Without changing its production at all, we see that it immediately enjoys a new range of consumption possibilities. For example, if it sold its entire production of 2,000 computers in the world market at $500 apiece, the $1,000,000 it would earn would enable it to purchase an additional 100,000 pounds of coffee each year. Thus, the point *E* in Figure 9.2, which was not available to Costa Ricans in the absence of international trade, is now attainable.

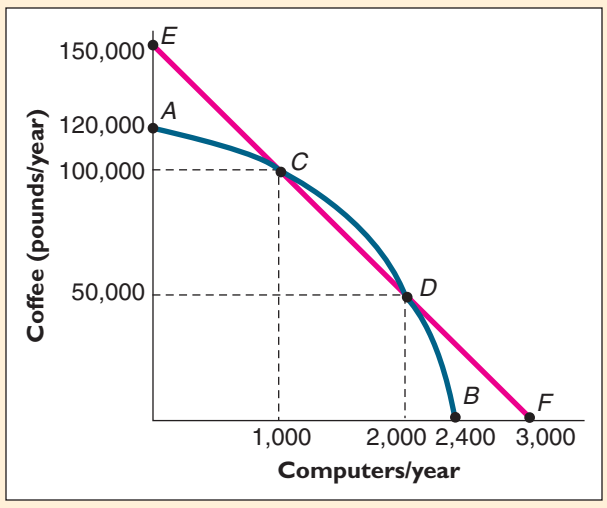

FIGURE 9.2
Buying and Selling in World Markets.
If Costa Rica produces at point *C* and can buy or sell computers and coffee in world markets at prices of $500 per computer and $10 per pound, respectively, it can consume any point along the line *EF*.

Alternatively, suppose that Costa Ricans again start at *D* and now sell their annual production of 50,000 pounds of coffee in the world market. The $500,000 they receive from this sale will enable them to buy an additional 1,000 computers each year. Thus, the point *F* in Figure 9.2, which was also not a consumption option in the absence of international trade, now becomes available. And as you can easily verify, any other point along the line *EF* also becomes available to Costa Ricans if they produce at *D* and can exchange their goods in world markets at the stated prices.

EXERCISE 9.1

Suppose prices in world markets are again $500 per computer and $10 per pound for coffee. Show that if Costa Rica starts by producing at point *C* in Figure 9.2, it can consume 500 computers per year and 125,000 pounds per year of coffee. To do so, how many units of each good will it buy or sell in world markets?

EXERCISE 9.2

If prices remain as before and if Costa Rica again starts by producing at point *C* in Figure 9.2 and can trade in world markets, it can consume 2,500 computers per year and 25,000 pounds per year of coffee. To do so, how many units of each good will it buy or sell in world markets?

If Costa Rica could buy or sell in world markets at $500 per computer and $10 per pound for coffee, would its best option be to produce at point *C* in Figure 9.2? No, because it could do better by producing at point *G* in Figure 9.3.

If Costa Rica produces at point *G* in Figure 9.3 and can buy or sell computers and coffee in world markets at prices of $500 per computer and $10 per pound, the country's consumption possibilities will now lie along the line *LM*. This line has two key features. First, it is drawn so that it is tangent to the PPC at point *G* in Figure 9.3. Second, the slope of line *LM* is determined by the relative prices of coffee and computers on the world market. Specifically, the slope of line *LM,* which is

(160,000 pounds of coffee/year)/(3,200 computers/year)
= 50 pounds of coffee per computer

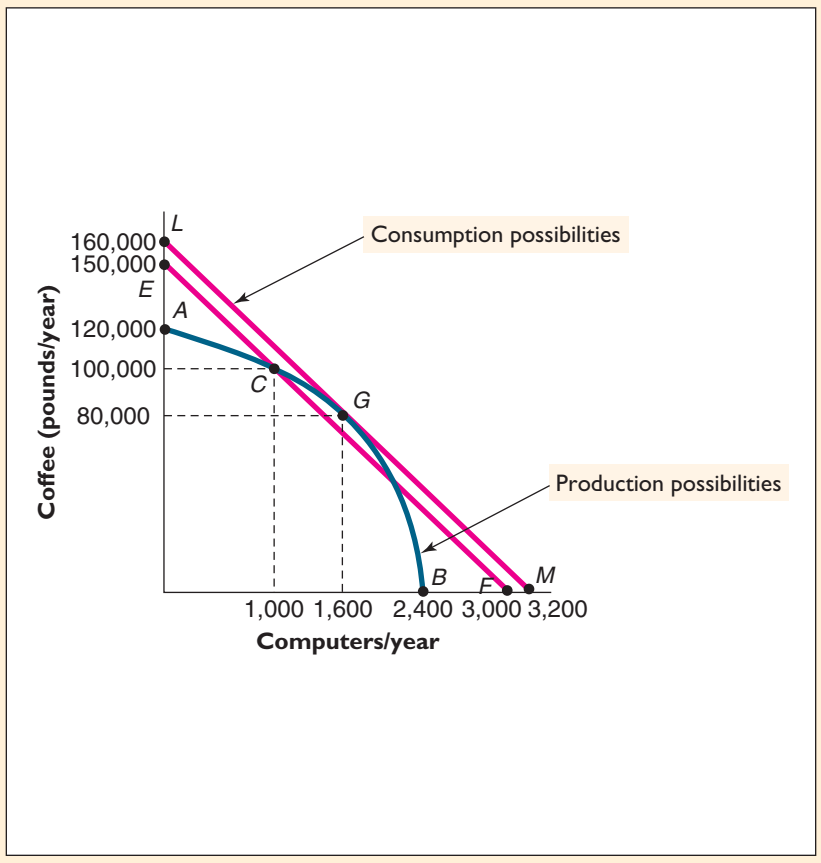

FIGURE 9.3
Production Possibilities, Consumption Possibilities, and the Optimal Production Mix for an Open Economy. If Costa Rica can buy or sell computers and coffee in world markets at prices of $500 per computer and $10 per pound, the line *LM* maximizes the country's consumption possibilities. The slope of this line is the rate at which coffee can be traded for computers at the stated world prices—namely, 50 pounds of coffee per computer. The line *LM* is tangent to the production possibilities curve at *G*. Costa Rica's best option is to produce at point *G* and then trade in world markets (either sell computers and buy coffee or vice versa) so as to reach its most desired point on the line *LM*.

tells us how much coffee must be exchanged on world markets to obtain an additional computer.

With access to international trade, Costa Rica can consume the greatest amount of both coffee and computers by producing at point *G* on the PPC and

"The repairs will take awhile. We need a part from Mexico, a part from Brazil and one from Taiwan."

trading on the international market to obtain the desired combination of coffee and computers on line *LM*. (The exact combination of coffee and computers Costa Ricans will choose depends on the preferences of its population.)

Why should the Costa Ricans produce at point *G*? At point *G*, and only at that point, the slope of the PPC equals the slope of the consumption possibilities line, *LM*. Hence, only at point *G* is the opportunity cost of increasing domestic computer production equal to the opportunity cost of purchasing an extra computer on the world market. If the opportunity cost of producing a computer domestically exceeded the opportunity cost of purchasing a computer on the world market, Costa Rica would gain by reducing its computer production and importing more computers. Likewise, if the opportunity cost of producing a computer domestically were less than the opportunity cost of purchasing a computer abroad, Costa Rica would gain by increasing computer production and reducing computer imports. Costa Rica's best production combination, therefore, is at point *G*, where the domestic and international opportunity costs of acquiring an extra computer, measured in terms of coffee forgone, are equal. The combination of goods at point *G* is also the one whose sale at world prices produces the largest possible total revenue.

We have already stated the general conclusion that can be drawn from this analysis. Once again, by opening itself up to trade, a country can consume more of *every* good than if it relied solely on its own production (a situation of *autarky*). Graphically, the consumption possibilities line in Figure 9.3 lies above the production possibilities curve, showing that through trade, Costa Rica can consume combinations of computers and coffee that would not be attainable if its economy were closed to trade.[1]

As we saw in Chapter 2, production possibilities curves do not always bow outward like the one shown in Figures 9.1 through 9.3. In the following example, we consider the case of a two-good economy in which the opportunity cost of producing each good is independent of the amount of it produced.

EXAMPLE 9.1

How do world prices affect what a country produces?

The 100 workers in Islandia, a small island open economy, are equally productive in producing coffee and tea. In a day's work, each can produce either eight pounds of coffee or eight pounds of tea. Workers who divide their time between the two activities will produce each good in proportion to the amount of time spent producing it. Describe Islandia's consumption possibilities curve if the world price of coffee is twice that of tea. What if the world price of coffee is half that of tea? What will Islandia produce if the world price of coffee happens to equal the world price of tea?

Islandia's production possibilities curve is shown in Figure 9.4. At one extreme, if everyone works full time producing coffee, it can produce 800 pounds of coffee per day and no tea (point *A*). At the other extreme, if everyone works full time producing tea, it can produce 800 pounds of tea per day and no coffee (point *D*). Any other point on the straight line joining *A* and *D* is also feasible. For example, Islandians could produce 600 pounds of coffee per day and 200 pounds of tea (point *B*), or 200 pounds of coffee per day and 600 pounds of tea (point *C*).

Given that Islandia can trade with other nations, the country's goal should be to produce the combination of tea and coffee that will sell for the largest possible amount at world prices. If the world price of coffee is twice that of tea, Islandia's best bet would thus be to produce only coffee—that is, to produce at point *A* in Figure 9.4. Its consumption possibilities curve would then be the curve labeled *AD′* in

[1]The single point at which consumption possibilities do *not* lie above production possibilities in Figure 9.3 is at point *G*, where production possibilities and consumption possibilities are the same. If Costa Rican residents happen to prefer the combination of computers and coffee at point *G* to any other point on *LM*, then they realize no benefit from trade.

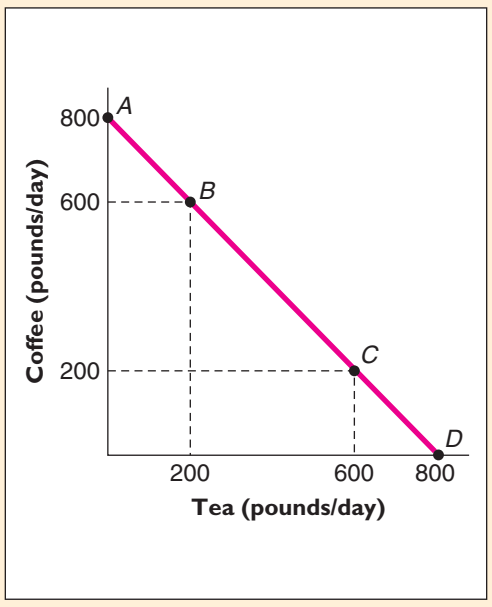

FIGURE 9.4
A Straight-Line Production Possibilities Curve.
When this economy devotes all of its labor to coffee production, it can produce 800 pounds per day of coffee (point *A*). When it devotes all of its labor to tea production, it also can produce 800 pounds per day of tea (point *D*). When it divides its labor between the two activities (e.g., as at points *B* and *C*), the output of each good is proportional to the amount of labor devoted to its production.

Figure 9.5(a). Since the price of coffee is twice the price of tea, the money earned by selling 800 pounds of coffee would be enough to buy as much as 1,600 pounds of tea (point *D′*). With the money earned by selling the coffee it produces at point *A* in world markets, the country could then consume any combination of coffee and tea along the line *AD′*.

Conversely, if the world price of tea is twice the world price of coffee, Islandians do best by specializing completely in tea production, as at point *D* in Figure 9.5(b). By selling the 800 pounds of tea produced at point *D*, they could buy as many

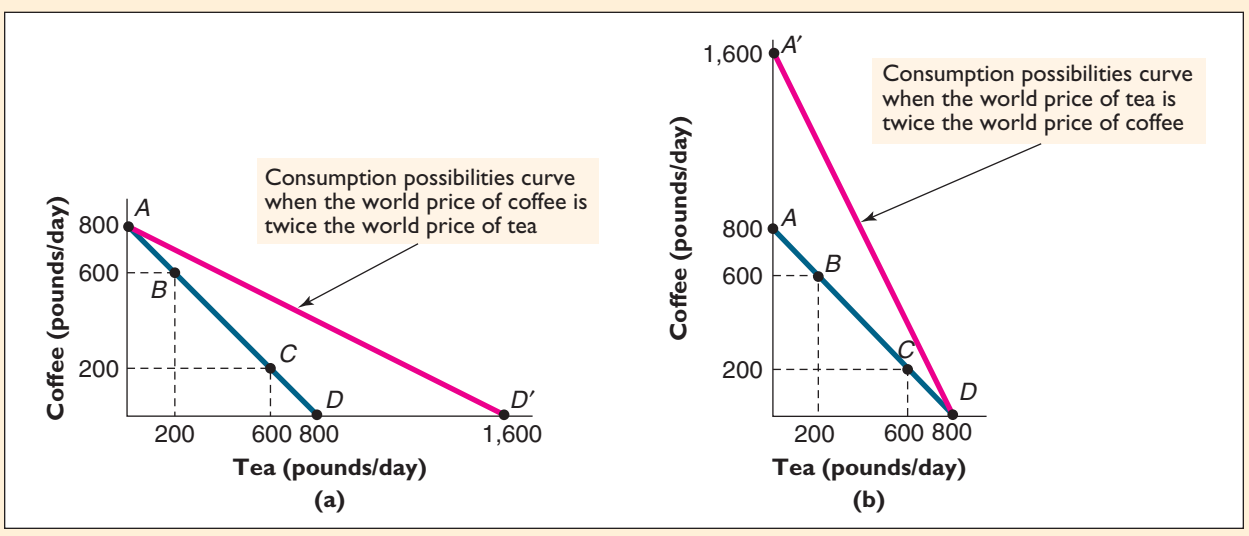

FIGURE 9.5
Two Consumption Possibilities Curves.
When the world price of coffee is twice the world price of tea, the country should specialize in coffee production at point *A* in panel (a). When the world price of coffee is half the world price of tea, the country should specialize in tea production (b).

as 1,600 pounds of coffee, or point A' in Figure 9.5(b). With the money earned by selling the tea it produces at point D in world markets, the country could then consume any combination of coffee and tea along the line $A'D$.

Finally, if the world price of coffee were the same as the world price of tea, it would not matter which point Islandians chose on their production possibilities curve, because every bundle along the PPC would sell for the same amount. In this case, Islandia's PPC would be identical to its consumption possibilities curve. It would gain nothing from being able to participate in world markets.

EXERCISE 9.3

How would your answer to the questions posed in Example 9.1 differ if a new variety of coffee plant made each Islandian worker able to produce three times as much coffee as before?

As Example 9.1 and Exercise 9.3 illustrate, the case of a straight-line production possibilities curve is different from the case of a bow-shaped production possibilities curve. In the latter case, a country typically maximizes its consumption possibilities by producing at the point where the consumption possibilities line is tangent to the PPC, and then trading so as to reach its most preferred point on the consumption possibilities line. In contrast, completely specialized production is the standard outcome in the case of a straight-line production possibilities curve. In that case, a country typically maximizes its consumption possibilities by devoting all its resources to production of the good for which the output per unit of resource input sells for the highest price.

RECAP **CONSUMPTION POSSIBILITIES AND PRODUCTION POSSIBILITIES**

- A country's *consumption possibilities* are the combinations of goods and services that its citizens might feasibly consume.
- In an economy that is closed to trade, residents can consume only what is produced domestically (a situation of *autarky*). Hence, in a closed economy, consumption possibilities equal production possibilities.
- The residents of an open economy can trade part of what they produce on international markets. According to the principle of comparative advantage, trade allows everyone to do better than they could otherwise. Thus, in an open economy, consumption possibilities are typically greater than, and will never be less than, production possibilities.
- Graphically, consumption possibilities in an open economy are described by a downward-sloping straight line whose slope equals the amount of the good on the vertical axis that must be traded on the international market to obtain one unit of the good on the horizontal axis. In the case of a bow-shaped production possibilities curve, a country maximizes its consumption possibilities by producing at the point where the consumption possibilities line is tangent to the PPC, and then trading so as to reach its most preferred point on the consumption possibilities line. In the case of a straight-line PPC, a country typically maximizes its consumption possibilities by specializing in the good for which an hour's production sells for the largest dollar amount in world markets.

ECONOMIC NATURALIST 9.1

Does "cheap" foreign labor pose a danger to high-wage economies?

Some people argue that high-wage industrialized countries lose by trading with low-wage developing nations. The concern is that the lower average wage that prevails in developing nations will allow those countries to produce most or all goods and services at lower cost. Unable to compete, the industrialized countries will suffer declining wages and rising unemployment. Does "cheap" foreign labor pose a danger to high-wage economies?

The "cheap foreign labor" argument is fallacious because it ignores the principle of comparative advantage and the advantages of specialization. To illustrate the key issues, suppose the United States produces both software and beef. Trade negotiators have proposed to open trade between the United States and a developing nation, Fredonia, which produces the same two products. Real wages are much lower in Fredonia than in the United States. Does this fact imply that Fredonia will undersell the United States in both the software and the beef markets, threatening American workers with the loss of their jobs?

To answer this question, let's first ask *why* wages are lower in Fredonia. As suggested in Chapter 2 as well as the chapter on perfectly competitive apply, wages are determined by the productivity of labor. Hence, if wages in Fredonia are radically lower than in the United States, Fredonian workers must be much less productive than U.S. workers. This observation is enough to show why Fredonian producers will not be able to undersell American producers in both industries. Even though Fredonian firms pay lower wages, because of differences in factors such as technology, physical capital, and human capital, a Fredonian worker produces much less output per hour than an American worker. Thus, lower Fredonian wages do not necessarily translate into lower production costs.

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Does cheap foreign labor pose a danger to high-wage economies?

Indeed, Fredonia's production costs will tend to be lower than U.S. production costs only in those industries in which Fredonia is *relatively* more productive. Recall the principle of comparative advantage. Suppose that Fredonia is half as productive as the United States in producing beef, but only one-tenth as productive in producing software. In that case, the United States has an absolute advantage in producing both goods, but Fredonia has a comparative advantage in producing beef and the United States has a comparative advantage in producing software. The United States can gain by producing more software and trading the extra software to Fredonians for beef. Fredonia can gain too by trading its beef for software. Far from being hurt by trading with Fredonia, U.S. consumers can have more of both goods through trade.

While the U.S. economy as a whole gains from trade with Fredonia, the United States will have a larger software sector and a smaller beef-producing sector than it would in the absence of trade. That is, some U.S. software will be exported to Fredonia, but some U.S.-produced beef will be replaced by imported Fredonian beef. Hence, although opportunities for workers in the software sector will increase as a result of trade, employment and wages in the beef sector will fall. We will discuss the sectoral impacts of trade in the next section.

A SUPPLY-AND-DEMAND PERSPECTIVE ON TRADE

To this point we have shown that a country can improve its overall consumption possibilities by trading with other countries. In this section we will look more carefully at how international trade affects supply and demand in the markets for

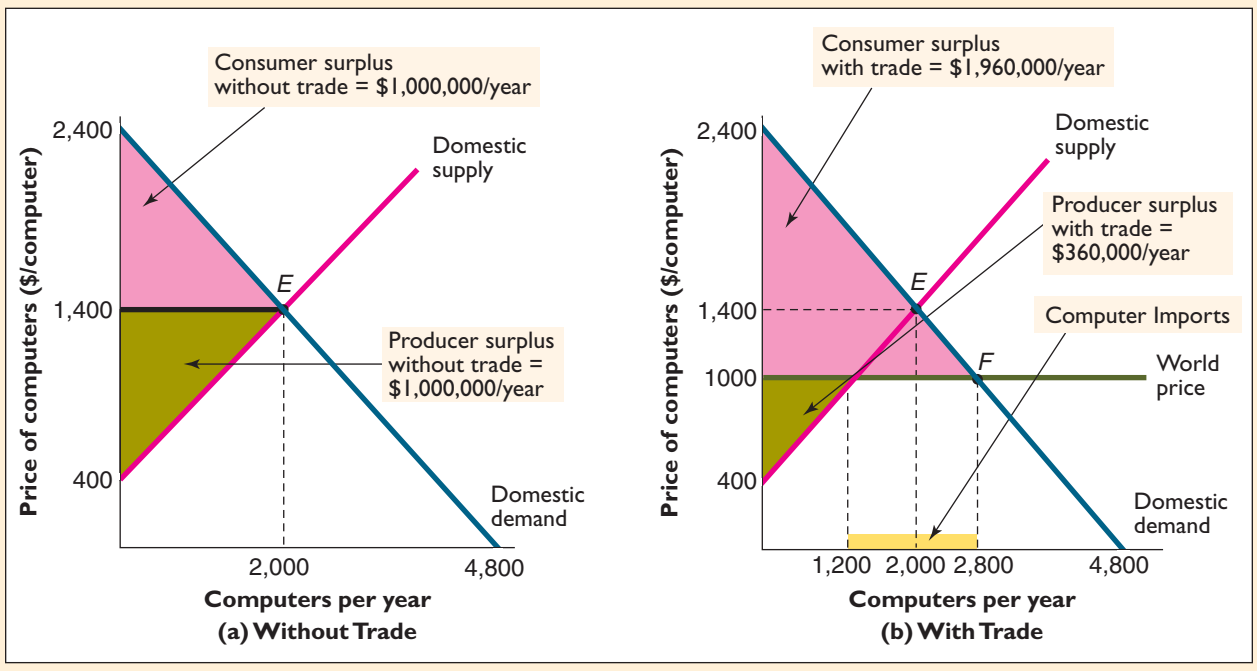


FIGURE 9.6

The Market for Computers in Costa Rica.

If Costa Rica is closed to international trade (a), the equilibrium price and quantity of computers are determined by the intersection of the domestic supply and demand curves at E. But if Costa Rica is open to trade (b), the domestic price of computers must equal the world price of $1,000. At that price, Costa Ricans will demand 2,800 computers each year, but domestic producers will supply only 1,200. Thus, 2,800 − 1,200 = 1,600 computers must be imported each year from abroad. Compared to the closed-economy outcome, computer buyers gain $960,000 per year of additional consumer surplus with trade, and domestic computer sellers lose $640,000 per year of producer surplus. For Costa Rican computer buyers and sellers as a whole, total economic surplus is thus $320,000 per year larger with trade.

specific goods. We will see that when it is costly for workers and firms to change industries, opening up trade with other countries may create groups of winners and losers among producers, even as it helps consumers.

Let's see how trade affects the markets for computers and coffee in Costa Rica. Figure 9.6 shows the supply and demand for computers in that country. As usual, the price is shown on the vertical axis and the quantity on the horizontal axis. We assume that computers sell in the world market for a price of $1,000 each. The upward-sloping curve in Figure 9.6 is the supply curve of computers, in this case for computers produced in Costa Rica; and the downward-sloping curve is the demand curve for computers by Costa Rican residents.

If the Costa Rican economy is closed to international trade, then market equilibrium occurs where the domestic supply and demand curves intersect, at point *E* in Figure 9.6(a). The equilibrium price will be $1,400 per computer and the equilibrium quantity, 2,000 computers per year. Domestic computer buyers enjoy a consumer surplus of $1 million per year, and domestic computer producers enjoy a producer surplus of $1 million per year.

If Costa Rica opens its market to trade, however, the relevant price for computers becomes the **world price** of computers, the price at which computers are traded internationally. The world price for computers is determined by the worldwide supply and demand for computers. If we assume that Costa Rica's computer market is too small to affect the world price for computers very much, the world price can be treated as fixed, and represented by a horizontal line in the figure.

world price the price at which a good or service is traded on international markets

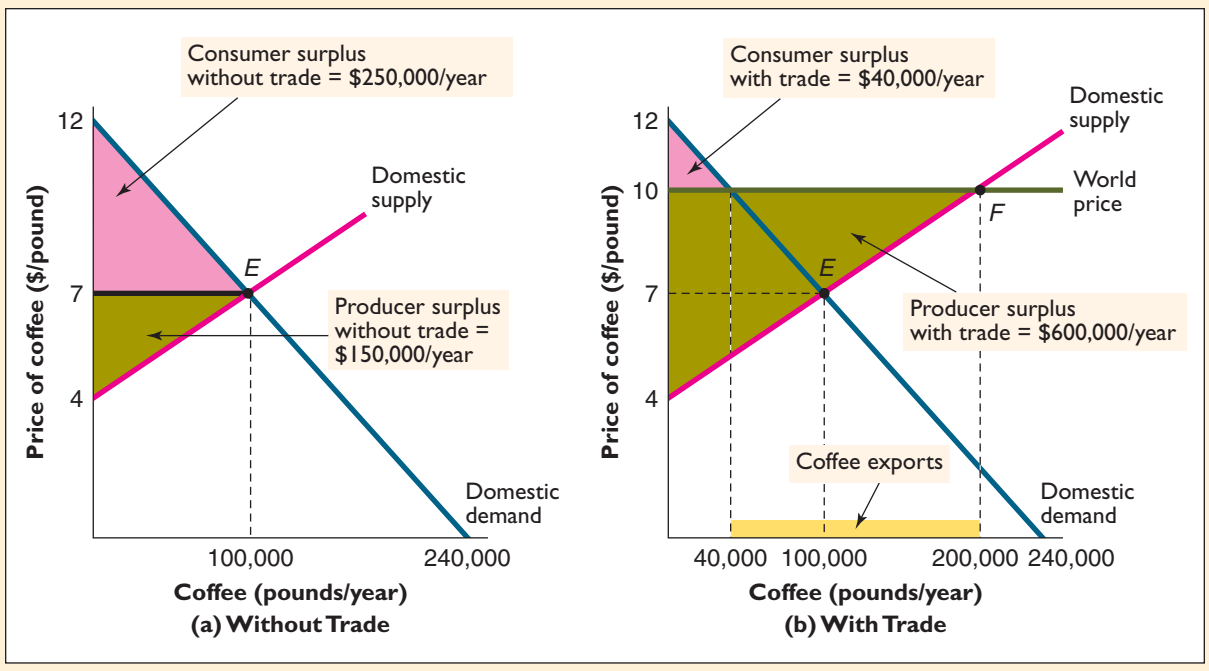


FIGURE 9.7

The Market for Coffee in Costa Rica.

With no international trade (a), the equilibrium price and quantity of coffee in Costa Rica are determined by the intersection of the domestic supply and demand curves (point *E*). But if the country opens to trade (b), the domestic price of coffee must equal the world price. At the higher world price, Costa Ricans will demand only 40,000 pounds of coffee each year, which is less than the 200,000 pounds Costa Rican producers supply at that price. The difference, 160,000 pounds of coffee, is exported from Costa Rica each year. Compared to the closed-economy outcome, domestic coffee buyers suffer a loss of $210,000 per year of consumer surplus from trade, and domestic coffee sellers gain $450,000 per year of producer surplus from trade. For Costa Rican coffee buyers and sellers as a whole, total economic surplus is thus $240,000 per year larger with trade.

Figure 9.6(b) shows the world price of $1,000 per computer as being lower than Costa Rica's closed-economy price of $1,400.

If Costa Ricans are free to buy and sell computers on the international market, then the price of computers in Costa Rica must be the same as the world price. (No one in Costa Rica will buy a computer at a price above the world price, and no one will sell one at a price below the world price.) Figure 9.6(b) shows that at the world price, Costa Rican consumers and firms demand 2,800 computers each year, but Costa Rican computer producers will supply only 1,200. The difference between the two quantities, 1,600, is the number of computers that Costa Rica must import from abroad each year. Figure 9.6(b) illustrates a general conclusion: *If the price of a good or service in a closed economy is greater than the world price, and that economy opens itself to trade, the economy will tend to become a net importer of that good or service.*

Note in Figure 9.6(b) that domestic computer buyers now enjoy $1,960,000 per year of consumer surplus, or $960,000 per year more than before trade. Domestic computer producers, for their part, now receive only $360,000 per year of producer surplus, or $640,000 less than before trade. On balance, then, domestic participants in the Costa Rican computer market experience a net increase of $320,000 per year in total economic surplus.

A different outcome occurs in Costa Rica's coffee market, shown in Figure 9.7. The price of coffee is shown on the vertical axis and the quantity of coffee on the horizontal axis. The downward-sloping demand curve in the figure shows how

much coffee Costa Rican consumers want to buy at each price, and the upward-sloping supply curve, how much coffee Costa Rican producers are willing to supply at each price. If Costa Rica's economy is closed to trade with the rest of the world, then equilibrium in the market for coffee will occur at point *E*, where the domestic demand and supply curves intersect. The quantity produced will be 100,000 pounds of coffee each year and the price will be $7 per pound of coffee, as shown in Figure 9.7(a). Domestic coffee buyers enjoy a consumer surplus of $250,000 per year and domestic coffee producers enjoy a producer surplus of $150,000 per year.

Now imagine that Costa Rica opens its coffee market to international trade. As in the case of computers, if free trade in coffee is permitted, then the prevailing price for coffee in Costa Rica must be the same as the world price. Unlike the case of computers, however, the world price of coffee as shown in Figure 9.7(b) is *higher* than the domestic equilibrium price. We know that the world price of coffee will be higher than the domestic price because, in an example with only two goods, if non–Costa Rican producers have a comparative advantage in computers, as reflected in the fact that computers exchange for coffee at a lower price in the world market than in the domestic Costa Rican market, then Costa Rican producers must have a comparative advantage in coffee. And that means that the domestic price of coffee in Costa Rica without trade will be lower than the world price.

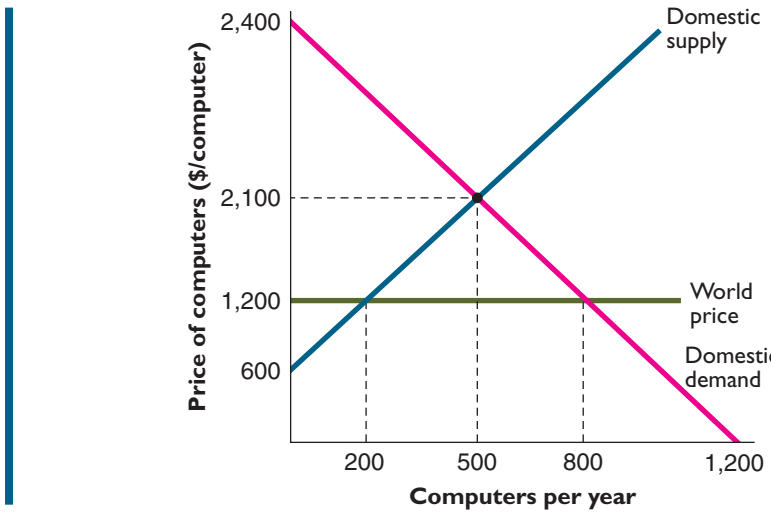
Figure 9.7(b) shows that at the world price for coffee, Costa Rican producers are willing to supply 200,000 pounds of coffee each year, while Costa Rican consumers want to purchase a much smaller amount, only 40,000 pounds. The difference between domestic production and domestic consumption, 200,000 − 40,000 = 160,000 pounds per year, is exported to the world market each year. Note in Figure 9.7(b) that domestic coffee buyers now enjoy a consumer surplus of $40,000 per year, a reduction of $210,000 per year in comparison with the surplus they enjoyed without trade. But domestic coffee producers now receive $600,000 per year of producer surplus, or $450,000 per year more than before trade. As in the case of the domestic computer market, domestic participants in the Costa Rican coffee market come out ahead on balance. Their total economic surplus is $240,000 per year higher as a result of opening the coffee market to trade. Note, finally, that the proceeds from the export of coffee ($1,600,000 per year) is just enough to enable the Costa Ricans to pay for the 1,600 computers per year they import (see Figure 9.6(b)).

The general conclusion of Figure 9.7 is this: *If the price of a good or service in a closed economy is lower than the world price, and that economy opens itself to trade, the economy will tend to become a net exporter of that good or service.* And again the result will be a net increase in the total economic surplus experienced by domestic buyers and sellers.

These examples illustrate how the market translates comparative advantage into mutually beneficial gains from trade. If trade is unrestricted, then countries with a comparative advantage in a particular good will profit by supplying that good to the world market and using the revenue earned to import goods in which they do not have a comparative advantage. Thus, the workings of the free market automatically ensure that goods will be produced where the opportunity cost is lowest, leading to the highest possible consumption possibilities for the world as a whole.

EXERCISE 9.4

If the domestic supply and demand curves for computers in Islandia are as shown in the diagram and the world price of computers is $1,200, how will opening the country to the possibility of buying computers in the world market affect consumer and producer surpluses in its domestic computer market?



WINNERS AND LOSERS FROM TRADE

If trade is so wonderful, why do politicians so often resist free trade and "globalization"? The reason, as we have already seen, is that although free trade benefits the economy as a whole, specific groups may not benefit. If groups who are hurt by trade have sufficient political influence, they may be able to persuade politicians to enact policies that restrict the free flow of goods and services across borders.

The supply-and-demand analyses shown in Figures 9.6 and 9.7 are useful in understanding who gains and who loses when an economy opens up to trade. Look first at Figure 9.6, which shows the market for computers in Costa Rica. When Costa Rica opens its computer market to international competition, Costa Rican consumers enjoy a larger quantity of computers at a lower price. Clearly, Costa Rican computer users benefit from the free trade in computers. In general, *domestic consumers of imported goods benefit from free trade*. However, Costa Rican computer producers will not be so happy about opening their market to international competition. The fall in computer prices to the international level implies that less efficient domestic producers will go out of business, and that those who remain will earn lower profits. Unemployment in the Costa Rican computer industry will rise and may persist over time, particularly if displaced computer workers cannot easily move to a new industry.[2] We see that, in general, *domestic producers of imported goods are hurt by free trade*.

Consumers are helped, and producers hurt, when imports increase. The opposite conclusions apply for an increase in exports (see Figure 9.7). In the example of Costa Rica, an opening of the coffee market raises the domestic price of coffee to the world price and creates the opportunity for Costa Rica to export coffee. Domestic producers of coffee benefit from the increased market (they can now sell coffee abroad as well as at home) and from the higher price of their product. In short, *domestic producers of exported goods benefit from free trade*. Costa Rican coffee drinkers will be less enthusiastic, however, since they must now have to pay the higher world price of coffee, and will therefore consume less. *Thus, domestic consumers of exported goods are hurt by free trade*.

Free trade is *efficient,* in the sense that it increases the total economic surplus available to the economy. Indeed, the efficiency of free trade is an application of the

[2]The wages paid to Costa Rican computer workers also will fall, reflecting the lower relative price of computers. The other side of this coin, however, is that the wages paid to Costa Rican coffee growers will rise.

RECAP **TRADE WINNERS AND LOSERS**

Winners

- Consumers of imported goods
- Producers of exported goods

Losers

- Consumers of exported goods
- Producers of imported goods

equilibrium principle, that markets in equilibrium leave no unexploited opportunities for individuals. Despite the efficiency of free trade, however, some groups lose from trade, which generates political pressures to block or restrict trade. In the next section we will discuss the major types of policies used to restrict trade.

PROTECTIONIST POLICIES: TARIFFS AND QUOTAS

protectionism the view that free trade is injurious and should be restricted

The view that free trade is injurious and should be restricted is known as **protectionism.** Supporters of this view believe the government should attempt to "protect" domestic markets by raising legal barriers to imports. (It is interesting that protectionists rarely attempt to restrict exports, even though they hurt consumers of the exported good.) Two of the most common types of such barriers are *tariffs* and *quotas*. A **tariff** is a tax imposed on an imported good. A **quota** is a legal limit on the quantity of a good that may be imported.

tariff a tax imposed on an imported good

quota a legal limit on the quantity of a good that may be imported

Tariffs

The effects of tariffs and quotas can be explained using supply-and-demand diagrams. Suppose that Costa Rican computer makers, dismayed by the penetration of "their" market by imported computers, persuade their government to impose a tariff—that is, a tax—on every computer imported into the country. Computers produced in Costa Rica will be exempt from the tax. Figure 9.8 shows the likely effects of this tariff on the domestic Costa Rican computer market. The lower of the two horizontal lines in Figure 9.8(a) indicates the world price of computers, not including the tariff—shown in the diagram as $1,000 per computer. The higher of the two lines indicates the price Costa Rican consumers will actually pay for imported computers, including the tariff, shown in the diagram as $1,200 per computer. The vertical distance between the two lines equals the amount of the tariff that is imposed on each imported computer—here, $200 per computer.

From the point of view of domestic Costa Rican producers and consumers, the imposition of the tariff has the same effects as an equivalent increase in the world price of computers. Because the price (including the tariff) of imported computers has risen, Costa Rican computer producers will be able to raise the price they charge for their computers to the world price plus tariff, or $1,200 per computer. Thus, the price Costa Rican consumers must pay—whether their computers are imported or not—equals $1,200 per computer, represented by the upper horizontal line in Figure 9.8.

The rise in the price of computers created by the tariff affects the quantities of computers supplied and the quantities demanded by Costa Ricans. Domestic computer producers, facing a higher price for computers, increase their production from 1,200 to 1,600 computers per year (see Figure 9.8(b)). Costa Rican consumers, also reacting to the higher price, reduce their computer purchases from 2,800 to 2,400 per year. As a result, the number of imported computers—the

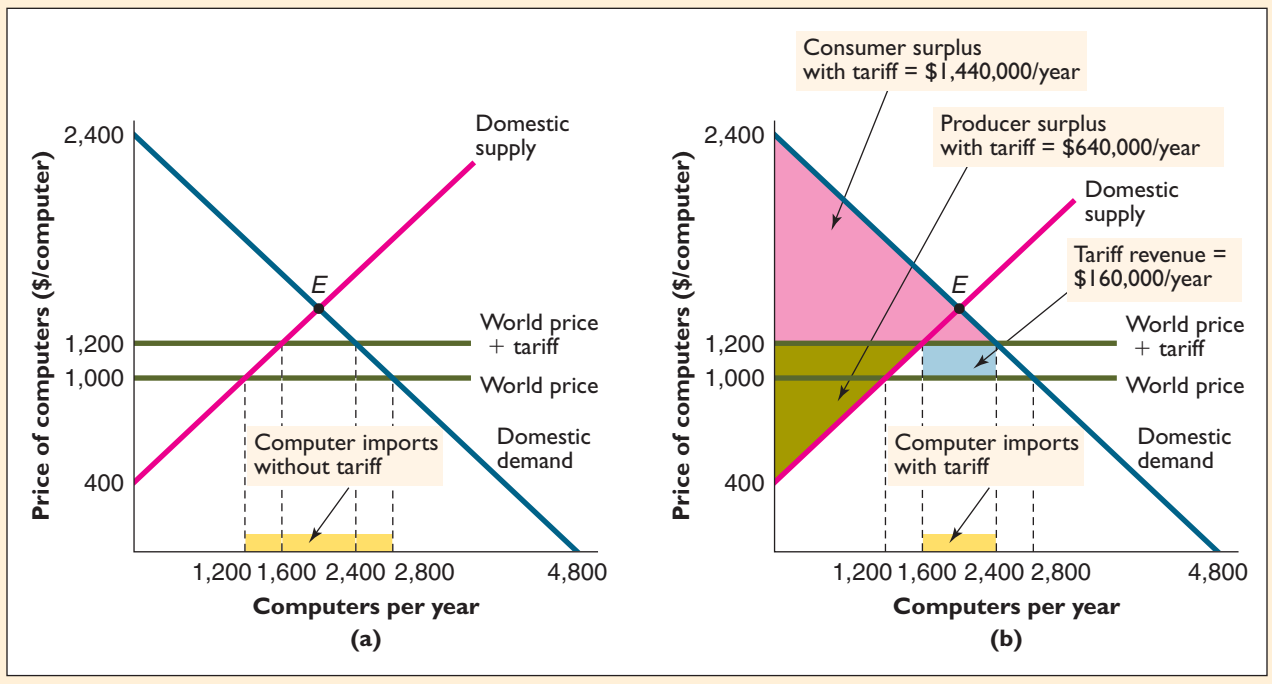


FIGURE 9.8

The Market for Computers after the Imposition of an Import Tariff.

The imposition of a tariff of $200 per imported computer raises the price of computers in Costa Rica from the world price ($1,000) to the world price plus the tariff ($1,200), represented by the upper horizontal line. Domestic production of computers rises from 1,200 to 1,600 per year. Domestic purchases of computers fall from 2,800 to 2,400 per year, and computer imports fall from 1,600 to 800 per year. Compared to the alternative of free trade (Figure 9.6(b)), Costa Rican computer buyers lose $520,000 per year of consumer surplus, and Costa Rican producers of computers gain $280,000 per year of producer surplus. The Costa Rican government collects revenue from the tariff equal to $160,000 per year, the area of the pale blue rectangle. The net effect of the tariff in the computer market is thus a reduction in total economic surplus of $80,000 per year.

difference between domestic purchases and domestic production—falls from 1,600 to 800 per year.

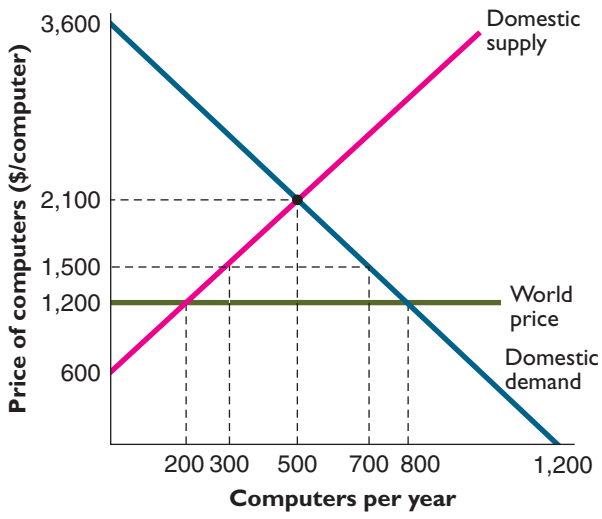
Who are the winners and the losers from the tariff, then? Relative to an environment with free trade and no tariff, the winners are the domestic computer producers and the losers are Costa Rican consumers, who must now pay more for their computers. Another winner is the government, which collects revenue from the tariff. The blue area in Figure 9.8(b) shows the amount of revenue the government collects, equal to the quantity of computer imports after the imposition of the tariff, 800 per year, times the amount of the tariff, $200 per computer, for a total of $160,000 per year.

How does the tariff affect total economic surplus? From Figure 9.6(b), recall that computer buyers reaped a consumer surplus of $1,960,000 per year under free trade. In Figure 9.8(b), we see that imposition of the $200 tariff on computers results in a consumer surplus of only $1,440,000 per year, a decline of $520,000 per year. Similarly, we saw in Figure 9.6(b) that domestic computer sellers reaped a producer surplus of $360,000 per year in the absence of tariffs. In Figure 9.8(b), note that the producer surplus rises to $640,000 per year with the imposition of the $200 tariff, a gain for producers of $280,000 per year. And note finally in Figure 9.8(b) that the government collects $160,000 per year in tariff revenue. Taking all these changes into account, the net effect of the imposition of the tariff is to cause a reduction in total economic surplus of $80,000 per year:

$$-\$520{,}000/\text{year} + \$280{,}000/\text{year} + \$160{,}000/\text{year} = -\$80{,}000/\text{year}$$

EXERCISE 9.5

If Islandia's supply and demand curves in its domestic computer market are as shown and buyers are currently able to import computers at the world price of $1,200, how will the imposition of a tariff of $300 per computer affect total economic surplus?



Why did President George W. Bush support the imposition of tariffs on steel imported into the United States?

In March of 2002, the Bush administration imposed tariffs ranging from 8 to 30 percent on most steel imports from Europe, Asia, and South America. This move drew heavy criticism from economists, who argued that it was inconsistent with the pro-trade position on which the president had campaigned for office in 2000. Why did the president impose these tariffs?

As administration officials openly acknowledged, the decision was influenced by the desire to help ease unemployment in the rust belt states of the upper Midwest, whose steel producers had seen their market shares steadily eroding in the face of foreign competition. Ohio, Michigan, Pennsylvania, and West Virginia were all viewed as key political battleground states as the administration looked ahead to the 2004 election.

This episode provides a measure of the strength of political pressures that emerge when economic interests become threatened. Although, as we have seen, tariffs reduce total economic surplus, they can increase the economic surplus of some groups, or at least postpone further reductions in their economic surplus. The short-term threat to domestic employment in the context of an anticipated close election was the political force behind the imposition of the tariffs. And in the end, it was the response of those whose interests were threatened by the tariffs themselves that led the Bush administration to remove them. In November of 2003, the World Trade Organization ruled the steel tariffs illegal and threatened to impose sanctions on up to $2.2 billion in exports from the United States. Faced with the possibility of retaliatory tariffs on orange juice and other citrus products from Florida, motorcycles, farm machinery, textiles, shoes, and other products, the Bush administration lifted its steel tariffs in December of 2003.

ECONOMIC NATURALIST 9.2

Why did President Bush impose tariffs on steel during his first term in office?

Quotas

An alternative to a tariff is a quota, or legal limit, on the number or value of foreign goods that can be imported. One means of enforcing a quota is to require importers to obtain a license or permit for each good they bring into the country. The

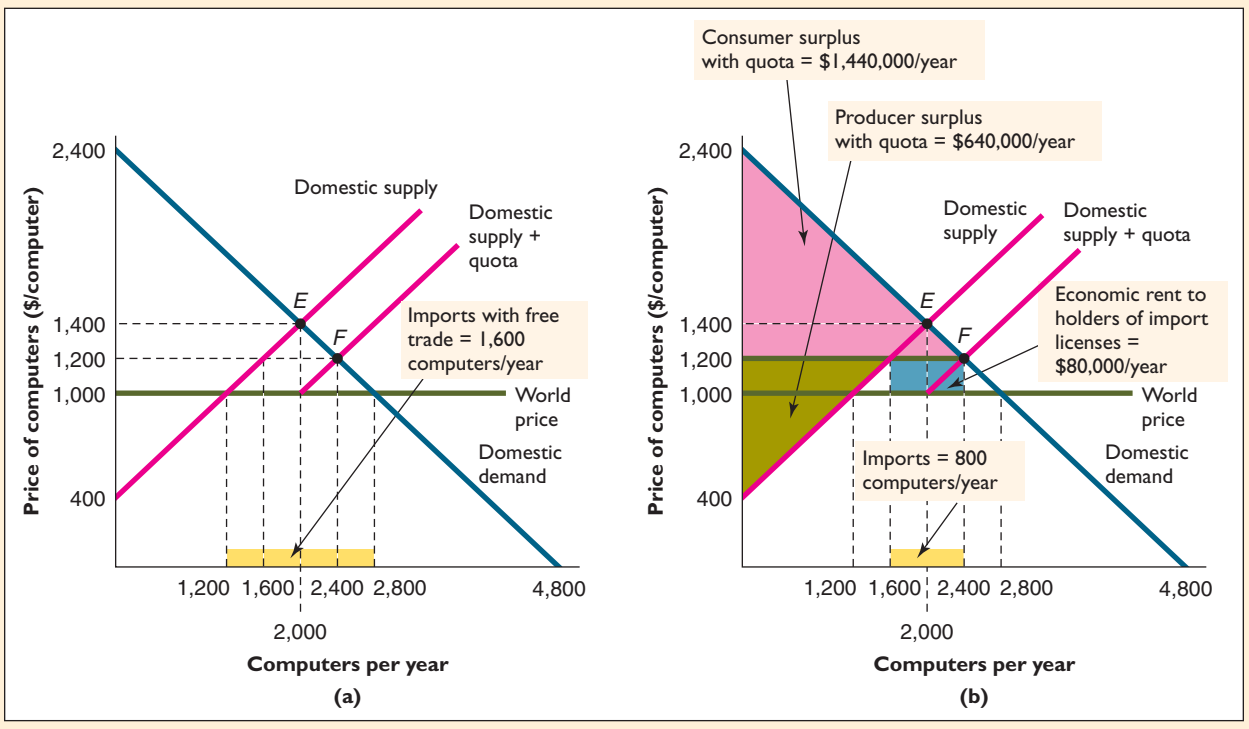


FIGURE 9.9

The Market for Computers after the Imposition of an Import Quota.

The figure shows the effects of the imposition of an import quota of 800 computers per year. The total supply of computers to the domestic economy is the domestic supply curve shifted to the right by 800 units (the amount of imports allowed under the quota). Market equilibrium occurs at point *F*. The effects of the quota on the domestic market are identical to those of the tariff analyzed in Figure 9.7. The domestic price rises from $1,000 to $1,200 per computer, domestic production of computers rises from 1,200 to 1,600 computers per year, domestic purchases of computers fall from 2,800 to 2,400 computers per year, and computer imports fall from 1,600 to 800 computers per year. Consumer and producer surpluses are the same under quotas as under tariffs. The tax revenue the government collected under the tariff goes instead as an economic rent to the holders of import licenses.

government then distributes exactly the same number of permits as the number of goods that may be imported under the quota.

How does the imposition of a quota on, say, computers affect the domestic market for computers? The effect is shown in Figure 9.9, which is similar to Figure 9.7. As before, assume that at first there are no restrictions on trade. Consumers pay the world price for computers, and 1,600 computers are imported each year (Figure 9.9(a)). Now suppose once more that domestic computer producers complain to the government about competition from foreign computer makers, and the government agrees to act. However, this time, instead of a tariff, the government imposes a quota on the number of computers that can be imported. For comparability with the tariff analyzed in Figure 9.7, let's assume that the quota permits the same level of imports as entered the country under the tariff: specifically, 800 computers per year. What effect does this ruling have on the domestic market for computers?

After the imposition of the quota, the quantity of computers supplied to the Costa Rican market is the production of domestic firms plus the 800 imported computers allowed under the quota. Figure 9.9(a) shows the quantity of computers supplied inclusive of the quota. The total supply curve, labeled "Domestic supply plus quota," is the same as the domestic supply curve except for one change: For all prices above the world price of $1,000 per computer, it is shifted 800 units to the

right. (Even though the quota would allow foreign producers to sell 800 units at prices below $1,000, none would do so, because they could get $800 for them in the world market.) The domestic demand curve is the same as in Figure 9.7. Equilibrium in the domestic market for computers occurs at point *F* in Figure 9.9(a), at the intersection of the supply curve including the quota and the domestic demand curve.

The figure shows that, relative to the initial situation with free trade, the quota (1) raises the domestic price of computers by $200 per computer above the world price; (2) reduces domestic purchases of computers from 2,800 to 2,400 computers per year; (3) increases domestic production of computers from 1,200 to 1,600 computers per year; and (4) reduces imports from 1,600 to 800 computers per year, the full amount permitted under the quota. Similarly, note in Figure 9.9(b) that both consumer surplus and producer surplus are the same in the domestic computer market under a quota as they were in that market under a tariff (Figure 9.8(b)). So, like a tariff, the quota helps domestic producers by increasing their sales and the price they receive for their output, while hurting domestic consumers by forcing them to pay a higher price.

Under our assumption that the quota is set so as to permit the same level of imports as the tariff, the effects on the domestic market of the tariff (Figure 9.8) and the quota (Figure 9.9) are not only similar, they are *identical*. Comparing Figures 9.8 and 9.9, you can see that the two policies have precisely the same effects on the domestic price, domestic purchases, domestic production, and imports.

Although the market effects of a tariff and a quota are the same, there is one important difference between the two policies, which is that a tariff generates revenue for the government, while a quota does not. With a quota, the revenue that would have gone to the government goes instead as an economic rent to those firms who hold the import licenses. A holder of an import license can purchase a computer at the world price of $1,000 and resell it in the domestic market at price of $1,200, pocketing the difference. This difference is an economic rent, much like the economic rent received by the owner of a taxi medallion (see the previous chapter). As long as the number of licenses is fixed, it cannot be competed away. Thus, with a tariff, the government collects the difference between the world price and the domestic market price of the good; with a quota, private firms or individuals collect that difference, in both cases $80,000 per year.

Why then would the government ever impose a quota rather than a tariff? One possibility is that the distribution of import licenses is a means of rewarding the government's political supporters. Sometimes, international political concerns also may play a role (see Economic Naturalist 9.3 for a possible example).

Who benefited from, and who was hurt by, voluntary export restraints on Japanese automobiles in the 1980s?

ECONOMIC NATURALIST 9.3

After the oil price increases of the 1970s, American consumers began to buy small, fuel-efficient Japanese automobiles in large numbers. Reeling from the new foreign competition, U.S. automobile producers petitioned the U.S. government for assistance. In response, in May 1981 the U.S. government negotiated a system of so-called *voluntary export restraints*, or VERs, with Japan. Under the VER system, each Japanese auto producer would "voluntarily" restrict exports to the United States to an agreed-upon level. VER quotas were changed several times before the system was formally eliminated in 1994. Who benefited from, and who was hurt by, VERs on Japanese automobiles?

Several groups benefited from the VER system. As should be expected, U.S. auto producers saw increased sales and profits when their Japanese competition was reduced. But Japanese automobile producers also profited from the policy, despite the reduction in their U.S. sales. The restrictions on the supply of their

automobiles to the U.S. market allowed them to raise their prices in the U.S market significantly—by several thousand dollars per car by the latter part of the 1980s, according to some estimates. From an economic point of view, the VERs functioned like a tariff on Japanese cars, except that the Japanese automobile producers, rather than the U.S. government, got to keep the tariff revenue. A third group that benefited from the VERs was European automobile producers, who saw U.S. demand for their cars rise when Japanese imports declined.

The biggest losers from the VER system were clearly American car buyers, who faced higher prices (particularly for Japanese imports) and reduced selection. During this period, dealer discounts on new Japanese cars largely disappeared, and customers often found themselves paying a premium over the list price. Because the economic losses faced by American car buyers exceeded the extra profits received by U.S. automobile producers, the VERs produced a net loss for the U.S. economy that at its greatest was estimated at more than $3 billion per year.

The U.S. government's choice of a VER system, rather than a tariff or a quota, was somewhat puzzling. If a tariff on Japanese cars had been imposed instead of a VER system, the U.S. government would have collected much of the revenue that went instead to Japanese auto producers. Alternatively, a quota system with import licenses given to U.S. car dealers would have captured some revenue for domestic car dealers rather than Japanese firms. The best explanation for why the U.S. government chose VERs is probably political. U.S. policymakers may have been concerned that the Japanese government would retaliate against U.S. trade restrictions by imposing its own restrictions on U.S. exports. By instituting a system that did minimal financial harm to—or even helped—Japanese auto producers, they may have hoped to avoid retaliation from the Japanese.[3]

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Who benefited from "voluntary" export restraints on Japanese cars?

Tariffs and quotas are not the only barriers to trade that governments erect. Importers may be subject to unnecessarily complex bureaucratic rules (so-called red-tape barriers), and regulations of goods that are nominally intended to promote health and safety sometimes have the side effect, whether intentionally or unintentionally, of restricting trade. One example is European restrictions on imports of genetically modified foods. Although these regulations were motivated in part by concerns about the safety of such foods, they also help to protect Europe's politically powerful farmers from foreign competition.

THE INEFFICIENCY OF PROTECTIONISM

Free trade is efficient because it allows countries to specialize in the production of goods and services in which they have the greatest comparative advantage. Conversely, protectionist policies that limit trade are inefficient—they reduce total economic surplus. (Recall Chapter 3's *efficiency principle*, that efficiency is an important social goal.) Why, then, do governments adopt such policies? The reason is similar to why some city governments impose rent controls (see Chapter 3). Although rent controls reduce economic welfare overall, some people benefit from them—namely, the tenants whose rents are held artificially below market level. Similarly, as we have seen in this section, tariffs and quotas benefit certain groups. Because those who benefit from these restrictions (such as firms facing import competition) are often better organized politically than those who lose from trade barriers (such as consumers in general), lawmakers are sometimes persuaded to enact the restrictions.

The fact that free trade is efficient suggests an alternative to trade restrictions, however. Because eliminating restrictions on trade increases total economic surplus, in

[3]President Reagan's autobiography confirms that policymakers were concerned that an alternative method of limiting Japanese imports would provoke the Japanese into taking measures to limit U.S. exports to Japan. See Ronald Reagan, *An American Life* (New York: Simon and Schuster, 1990), p. 274.

general the winners from free trade will be able to compensate the losers in such a way that everyone becomes better off. Government programs that assist and retrain workers displaced by import competition are an example of such compensation. As the incentive principle reminds us, people are likely to resist policy changes that threaten their incomes. Spreading the benefits of free trade—or at least reducing its adverse effects on certain groups—reduces the incentives of those groups to inhibit free trade.

Although we have focused on the winners and losers from trade, not all opposition to free trade is motivated by economic interest. For example, many opponents of trade have focused on environmental concerns. Protecting the environment is an important and laudable goal, but once again the *efficiency principle* suggests that restricting trade is not the most effective means of achieving that goal. Restricting trade lowers world income, reducing the resources available to deal with environmental problems. (High levels of economic development are in fact associated with lower, not higher, amounts of pollution.) Furthermore, much of the income loss arising from barriers to trade is absorbed by poor nations trying to develop their economies. For this reason, leaders of developing countries are among the strongest advocates of free trade.

RECAP A SUPPLY-AND-DEMAND PERSPECTIVE ON TRADE

- For a closed economy, the domestic supply and demand for a good or service determine the equilibrium price and quantity of that good or service.
- In an open economy, the price of a good or service traded on international markets equals the *world price*. If the domestic quantity supplied at the world price exceeds the domestic quantity demanded, the difference will be exported to the world market. If the domestic quantity demanded at the world price exceeds the domestic quantity supplied, the difference will be imported.
- Generally, if the price of a good or service in a closed economy is lower than the world price, and the economy opens to trade, the country will become a net exporter of that good or service. If the closed-economy price is higher than the world price, and the economy opens to trade, the country will tend to become a net importer of the good or service.
- Consumers of imported goods and producers of exported goods benefit from trade, while consumers of exported goods and producers of imported goods are hurt by trade. If those groups that are hurt have sufficient political influence, they may persuade the government to enact barriers to trade. The view that free trade is injurious and should be restricted is called *protectionism*.
- The two most common types of trade barriers are *tariffs,* or taxes on imported goods, and *quotas*, legal limits on the quantity that can be imported. A tariff raises the domestic price to the world price plus the tariff. The result is increased domestic production, reduced domestic consumption, and fewer imports. A quota has effects on the domestic market that are similar to those of a quota. The main difference is that, under a quota, the government does not collect tariff revenue.
- Trade barriers are inefficient; they reduce the overall size of the economic pie. Thus, in general, the winners from free trade should be able to compensate the losers in such a way that everyone becomes better off. Government programs to help workers displaced by import competition are an example of such compensation.

OUTSOURCING

outsourcing a term increasingly used to connote having services performed by low-wage workers overseas

An issue very much in the news in recent years has been the **outsourcing** of U.S. service jobs. Although the term once primarily meant having services performed by subcontractors anywhere outside the confines of the firm, increasingly it connotes the act of replacing relatively expensive American service workers with much cheaper service workers in overseas locations.

A case in point is the transcription of medical records. In an effort to maintain accurate records, many physicians dictate their case notes for later transcription after examining their patients. In the past, transcription was often by the physician's secretary in spare moments. But secretaries also must attend to a variety of other tasks that disrupt concentration. They must answer phones, serve as receptionists, prepare correspondence, and so on. As insurance disputes and malpractice litigation became more frequent during the 1980s and 1990s, errors in medical records became much more costly to physicians. In response, many turned to independent companies that offered transcription services by full-time, dedicated specialists.

These companies typically served physicians whose practices were located in the same community. But while many of the companies that manage transcription services are still located in the United States, an increasing fraction of the actual work itself is now performed outside the United States. For example, Eight Crossings, a company headquartered in Northern California, enables physicians to upload voice dictation files securely to the Internet, whereupon they are transmitted to transcribers who perform the work in India. The finished documents are then transmitted back, in electronic form, to physicians, who may edit and even sign them online. The advantage for physicians, of course, is that the fee for this service is much lower than for the same service performed domestically, because wage rates in India are much lower than in the United States.

In China, Korea, Indonesia, India, and elsewhere, even highly skilled professionals still earn just a small fraction of what their counterparts in the United States are paid. Accordingly, companies face powerful competitive pressure to import not just low-cost goods from overseas suppliers, but also a growing array of professional services.

As Microsoft chairman Bill Gates put it in a 1999 interview,

> As a business manager, you need to take a hard look at your core competencies. Revisit the areas of your company that aren't directly involved in those competencies, and consider whether Web technologies can enable you to spin off those tasks. Let another company take over the management responsibilities for that work, and use modern communication technology to work closely with the people—now partners instead of employees are doing the work. In the Web work style, employees can push the freedom the Web provides to its limits.

In economic terms, the outsourcing of services to low-wage foreign workers is exactly analogous to the importation of goods manufactured by low-wage foreign workers. In both cases, the resulting cost savings benefit consumers in the United States. And in both cases, jobs in the United States may be put in jeopardy, at least temporarily. An American manufacturing worker's job is at risk if it is possible to import the good he produces from another country at lower cost. By the same token, an American service worker's job is at risk if a lower-paid worker can perform that same service somewhere else.

ECONOMIC NATURALIST 9.4

Is PBS economics reporter Paul Solman's job a likely candidate for outsourcing?

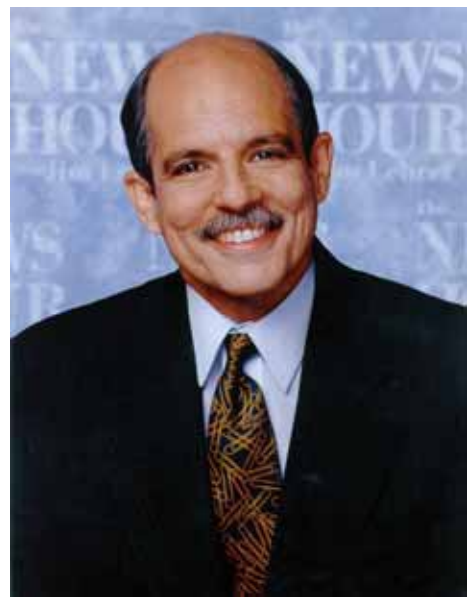
Paul Solman and his associate Lee Koromvokis produce video segments that provide in-depth analysis of current economic issues for the PBS evening news program *The NewsHour with Jim Lehrer*. Is it likely that his job will someday be outsourced to a low-wage reporter from Hyderabad?

In a recent book, the economists Frank Levy and Richard Murnane attempt to identify the characteristics of a job that make it a likely candidate for outsourcing.[4] In their view, any job that is amenable to computerization is also vulnerable to outsourcing. To computerize a task means to break it down into units that can be managed with simple rules. ATM machines, for example, were able to replace many of the tasks that bank tellers once performed, because it was straightforward to reduce these tasks to a simple series of questions that a machine could answer. By the same token, the workers in offshore call centers who increasingly book our airline and hotel reservations are basically following simple scripts much like computer programs.

So the less rules-based a job is, the less vulnerable it is to outsourcing. Safest of all are those that Levy and Murnane describe as "face-to-face" jobs. Unlike most rules-based jobs, these jobs tend to involve complex face-to-face communication with other people, precisely the kind of communication that dominates Mr. Solman's economics reporting.

In an interview for the *NewsHour*, Mr. Solman asked Mr. Levy what he meant, exactly, by "complex communication."

> "Suppose I say the word *bill,*" Levy responded, "and you hear that. And the question is what does that mean? . . . Am I talking about a piece of currency? Am I talking about a piece of legislation, the front end of a duck? The only way you're going to answer that is to think about the whole context of the conversation. But that's very complicated work to break down into some kind of software."[5]



Is a low-wage foreign economics reporter likely to replace Paul Solman?

Levy and Murnane describe a second category of tasks that are less vulnerable to outsourcing—namely, those that for one reason or another require the worker to be physically present. For example, it is difficult to see how someone in China or India could build an addition to someone's house in a Chicago suburb, or repair a blown head gasket on someone's Chevrolet Corvette in Atlanta, or fill a cavity in someone's tooth in Los Angeles.

So on both counts, Paul Solman's job appears safe for the time being. Because it involves face-to-face, complex communication, and because many of his interviews can be conducted only in the United States, it is difficult to see how a reporter from Hyderabad could displace him.

Of course, the fact that a job is relatively safe does not mean that it is completely sheltered. For example, although most dentists continue to think themselves immune from outsourcing, it is now possible for someone requiring extensive dental work to have the work done in New Delhi and still save enough to cover his airfare and a two-week vacation in India.

There are more than 135 million Americans in the labor force. Every three months or so, approximately 7 million of them lose their jobs and 7 million find new ones. At various points in your life, you are likely to be among this group in transition. In the long run, the greatest security available to you or any other worker is the ability to adapt quickly to new circumstances. Having a good education provides no guarantee against losing your job, but it should enable you to develop a comparative advantage at the kinds of tasks that require more than just executing a simple set of rules.

[4]Frank Levy and Richard Murnane, *The New Division of Labor: How Computers Are Creating the Next Job Market* (Princeton, NJ: Princeton University Press, 2004).
[5]http://www.pbs.org/newshour/bb/economy/july-dec04/jobs_8-16.html.

SUMMARY

- According to the principle of comparative advantage, the best economic outcomes occur when each nation specializes in the goods and services at which it is relatively most productive, and then trades with other nations to obtain the goods and services its citizens desire.

- The production possibilities curve (PPC) of a country is a graph that describes the maximum amount of one good that can be produced at every possible level of production of the other good. At any point the slope of a PPC indicates the opportunity cost, in terms of forgone production of the good on the vertical axis, of increasing production of the good on the horizontal axis by one unit. The more of a good that is already being produced, the greater the opportunity cost of increasing production still further. Thus, the slope of a PPC becomes more and more negative as we read from left to right. When an economy has many workers, the PPC has a smooth, outwardly bowed shape.

- A country's *consumption possibilities* are the combinations of goods and services that might feasibly be consumed by its citizens. In a *closed economy*—one that does not trade with other countries—the citizens' consumption possibilities are identical to their production possibilities. But in an *open economy* that does trade with other countries, consumption possibilities are typically greater than, and never less than, the economy's production possibilities. Graphically, an open economy's consumption possibilities are described by a downward-sloping line that just touches the PPC, whose slope equals the amount of the good on the vertical axis that must be traded to obtain one unit of the good on the horizontal axis. A country achieves its highest consumption possibilities by producing at the point where the consumption possibilities line touches the PPC and then trading to obtain the most preferred point on the consumption possibilities line.

- In a closed economy, the relative price of a good or service is determined at the intersection of the supply curve of domestic producers and the demand curve of domestic consumers. In an open economy, the relative price of a good or service equals the world price—the price determined by supply and demand in the world economy. If the price of a good or service in a closed economy is greater than the world price, and the country opens its market to trade, it will become a net importer of that good or service. But if the closed-economy price is below the world price, and the country opens itself to trade, it will become a net exporter of that good or service.

- Although free trade is beneficial to the economy as a whole, some groups—such as domestic producers of imported goods—are hurt by free trade. Groups that are hurt by trade may be able to induce the government to impose *protectionist* measures, such as tariffs or quotas. A *tariff* is a tax on an imported good that has the effect of raising the domestic price of the good. A higher domestic price increases domestic supply, reduces domestic demand, and reduces imports of the good. A *quota*, which is a legal limit on the amount of a good that may be imported, has the same effects as a tariff, except that the government collects no tax revenue. (The equivalent amount of revenue goes instead to those firms with the legal authority to import goods.) Because free trade is efficient, the winners from free trade should be able to compensate the losers so that everyone becomes better off. Thus, policies to assist those who are harmed by trade, such as assistance and retraining for workers idled by imports, are usually preferable to trade restrictions.

KEY TERMS

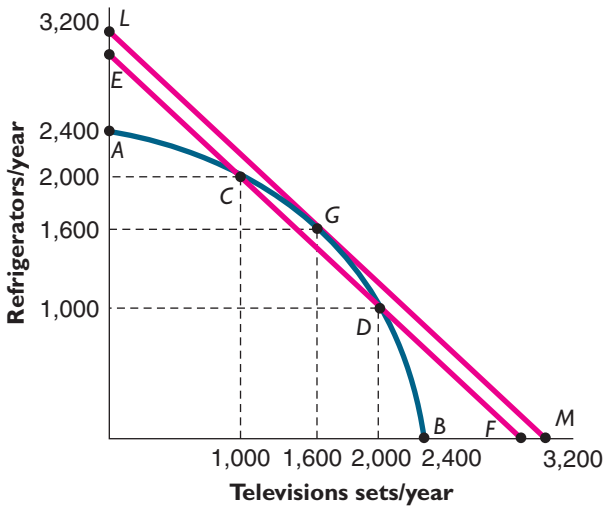
autarky (•••)
closed economy (•••)
consumption possibilities (•••)
open economy (•••)
outsourcing (•••)
protectionism (•••)
quota (•••)
tariff (•••)
world price (•••)

REVIEW QUESTIONS

1. Why are production possibilities curves often bowed outward from the origin?
2. What is meant by the *consumption possibilities* of a country? How are consumption possibilities related to production possibilities in a closed economy? In an open economy?
3. True or false and explain: If a country is more productive in every sector than a neighboring country, then there is no benefit in trading with the neighboring country.
4. Show graphically the effects of a tariff on imported automobiles on the domestic market for automobiles. Who is hurt by the tariff, and why? Who benefits, and why?
5. Show graphically the effects of a quota on imported automobiles on the domestic market for automobiles. Whom does the quota hurt, and who benefits? Explain.

PROBLEMS

Problems 1–5 refer to a small open economy whose production possibilities curve is as shown by the curve *ACGDB* in the diagram.

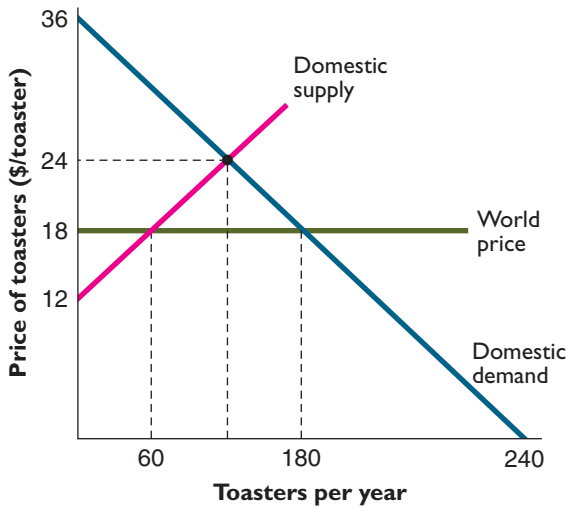


1. What is the maximum number of television sets this country can produce each year? What is the maximum number of refrigerators?
2. If refrigerators and television sets can each be bought or sold for $500 in the world market, what is the maximum number of refrigerators this country can consume each year? The maximum number of television sets? How would your answers change if refrigerators and television sets both sold for $1,000?
3. If refrigerators and television sets both sell for $1,000 in the world market, is it possible for this country to consume 1,000 television sets per year and 2,200 refrigerators? Could the country consume 1,000 refrigerators each year and 2,500 television sets?
4. If refrigerators and television sets both sell for $1,000 in the world market, how many units of each good should this country produce?
5. If the world price of refrigerators rose to $1,200 and the price of television sets remained $1,000, how will this country alter the mix of the two goods it produces? How will it alter the mix of the two goods it consumes?
6. A small open economy is equally productive in producing coffee and tea—that is, for each additional pound of coffee it produces, it must sacrifice the production of exactly one pound of tea. What will this economy produce if the world price of coffee is 20 percent higher than that of tea?
7. A developing economy requires 1,000 hours of work to produce a television set and 10 hours of work to produce a bushel of corn. This economy has available a total of 1,000,000 hours of work per day.
   a. Draw the PPC for daily output of the developing economy. Give numerical values for the PPC's vertical intercept, horizontal intercept, and slope. Relate the slope to the developing country's opportunity cost of producing each good. If this economy does not trade, what are its consumption possibilities?
   b. The developing economy is considering opening trade with a much larger, industrialized economy. The industrialized economy requires 10 hours of work to produce a television set and one hour of work to produce a bushel of corn. Show graphically how trading with the industrialized economy affects the developing economy's consumption possibilities. Is opening trade desirable for the developing economy?
8. Suppose that a U.S. worker can produce 1,000 pairs of shoes or 10 industrial robots per year. For simplicity, assume there are no costs other than labor costs and firms earn zero profits. Initially, the U.S. economy is closed. The domestic price of shoes is $30 per pair,

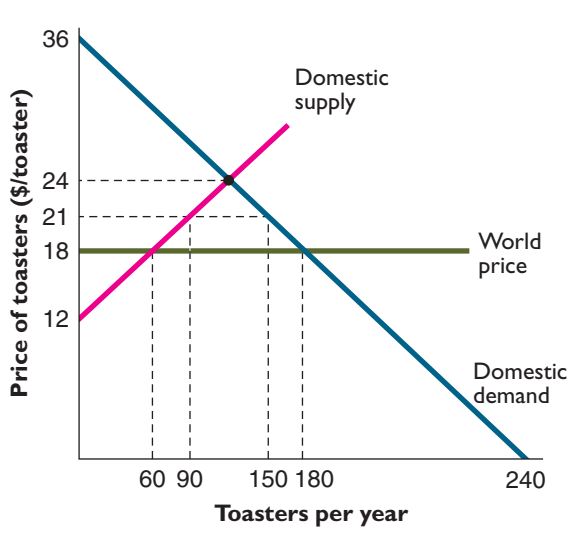
so a U.S. worker can earn $30,000 annually by working in the shoe industry. The domestic price of a robot is $3,000, so a U.S. worker also can earn $30,000 annually working in the robot industry. Now suppose that the United States opens trade with the rest of the world. Foreign workers can produce 500 pairs of shoes or one robot per year. The world price of shoes after the United States opens its markets is $10 per pair, and the world price of robots is $5,000.

a. Describe the new consumption possibilities curve for the United States.
b. What do foreign workers earn annually, in dollars?
c. When it opens to trade, which good will the United States import and which will it export?
d. Find the real income of U.S. workers after the opening to trade, measured in (1) the number of pairs of shoes annual worker income will buy and (2) the number of robots annual worker income will buy. Compare this real income to the situation before the opening of trade.
e. Does trading in goods produced by "cheap foreign labor" hurt U.S. workers?
f. How might your conclusion in part *c* be modified in the short term if it is costly for workers to change industries? What policy response might help with this problem?

9. If the domestic supply and demand curves for toasters in Islandia are as shown in the diagram and the world price of toasters is $18, how will opening the country to the possibility of buying toasters in the world market affect consumer and producer surpluses in its domestic computer market?

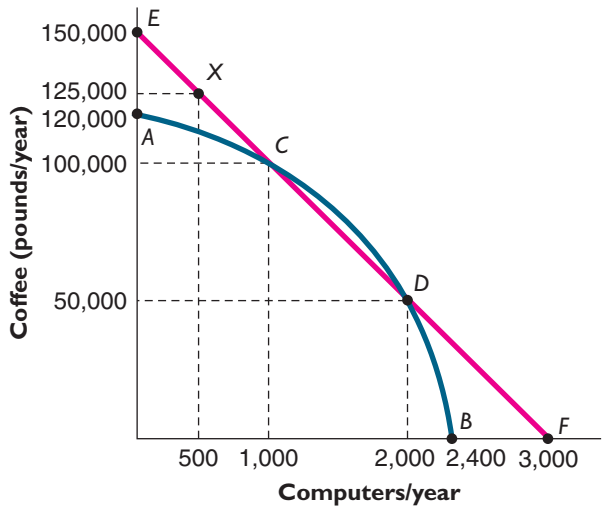


10. If Islandia's supply and demand curves in its domestic market for toasters are as shown and buyers are currently able to import toasters at the world price of $18, how will the imposition of a tariff of $3 per toaster affect total economic surplus?

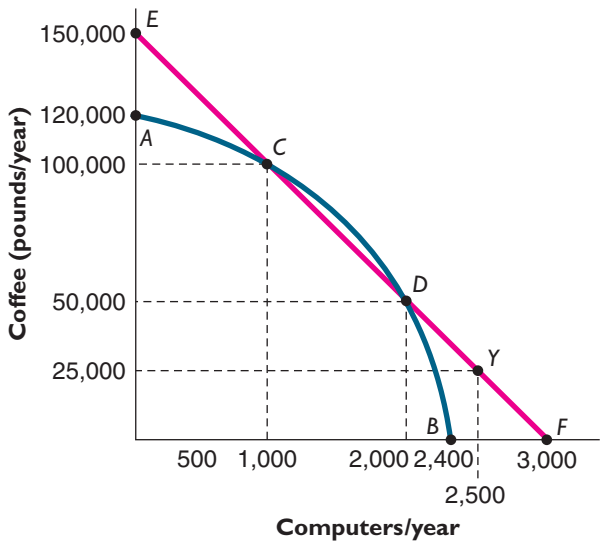


ANSWERS TO IN-CHAPTER EXERCISES

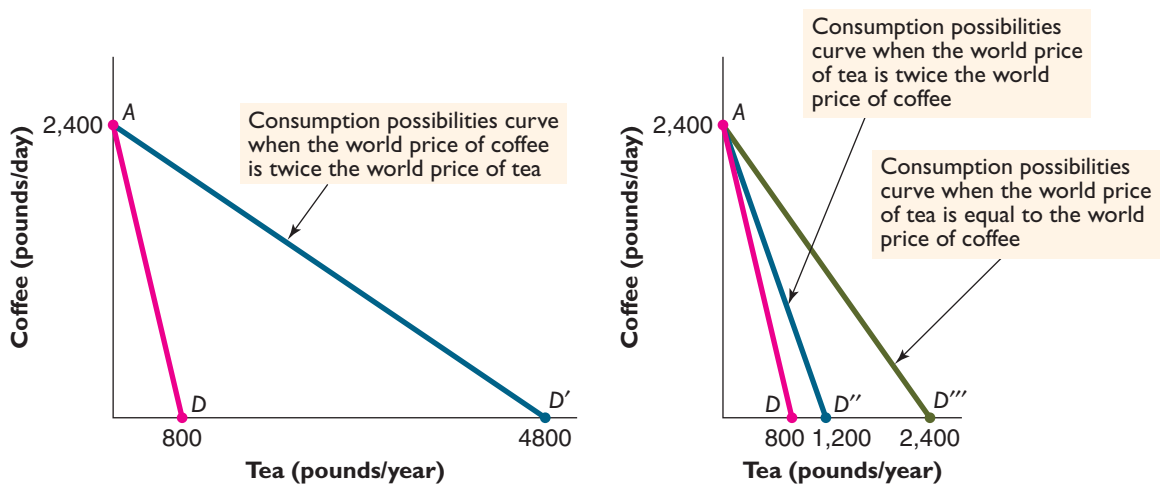
9.1 If Costa Rica produces at point *C* and can trade in the world market at the rate of 500 pounds of coffee per computer, it can sell 500 computers for 25,000 pounds of coffee. By so doing, Costa Rica can consume 125,000 pounds of coffee and 500 computers per year (point *X* in the diagram).



9.2 At the point *Y* in the diagram, Costa Rica consumes 2,500 computers per year and 25,000 pounds of coffee. Costa Rica can go from *C* to *Y* by selling 75,000 pounds of coffee in the world market at the world price of 0.02 computer per pound of coffee. At that price, its revenue from the sale of 75,000 pounds of coffee will enable it to purchase 2,000 computers.

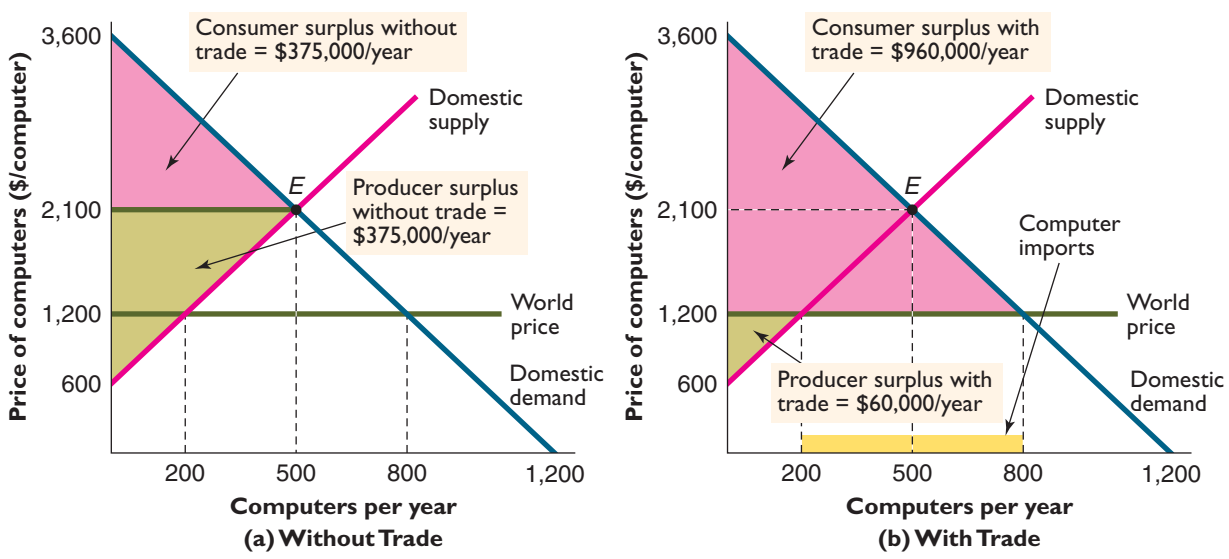


9.3 Now each Islandian worker can produce either 24 pounds of coffee per day or 8 pounds of tea. Workers who divide their time between the two activities will again produce each good in proportion to the amount of time spent producing it. Islandia's production possibilities curve will now be the line *AD* in the left panel of the diagram. If the world price of coffee is twice the world price of tea, Islandia should again specialize completely in coffee production. Its consumption possibilities curve is the line *AD′* in the left panel.



If the world price of tea is twice the world price of coffee, Islandians will still maximize their revenue from sales in world markets by specializing completely in coffee production. After all, an hour devoted to coffee production yields 24 pounds of coffee, which is enough to buy 12 pounds of tea at world prices, whereas an hour devoted to tea production would only yield 8 pounds of tea. In this case Islandia's consumption possibilities curve would be line *AD″* in the right panel of the diagram. Finally, if the world price of coffee is equal to the world price of tea, Islandia's consumption possibilities curve would be line *AD‴* in the right panel.

9.4 Domestic consumers and producers in the computer market each reaps a surplus of $375,000 per year in the absence of trade (left panel), for a total economic surplus of $750,000. With trade, the country imports 300 computers per year at the world price of $1,200 per computer. Computer buyers reap a consumer surplus of $960,000 per year, or $585,000 per year more than before trade. Computer sellers receive a producer surplus of $60,000 per year, or $315,000 less than before trade. The net gain in total economic surplus from trade is $270,000 per year.



9.5 Total economic surplus without the tariff is $1,020,000 per year (left panel). With the tariff, consumer surplus falls by $225,000 per year, producer surplus rises by $75,000 per year, and government revenue rises by $120,000 per year. The net decrease in total economic surplus caused by the tariff is $30,000 per year.