



After studying this chapter, you will be able to:

- ◆ Explain how markets work with international trade
- ◆ Identify the gains from international trade and its winners and losers
- ◆ Explain the effects of international trade barriers
- ◆ Explain and evaluate arguments used to justify restricting international trade

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GLOBAL MARKETS IN ACTION

IPods, Wii games, and Nike shoes are just three of the items you might buy that are not produced in the United States. In fact, most of the goods that you buy are produced abroad, often in Asia, and transported here in container ships and FedEx cargo jets. And it's not just goods produced abroad that you buy—it is services too. When you make a technical support call, most likely you'll be talking with someone in India, or to a voice recognition system that was programmed in India. Satellites or fiber cables will carry your conversation along with huge amounts of other voice messages, video images, and data.

All these activities are part of the globalization process that is having a profound effect on our lives. Globalization is controversial and generates heated debate. Many Americans want to know how we can compete with people whose wages are a fraction of our own.

Why do we go to such lengths to trade and communicate with others in faraway places? You will find some answers in this chapter. And in *Reading Between the Lines* at the end of the chapter, you can apply what you've learned and examine the effects of a tariff that the Obama government has put on tires imported from China.

◆ How Global Markets Work

Because we trade with people in other countries, the goods and services that we can buy and consume are not limited by what we can produce. The goods and services that we buy from other countries are our **imports**; and the goods and services that we sell to people in other countries are our **exports**.

International Trade Today

Global trade today is enormous. In 2009, global exports and imports were \$31 trillion, which is one half of the value of global production. The United States is the world's largest international trader and accounts for 10 percent of world exports and 13 percent of world imports. Germany and China, which rank 2 and 3 behind the United States, lag by a large margin.

In 2009, total U.S. exports were \$1.6 trillion, which is about 11 percent of the value of U.S. production. Total U.S. imports were \$2 trillion, which is about 14 percent of total expenditure in the United States.

We trade both goods and services. In 2009, exports of services were about 33 percent of total exports and imports of services were about 19 percent of total imports.

What Drives International Trade?

Comparative advantage is the fundamental force that drives international trade. Comparative advantage (see Chapter 2, p. 38) is a situation in which a person can perform an activity or produce a good or service at a lower opportunity cost than anyone else. This same idea applies to nations. We can define *national comparative advantage* as a situation in which a nation can perform an activity or produce a good or service at a lower opportunity cost than any other nation.

The opportunity cost of producing a T-shirt is lower in China than in the United States, so China has a comparative advantage in producing T-shirts. The opportunity cost of producing an airplane is lower in the United States than in China, so the United States has a comparative advantage in producing airplanes.

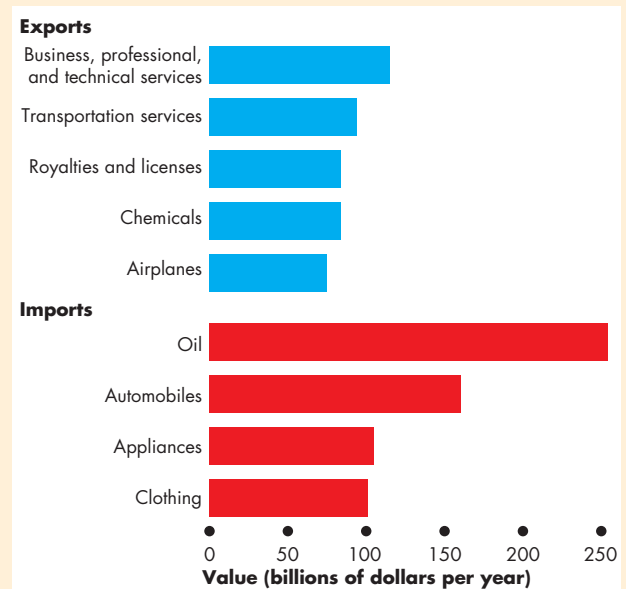
You saw in Chapter 2 how Liz and Joe reap gains from trade by specializing in the production of the good at which they have a comparative advantage and then trading with each other. Both are better off.

Economics in Action

Trading Services for Oil

Services top the list of U.S. exports and oil is the nation's largest import by a large margin.

The services that we export are business, professional, and technical services and transportation services. Chemicals were the largest category of goods that we exported in 2009.



U.S. Exports and Imports

Source of data: Bureau of Economic Analysis.

This same principle applies to trade among nations. Because China has a comparative advantage at producing T-shirts and the United States has a comparative advantage at producing airplanes, the people of both countries can gain from specialization and trade. China can buy airplanes from the United States at a lower opportunity cost than that at which Chinese firms can produce them. And Americans can buy T-shirts from China for a lower opportunity cost than that at which U.S. firms can produce them. Also, through international trade, Chinese producers can get higher prices for their T-shirts and Boeing can sell airplanes for a higher price. Both countries gain from international trade.

Let's now illustrate the gains from trade that we've just described by studying demand and supply in the global markets for T-shirts and airplanes.

Why the United States Imports T-Shirts

The United States imports T-shirts because the rest of the world has a comparative advantage in producing T-shirts. Figure 7.1 illustrates how this comparative advantage generates international trade and how trade affects the price of a T-shirt and the quantities produced and bought.

The demand curve D_{US} and the supply curve S_{US} show the demand and supply in the U.S. domestic market only. The demand curve tells us the quantity of T-shirts that Americans are willing to buy at various prices. The supply curve tells us the quantity of T-shirts that U.S. garment makers are willing to sell at various prices—that is, the quantity supplied at each price when all T-shirts sold in the United States are produced in the United States.

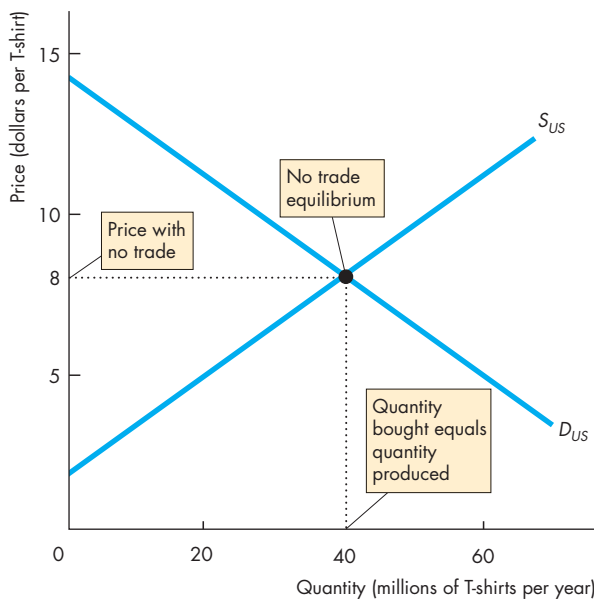
Figure 7.1(a) shows what the U.S. T-shirt market would be like with no international trade. The price

of a shirt would be \$8 and 40 million shirts a year would be produced by U.S. garment makers and bought by U.S. consumers.

Figure 7.1(b) shows the market for T-shirts with international trade. Now the price of a T-shirt is determined in the world market, not the U.S. domestic market. The world price is less than \$8 a T-shirt, which means that the rest of the world has a comparative advantage in producing T-shirts. The world price line shows the world price at \$5 a shirt.

The U.S. demand curve, D_{US} , tells us that at \$5 a shirt, Americans buy 60 million shirts a year. The U.S. supply curve, S_{US} , tells us that at \$5 a shirt, U.S. garment makers produce 20 million T-shirts a year. To buy 60 million T-shirts when only 20 million are produced in the United States, we must import 40 million T-shirts from the rest of the world. The quantity of T-shirts imported is 40 million a year.

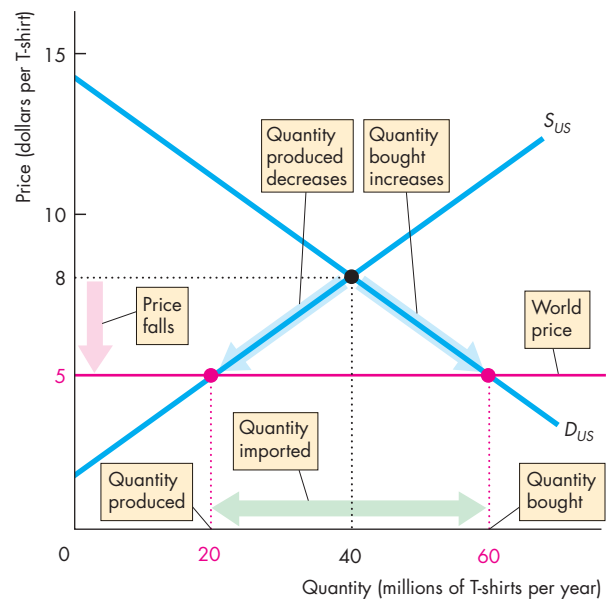
FIGURE 7.1 A Market with Imports



(a) Equilibrium with no international trade

Part (a) shows the U.S. market for T-shirts with no international trade. The U.S. domestic demand curve D_{US} and U.S. domestic supply curve S_{US} determine the price of a T-shirt at \$8 and the quantity of T-shirts produced and bought in the United States at 40 million a year.

Part (b) shows the U.S. market for T-shirts with interna-



(b) Equilibrium in a market with imports

tional trade. World demand and world supply determine the world price, which is \$5 per T-shirt. The price in the U.S. market falls to \$5 a shirt. U.S. purchases of T-shirts increase to 60 million a year, and U.S. production of T-shirts decreases to 20 million a year. The United States imports 40 million T-shirts a year.

Why the United States Exports Airplanes

Figure 7.2 illustrates international trade in airplanes. The demand curve D_{US} and the supply curve S_{US} show the demand and supply in the U.S. domestic market only. The demand curve tells us the quantity of airplanes that U.S. airlines are willing to buy at various prices. The supply curve tells us the quantity of airplanes that U.S. aircraft makers are willing to sell at various prices.

Figure 7.2(a) shows what the U.S. airplane market would be like with no international trade. The price of an airplane would be \$100 million and 400 airplanes a year would be produced by U.S. aircraft makers and bought by U.S. airlines.

Figure 7.2(b) shows the U.S. airplane market with international trade. Now the price of an airplane is determined in the world market and the world price is higher than \$100 million, which means that the United States has a comparative advantage in produc-

ing airplanes. The world price line shows the world price at \$150 million.

The U.S. demand curve, D_{US} , tells us that at \$150 million an airplane, U.S. airlines buy 200 airplanes a year. The U.S. supply curve, S_{US} , tells us that at \$150 million an airplane, U.S. aircraft makers produce 700 airplanes a year. The quantity produced in the United States (700 a year) minus the quantity purchased by U.S. airlines (200 a year) is the quantity of airplanes exported, which is 500 airplanes a year.

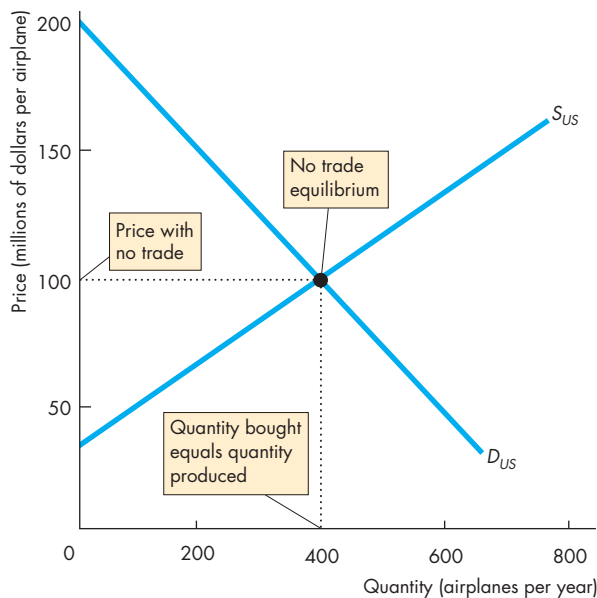
REVIEW QUIZ

- 1 Describe the situation in the market for a good or service that the United States imports.
- 2 Describe the situation in the market for a good or service that the United States exports.

You can work these questions in Study Plan 7.1 and get instant feedback.



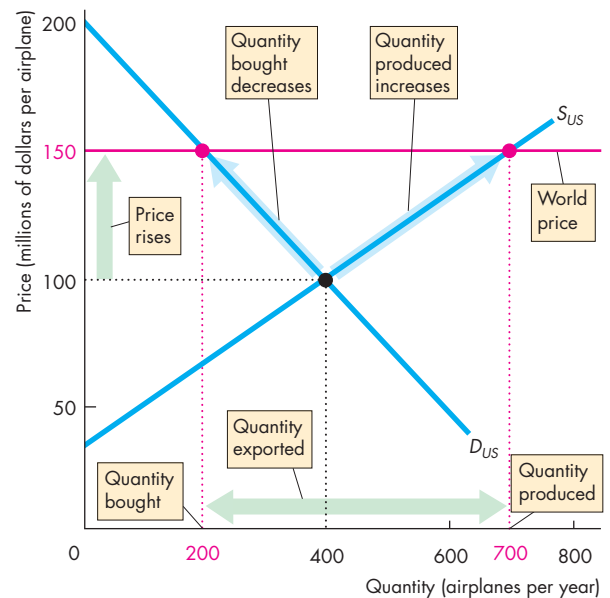
FIGURE 7.2 A Market with Exports



(a) Equilibrium without international trade

In part (a), the U.S. market with no international trade, the U.S. domestic demand curve D_{US} and the U.S. domestic supply curve S_{US} determine the price of an airplane at \$100 million and 400 airplanes are produced and bought each year.

In part (b), the U.S. market with international trade,



(b) Equilibrium in a market with exports

world demand and world supply determine the world price, which is \$150 million per airplane. The price in the U.S. market rises. U.S. airplane production increases to 700 a year, and U.S. purchases of airplanes decrease to 200 a year. The United States exports 500 airplanes a year.

Winners, Losers, and the Net Gain from Trade

In Chapter 1 (see p. 5), we asked whether globalization is in the self-interest of the low-wage worker in Malaysia who sews your new running shoes and the shoemaker in Atlanta—whether it is in the social interest. We’re now going to answer these questions. You will learn why producers complain about cheap foreign imports, but consumers of imports never complain.

Gains and Losses from Imports

We measure the gains and losses from imports by examining their effect on consumer surplus, producer surplus, and total surplus. In the importing country the winners are those whose surplus increases and the losers are those whose surplus decreases.

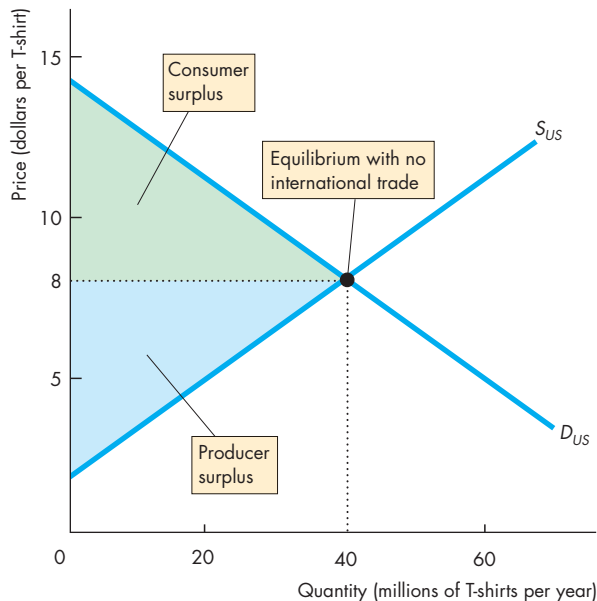
Figure 7.3(a) shows what consumer surplus and producer surplus would be with no international

trade in T-shirts. U.S. domestic demand, D_{US} , and U.S. domestic supply, S_{US} , determine the price and quantity. The green area shows consumer surplus and the blue area shows producer surplus. Total surplus is the sum of consumer surplus and producer surplus.

Figure 7.3(b) shows how these surpluses change when the U.S. market opens to imports. The U.S. price falls to the world price. The quantity bought increases to the quantity demanded at the world price and consumer surplus expands from A to the larger green area $A + B + D$. The quantity produced in the United States decreases to the quantity supplied at the world price and producer surplus shrinks to the smaller blue area C .

Part of the gain in consumer surplus, the area B , is a loss of producer surplus—a redistribution of total surplus. But the other part of the increase in consumer surplus, the area D , is a net gain. This increase in total surplus results from the lower price and increased purchases and is the gain from imports.

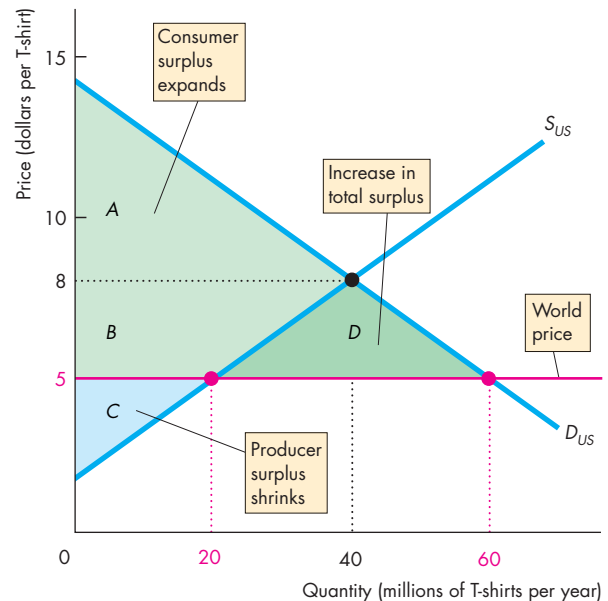
FIGURE 7.3 Gains and Losses in a Market with Imports



(a) Consumer surplus and producer surplus with no international trade

In part (a), with no international trade, the green area shows the consumer surplus and the blue area shows the producer surplus.

In part (b), with international trade, the price falls to the



(b) Gains and losses from imports

world price of \$5 a shirt. Consumer surplus expands from area A to the area $A + B + D$. Producer surplus shrinks to area C . Area B is a transfer of surplus from producers to consumers. Area D is an increase in total surplus—the gain from imports.

Gains and Losses from Exports

We measure the gains and losses from exports just like we measured those from imports, by their effect on consumer surplus, producer surplus, and total surplus.

Figure 7.4(a) shows the situation with no international trade. Domestic demand, D_{US} , and domestic supply, S_{US} , determine the price and quantity, the consumer surplus, and the producer surplus.

Figure 7.4(b) shows how the consumer surplus and producer surplus change when the good is exported. The price rises to the world price. The quantity bought decreases to the quantity demanded at the world price and the consumer surplus shrinks to the green area A . The quantity produced increases to the quantity supplied at the world price and the producer surplus expands to the blue area $B + C + D$.

Part of the gain in producer surplus, the area B , is a loss in consumer surplus—a redistribution of the total surplus. But the other part of the increase in producer surplus, the area D , is a net gain. This increase in total

surplus results from the higher price and increased production and is the gain from exports.

Gains for All

You've seen that both imports and exports bring gains. Because one country's exports are other countries' imports, international trade brings gain for all countries. International trade is a win-win game.

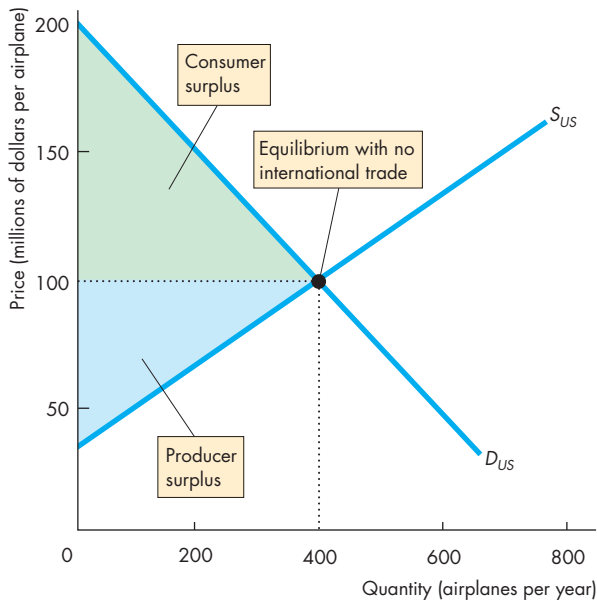
REVIEW QUIZ

- 1 How is the gain from imports distributed between consumers and domestic producers?
- 2 How is the gain from exports distributed between consumers and domestic producers?
- 3 Why is the net gain from international trade positive?

You can work these questions in Study Plan 7.2 and get instant feedback.

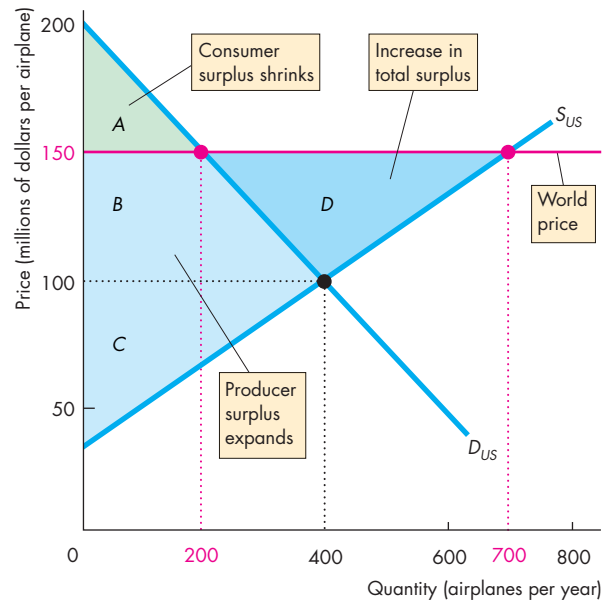


FIGURE 7.4 Gains and Losses in a Market with Exports



(a) Consumer surplus and producer surplus with no international trade

In part (a), the U.S. market with no international trade, the green area shows the consumer surplus and the blue area shows the producer surplus. In part (b), the U.S. market with international trade, the price rises to the world price.



(b) Gains and losses from exports

Consumer surplus shrinks to area A . Producer surplus expands from area C to the area $B + C + D$. Area B is a transfer of surplus from consumers to producers. Area D is an increase in total surplus—the gain from exports.

International Trade Restrictions

Governments use four sets of tools to influence international trade and protect domestic industries from foreign competition. They are

- Tariffs
- Import quotas
- Other import barriers
- Export subsidies

Tariffs

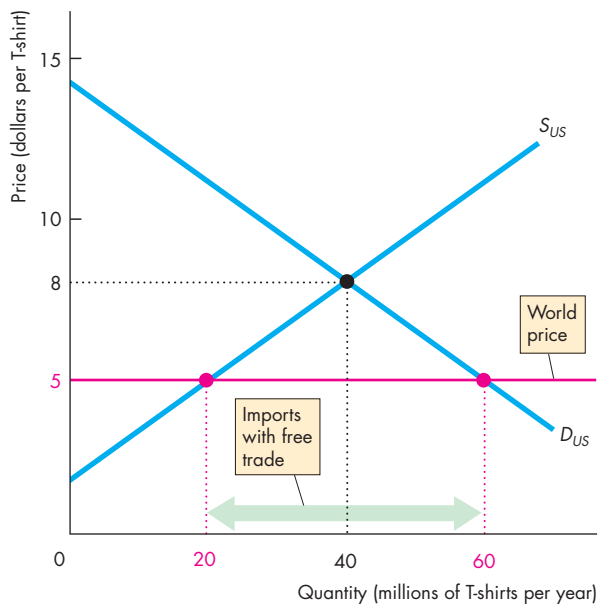
A **tariff** is a tax on a good that is imposed by the importing country when an imported good crosses its international boundary. For example, the government of India imposes a 100 percent tariff on wine imported from California. So when an Indian imports a \$10 bottle of Californian wine, he pays the Indian government a \$10 import duty.

Tariffs raise revenue for governments and serve the self-interest of people who earn their incomes in import-competing industries. But as you will see, restrictions on free international trade decrease the gains from trade and are not in the social interest.

The Effects of a Tariff To see the effects of a tariff, let's return to the example in which the United States imports T-shirts. With free trade, the T-shirts are imported and sold at the world price. Then, under pressure from U.S. garment makers, the U.S. government imposes a tariff on imported T-shirts. Buyers of T-shirts must now pay the world price plus the tariff. Several consequences follow and Fig. 7.5 illustrates them.

Figure 7.5(a) shows the situation with free international trade. The United States produces 20 million T-shirts a year and imports 40 million a year at the world price of \$5 a shirt. Figure 7.5(b) shows what happens with a tariff set at \$2 per T-shirt.

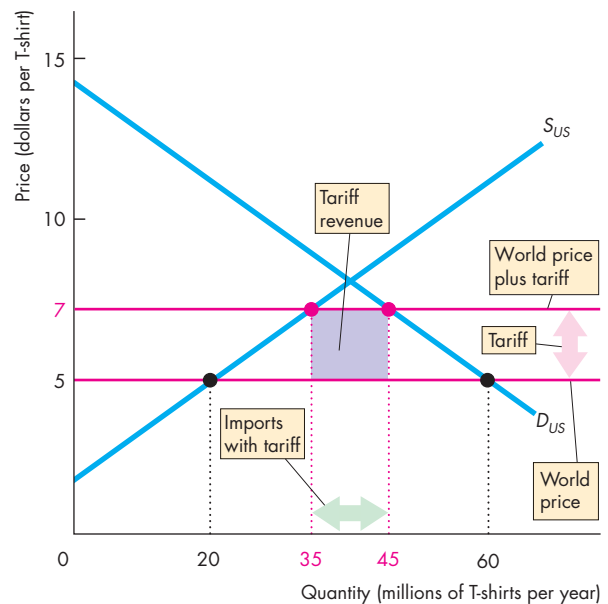
FIGURE 7.5 The Effects of a Tariff



(a) Free trade

The world price of a T-shirt is \$5. With free trade in part (a), Americans buy 60 million T-shirts a year. U.S. garment makers produce 20 million T-shirts a year and the United States imports 40 million a year.

With a tariff of \$2 per T-shirt in part (b), the price in



(b) Market with tariff

the U.S. market rises to \$7 a T-shirt. U.S. production increases, U.S. purchases decrease, and the quantity imported decreases. The U.S. government collects a tariff revenue of \$2 on each T-shirt imported, which is shown by the purple rectangle.

The following changes occur in the market for T-shirts:

- The price of a T-shirt in the United States rises by \$2.
- The quantity of T-shirts bought in the United States decreases.
- The quantity of T-shirts produced in the United States increases.
- The quantity of T-shirts imported into the United States decreases.
- The U.S. government collects a tariff revenue.

Rise in Price of a T-Shirt To buy a T-shirt, Americans must pay the world price plus the tariff, so the price of a T-shirt rises by the \$2 tariff to \$7. Figure 7.5(b) shows the new domestic price line, which lies \$2 above the world price line. The price rises by the full amount of the tariff. The buyer pays the entire tariff because supply from the rest of the world is perfectly elastic (see Chapter 6, p. 137).

Decrease in Purchases The higher price of a T-shirt brings a decrease in the quantity demanded along the demand curve. Figure 7.5(b) shows the decrease from 60 million T-shirts a year at \$5 a shirt to 45 million a year at \$7 a shirt.

Increase in Domestic Production The higher price of a T-shirt stimulates domestic production, and U.S. garment makers increase the quantity supplied along the

supply curve. Figure 7.5(b) shows the increase from 20 million T-shirts at \$5 a shirt to 35 million a year at \$7 a shirt.

Decrease in Imports T-shirt imports decrease by 30 million, from 40 million to 10 million a year. Both the decrease in purchases and the increase in domestic production contribute to this decrease in imports.

Tariff Revenue The government's tariff revenue is \$20 million—\$2 per shirt on 10 million imported shirts—shown by the purple rectangle.

Winners, Losers, and the Social Loss from a Tariff A tariff on an imported good creates winners and losers and a social loss. When the U.S. government imposes a tariff on an imported good,

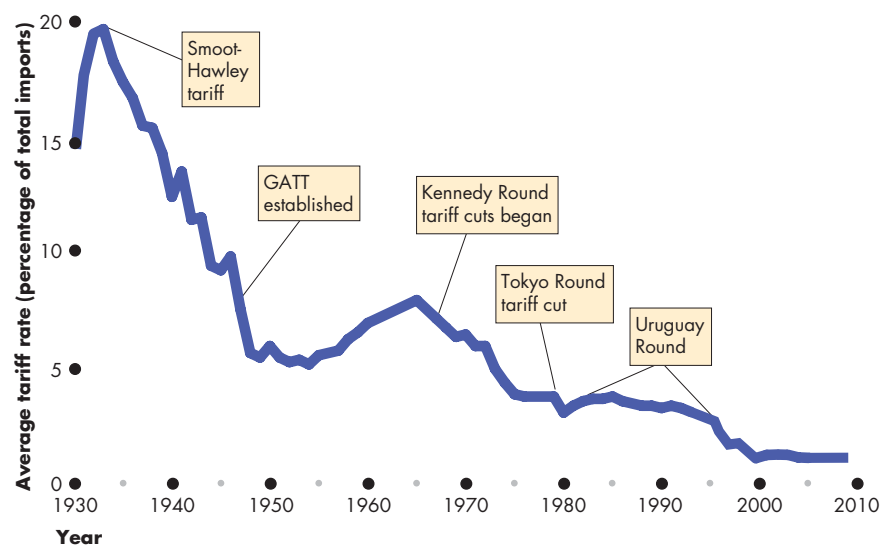
- U.S. consumers of the good lose.
- U.S. producers of the good gain.
- U.S. consumers lose more than U.S. producers gain.
- Society loses: a deadweight loss arises.

U.S. Consumers of the Good Lose Because the price of a T-shirt in the United States rises, the quantity of T-shirts demanded decreases. The combination of a higher price and smaller quantity bought decreases consumer surplus—the loss to U.S. consumers that arises from a tariff.

Economics in Action

U.S. Tariffs Almost Gone

The Smoot-Hawley Act, which was passed in 1930, took U.S. tariffs to a peak average rate of 20 percent in 1933. (One third of imports was subject to a 60 percent tariff.) The **General Agreement on Tariffs and Trade (GATT)** was established in 1947. Since then tariffs have fallen in a series of negotiating rounds, the most significant of which are identified in the figure. Tariffs are now as low as they have ever been but import quotas and other trade barriers persist.



Tariffs: 1930–2009

Sources of data: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970*, Bicentennial Edition, Part 1 (Washington, D.C., 1975); Series U-212; updated from *Statistical Abstract of the United States*: various editions.

U.S. Producers of the Good Gain Because the price of an imported T-shirt rises by the amount of the tariff, U.S. T-shirt producers are now able to sell their T-shirts for the world price plus the tariff. At the higher price, the quantity of T-shirts supplied by U.S. producers increases. The combination of a higher price and larger quantity produced increases producer surplus—the gain to U.S. producers from the tariff.

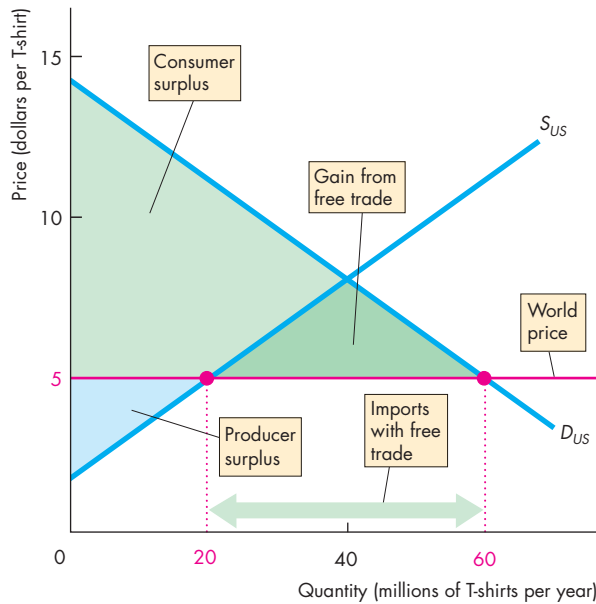
U.S. Consumers Lose More Than U.S. Producers Gain Consumer surplus decreases for four reasons: Some becomes producer surplus, some is lost in a higher cost of production (domestic producers have higher costs than foreign producers), some is lost because imports decrease, and some goes to the government as tariff revenue. Figure 7.6 shows these sources of lost consumer surplus.

Figure 7.6(a) shows the consumer surplus and producer surplus with free international trade in T-shirts. Figure 7.6(b) shows the consumer surplus and producer surplus with a \$2 tariff on imported T-shirts. By comparing Fig. 7.6(b) with Fig. 7.6(a), you can see how a tariff changes these surpluses.

Consumer surplus—the green area—shrinks for four reasons. First, the higher price transfers surplus from consumers to producers. The blue area *B* represents this loss (and gain of producer surplus). Second, domestic production costs more than imports. The supply curve S_{US} shows the higher cost of production and the gray area *C* shows this loss of consumer surplus. Third, some of the consumer surplus is transferred to the government. The purple area *D* shows this loss (and gain of government revenue). Fourth, some of the consumer surplus is lost because imports decrease. The gray area *E* shows this loss.

Society Loses: A Deadweight Loss Arises Some of the loss of consumer surplus is transferred to producers and some is transferred to the government and spent on government programs that people value. But the increase in production cost and the loss from decreased imports is transferred to no one: It is a social loss—a deadweight loss. The gray areas labeled *C* and *E* represent this deadweight loss. Total surplus decreases by the area $C + E$.

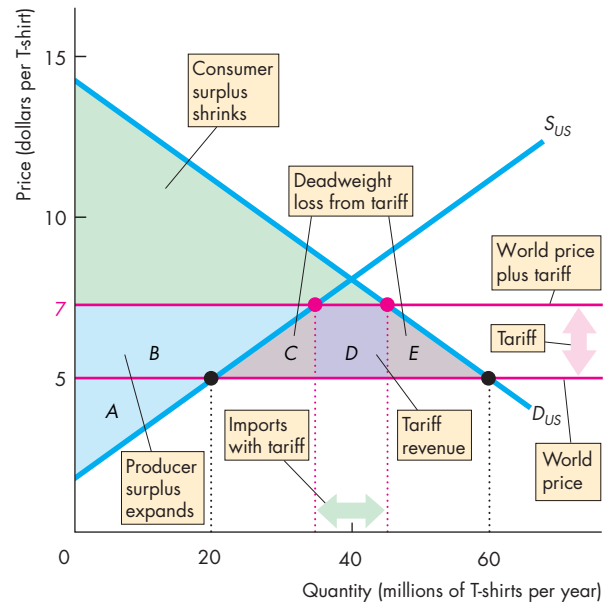
FIGURE 7.6 The Winners and Losers from a Tariff



(a) Free trade

The world price of a T-shirt is \$5. In part (a), with free trade, the United States imports 40 million T-shirts. Consumer surplus, producer surplus, and the gains from free trade are as large as possible.

In part (b), a tariff of \$2 per T-shirt raises the U.S. price



(b) Market with tariff

of a T-shirt to \$7. The quantity imported decreases. Consumer surplus shrinks by the areas *B*, *C*, *D*, and *E*. Producer surplus expands by area *B*. The government's tariff revenue is area *D*, and the tariff creates a deadweight loss equal to the area $C + E$.

Import Quotas

We now look at the second tool for restricting trade: import quotas. An **import quota** is a restriction that limits the maximum quantity of a good that may be imported in a given period.

Most countries impose import quotas on a wide range of items. The United States imposes them on food products such as sugar and bananas and manufactured goods such as textiles and paper.

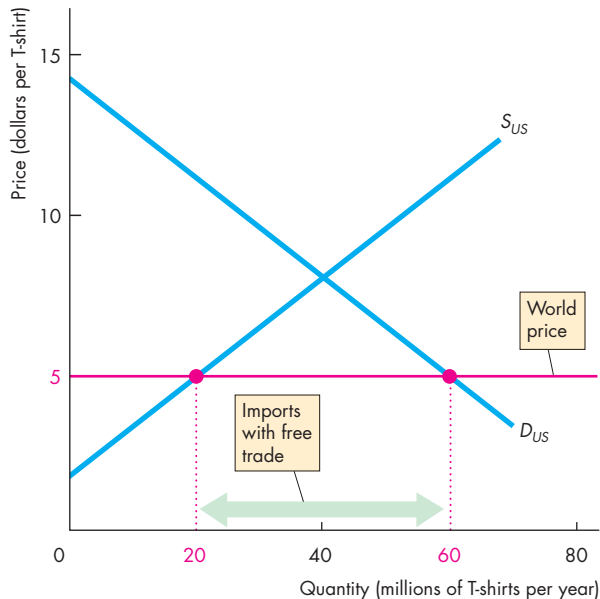
Import quotas enable the government to satisfy the self-interest of the people who earn their incomes in the import-competing industries. But you will discover that like a tariff, an import quota decreases the gains from trade and is not in the social interest.

The Effects of an Import Quota The effects of an import quota are similar to those of a tariff. The price rises, the quantity bought decreases, and the quantity produced in the United States increases. Figure 7.7 illustrates the effects.

Figure 7.7(a) shows the situation with free international trade. Figure 7.7(b) shows what happens with an import quota of 10 million T-shirts a year. The U.S. supply curve of T-shirts becomes the domestic supply curve, S_{US} , plus the quantity that the import quota permits. So the supply curve becomes $S_{US} + quota$. The price of a T-shirt rises to \$7, the quantity of T-shirts bought in the United States decreases to 45 million a year, the quantity of T-shirts produced in the United States increases to 35 million a year, and the quantity of T-shirts imported into the United States decreases to the quota quantity of 10 million a year. All the effects of this quota are identical to the effects of a \$2 per shirt tariff, as you can check in Fig. 7.5(b).

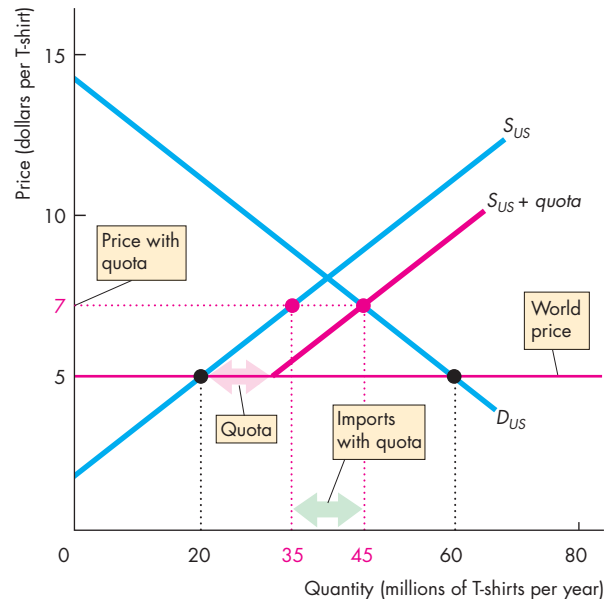
Winners, Losers, and the Social Loss from an Import Quota An import quota creates winners and losers that are similar to those of a tariff but with an interesting difference.

FIGURE 7.7 The Effects of an Import Quota



(a) Free trade

With free international trade, in part (a), Americans buy 60 million T-shirts at the world price. The United States produces 20 million T-shirts and imports 40 million a year. With an import quota of 10 million T-shirts a year, in part (b),



(b) Market with import quota

the supply of T-shirts in the United States is shown by the curve $S_{US} + quota$. The price in the United States rises to \$7 a T-shirt. U.S. production increases, U.S. purchases decrease, and the quantity of T-shirts imported decreases.

When the government imposes an import quota,

- U.S. consumers of the good lose.
- U.S. producers of the good gain.
- Importers of the good gain.
- Society loses: a deadweight loss arises.

Figure 7.8 shows these gains and losses from a quota. By comparing Fig. 7.8(b) with a quota and Fig. 7.8(a) with free trade, you can see how an import quota of 10 million T-shirts a year changes the consumer and producer surpluses.

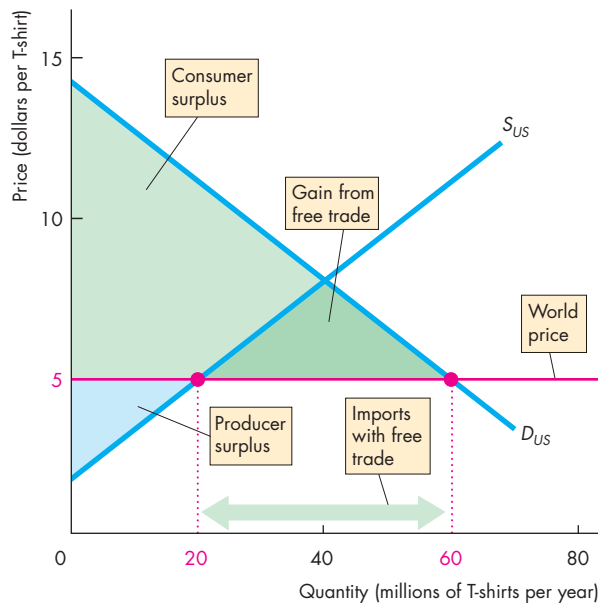
Consumer surplus—the green area—shrinks. This decrease is the loss to consumers from the import quota. The decrease in consumer surplus is made up of four parts. First, some of the consumer surplus is transferred to producers. The blue area *B* represents this loss of consumer surplus (and gain of producer surplus). Second, part of the consumer surplus is lost because the domestic cost of production is higher

than the world price. The gray area *C* represents this loss. Third, part of the consumer surplus is transferred to importers who buy T-shirts for \$5 (the world price) and sell them for \$7 (the U.S. domestic price). The two blue areas *D* represent this loss of consumer surplus and profit for importers. Fourth, part of the consumer surplus is lost because imports decrease. The gray area *E* represents this loss.

The losses of consumer surplus from the higher cost of production and the decrease in imports is a social loss—a deadweight loss. The gray areas labeled *C* and *E* represent this deadweight loss. Total surplus decreases by the area *C* + *E*.

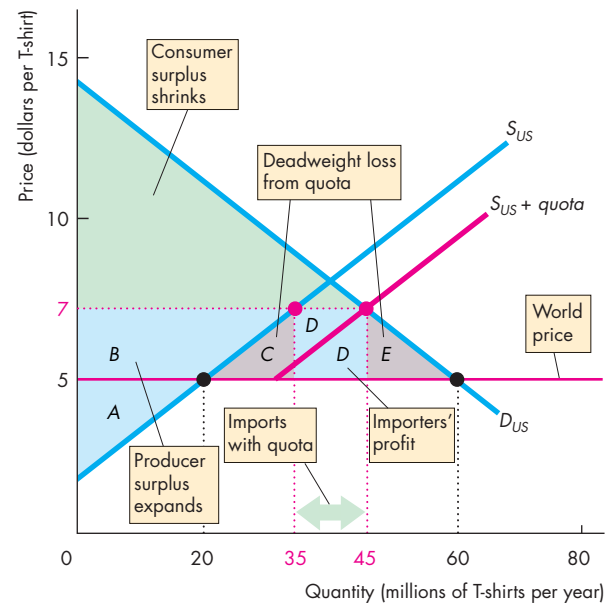
You can now see the one difference between a quota and a tariff. A tariff brings in revenue for the government while a quota brings a profit for the importers. All the other effects are the same, provided the quota is set at the same quantity of imports that results from the tariff.

FIGURE 7.8 The Winners and Losers from an Import Quota



(a) Free trade

The world price of a T-shirt is \$5. In part (a), with free trade, the United States produces 20 million T-shirts a year and imports 40 million T-shirts. Consumer surplus, producer surplus, and the gain from free international trade (darker green area) are as large as possible.



(b) Market with import quota

In part (b), the import quota raises the price of a T-shirt to \$7. The quantity imported decreases. Consumer surplus shrinks by the areas *B*, *C*, *D*, and *E*. Producer surplus expands by area *B*. Importers' profit is the two areas *D*, and the quota creates a deadweight loss equal to *C* + *E*.

Other Import Barriers

Two sets of policies that influence imports are

- Health, safety, and regulation barriers
- Voluntary export restraints

Health, Safety, and Regulation Barriers Thousands of detailed health, safety, and other regulations restrict international trade. For example, U.S. food imports are examined by the Food and Drug Administration to determine whether the food is “pure, wholesome, safe to eat, and produced under sanitary conditions.” The discovery of BSE (mad cow disease) in just one U.S. cow in 2003 was enough to close down international trade in U.S. beef. The European Union bans imports of most genetically modified foods, such as U.S.-produced soybeans. Although regulations of the type we’ve just described are not designed to limit international trade, they have that effect.

Voluntary Export Restraints A *voluntary export restraint* is like a quota allocated to a foreign exporter of a good. This type of trade barrier isn’t common. It was initially used during the 1980s when Japan voluntarily limited its exports of car parts to the United States.

Export Subsidies

A *subsidy* is a payment by the government to a producer. You studied the effects of a subsidy on the quantity produced and the price of a subsidized farm product in Chapter 6, pp. 140–141.

An *export subsidy* is a payment by the government to the producer of an exported good. Export subsidies are illegal under a number of international agreements, including the North American Free Trade Agreement (NAFTA), and the rules of the World Trade Organization (WTO).

Although export subsidies are illegal, the subsidies that the U.S. and European Union governments pay to farmers end up increasing domestic production, some of which gets exported. These exports of subsidized farm products make it harder for producers in other countries, notably in Africa and Central and South America, to compete in global markets. Export subsidies bring gains to domestic producers, but they result in inefficient underproduction in the rest of the world and create a deadweight loss.

Economics in Action

Self-Interest Beats the Social Interest

The **World Trade Organization (WTO)** is an international body established by the world’s major trading nations for the purpose of supervising international trade and lowering the barriers to trade.

In 2001, at a meeting of trade ministers from all the WTO member-countries held in Doha, Qatar, an agreement was made to begin negotiations to lower tariff barriers and quotas that restrict international trade in farm products and services. These negotiations are called the **Doha Development Agenda** or the **Doha Round**.

In the period since 2001, thousands of hours of conferences in Cancún in 2003, Geneva in 2004, and Hong Kong in 2005, and ongoing meetings at WTO headquarters in Geneva, costing millions of taxpayers’ dollars, have made disappointing progress.

Rich nations, led by the United States, the European Union, and Japan, want greater access to the markets of developing nations in exchange for allowing those nations greater access to the markets of the rich world, especially those for farm products.

Developing nations, led by Brazil, China, India, and South Africa, want access to the markets of farm products of the rich world, but they also want to protect their infant industries.

With two incompatible positions, these negotiations are stalled and show no signs of a breakthrough. The self-interests of rich nations and developing nations are preventing the achievement of the social interest.

REVIEW QUIZ

- 1 What are the tools that a country can use to restrict international trade?
- 2 Explain the effects of a tariff on domestic production, the quantity bought, and the price.
- 3 Explain who gains and who loses from a tariff and why the losses exceed the gains.
- 4 Explain the effects of an import quota on domestic production, consumption, and price.
- 5 Explain who gains and who loses from an import quota and why the losses exceed the gains.

You can work these questions in Study Plan 7.3 and get instant feedback.



The Case Against Protection

For as long as nations and international trade have existed, people have debated whether a country is better off with free international trade or with protection from foreign competition. The debate continues, but for most economists, a verdict has been delivered and is the one you have just seen. Free trade promotes prosperity for all countries; protection is inefficient. We've seen the most powerful case for free trade—it brings gains for consumers that exceed any losses incurred by producers, so there is a net gain for society.

But there is a broader range of issues in the free trade versus protection debate. Let's review these issues.

Two classical arguments for restricting international trade are

- The infant-industry argument
- The dumping argument

The Infant-Industry Argument

The **infant-industry argument** for protection is that it is necessary to protect a new industry to enable it to grow into a mature industry that can compete in world markets. The argument is based on the idea that comparative advantage changes or is dynamic and that on-the-job experience—*learning-by-doing*—is an important source of changes in comparative advantage. The fact that learning-by-doing can change comparative advantage doesn't justify protecting an infant industry.

First, the infant-industry argument is not valid if the benefits of learning-by-doing accrue *only* to the firms in the infant industry. The reason is that these firms will anticipate and reap the benefits of learning-by-doing without the additional incentive of protection from foreign competition.

For example, there are huge productivity gains from learning-by-doing in the manufacture of aircraft, but these gains benefit Boeing and other aircraft producers. Because the people making the decisions are the ones who benefit, they take the future gains into account when they decide on the scale of their activities. No benefits accrue to firms in other industries or other parts of the economy, so there is no need for government assistance to achieve an efficient outcome.

Second, even if the case is made for protecting an infant industry, it is more efficient to do so by giving the firms in the industry a subsidy, which is financed out of taxes. Such a subsidy would encourage the industry to mature and to compete with efficient world producers and keep the price faced by consumers at the world price.

The Dumping Argument

Dumping occurs when a foreign firm sells its exports at a lower price than its cost of production. Dumping might be used by a firm that wants to gain a global monopoly. In this case, the foreign firm sells its output at a price below its cost to drive domestic firms out of business. When the domestic firms have gone, the foreign firm takes advantage of its monopoly position and charges a higher price for its product. Dumping is illegal under the rules of the WTO and is usually regarded as a justification for temporary tariffs, which are called *countervailing duties*.

But there are powerful reasons to resist the dumping argument for protection. First, it is virtually impossible to detect dumping because it is hard to determine a firm's costs. As a result, the test for dumping is whether a firm's export price is below its domestic price. But this test is a weak one because it can be rational for a firm to charge a low price in a market in which the quantity demanded is highly sensitive to price and a higher price in a market in which demand is less price-sensitive.

Second, it is hard to think of a good that is produced by a *global* monopoly. So even if all the domestic firms in some industry were driven out of business, it would always be possible to find alternative foreign sources of supply and to buy the good at a price determined in a competitive market.

Third, if a good or service were a truly global monopoly, the best way of dealing with it would be by regulation—just as in the case of domestic monopolies (see Chapter 13, pp. 313–315). Such regulation would require international cooperation.

The two arguments for protection that we've just examined have an element of credibility. The counterarguments are in general stronger, however, so these arguments do not make the case for protection. But they are not the only arguments that you might encounter. There are many other new arguments against globalization and for protection.

The most common ones are that protection

- Saves jobs
- Allows us to compete with cheap foreign labor
- Penalizes lax environmental standards
- Prevents rich countries from exploiting developing countries

Saves Jobs

First, free trade does cost some jobs, but it also creates other jobs. It brings about a global rationalization of labor and allocates labor resources to their highest-valued activities. International trade in textiles has cost tens of thousands of jobs in the United States as textile mills and other factories closed. But tens of thousands of jobs have been created in other countries as textile mills opened. And tens of thousands of U.S. workers got better-paying jobs than as textile workers because U.S. export industries expanded and created new jobs. More jobs have been created than destroyed.

Although protection does save particular jobs, it does so at a high cost. For example, until 2005, U.S. textile jobs were protected by an international agreement called the Multifiber Arrangement. The U.S. International Trade Commission (ITC) has estimated that because of import quotas, 72,000 jobs existed in the textile industry that would otherwise have disappeared and that the annual clothing expenditure in the United States was \$15.9 billion (\$160 per family) higher than it would have been with free trade. Equivalently, the ITC estimated that each textile job saved cost \$221,000 a year.

Imports don't only destroy jobs. They create jobs for retailers that sell imported goods and for firms that service those goods. Imports also create jobs by creating income in the rest of the world, some of which is spent on U.S.-made goods and services.

Allows Us to Compete with Cheap Foreign Labor

With the removal of tariffs on trade between the United States and Mexico, people said we would hear a "giant sucking sound" as jobs rushed to Mexico. Let's see what's wrong with this view.

The labor cost of a unit of output equals the wage rate divided by labor productivity. For example, if a U.S. autoworker earns \$30 an hour and produces 15 units of output an hour, the average labor cost of a

unit of output is \$2. If a Mexican auto assembly worker earns \$3 an hour and produces 1 unit of output an hour, the average labor cost of a unit of output is \$3. Other things remaining the same, the higher a worker's productivity, the higher is the worker's wage rate. High-wage workers have high productivity; low-wage workers have low productivity.

Although high-wage U.S. workers are more productive, on average, than low-wage Mexican workers, there are differences across industries. U.S. labor is relatively more productive in some activities than in others. For example, the productivity of U.S. workers in producing movies, financial services, and customized computer chips is relatively higher than their productivity in the production of metals and some standardized machine parts. The activities in which U.S. workers are relatively more productive than their Mexican counterparts are those in which the United States has a *comparative advantage*. By engaging in free trade, increasing our production and exports of the goods and services in which we have a comparative advantage, and decreasing our production and increasing our imports of the goods and services in which our trading partners have a comparative advantage, we can make ourselves and the citizens of other countries better off.

Penalizes Lax Environmental Standards

Another argument for protection is that many poorer countries, such as China and Mexico, do not have the same environmental policies that we have and, because they are willing to pollute and we are not, we cannot compete with them without tariffs. So if poorer countries want free trade with the richer and "greener" countries, they must raise their environmental standards.

This argument for protection is weak. First, a poor country cannot afford to be as concerned about its environmental standard as a rich country can. Today, some of the worst pollution of air and water is found in China, Mexico, and the former communist countries of Eastern Europe. But only a few decades ago, London and Los Angeles topped the pollution league chart. The best hope for cleaner air in Beijing and Mexico City is rapid income growth. And free trade contributes to that growth. As incomes in developing countries grow, they will have the *means* to match their desires to improve their environment. Second, a poor country may have a comparative advantage at doing "dirty" work, which helps it to raise its income and at

the same time enables the global economy to achieve higher environmental standards than would otherwise be possible.

Prevents Rich Countries from Exploiting Developing Countries

Another argument for protection is that international trade must be restricted to prevent the people of the rich industrial world from exploiting the poorer people of the developing countries and forcing them to work for slave wages.

Child labor and near-slave labor are serious problems that are rightly condemned. But by trading with poor countries, we increase the demand for the goods that these countries produce and, more significantly, we increase the demand for their labor. When the demand for labor in developing countries increases, the wage rate also increases. So, rather than exploiting people in developing countries, trade can improve their opportunities and increase their incomes.

The arguments for protection that we've reviewed leave free-trade unscathed. But a new phenomenon is at work in our economy: *offshore outsourcing*. Surely we need protection from this new source of foreign competition. Let's investigate.

Offshore Outsourcing

Citibank, the Bank of America, Apple, Nike, Wal-Mart: What do these U.S. icons have in common? They all send jobs that could be done in America to China, India, Thailand, or even Canada—they are offshoring. What exactly is offshoring?

What Is Offshoring? A firm in the United States can obtain the goods and services that it sells in any of four ways:

1. Hire American labor and produce in America.
2. Hire foreign labor and produce in other countries.
3. Buy finished goods, components, or services from other firms in the United States.
4. Buy finished goods, components, or services from other firms in other countries.

Activities 3 and 4 are **outsourcing**, and activities 2 and 4 are **offshoring**. Activity 4 is **offshore outsourcing**. Notice that offshoring includes activities that take place inside U.S. firms. If a U.S. firm opens its own facilities in another country, then it is offshoring.

Offshoring has been going on for hundreds of years, but it expanded rapidly and became a source of concern during the 1990s as many U.S. firms moved information technology services and general office services such as finance, accounting, and human resources management overseas.

Why Did Offshoring of Services Boom During the 1990s? The gains from specialization and trade that you saw in the previous section must be large enough to make it worth incurring the costs of communication and transportation. If the cost of producing a T-shirt in China isn't lower than the cost of producing the T-shirt in the United States by more than the cost of transporting the shirt from China to America, then it is more efficient to produce shirts in the United States and avoid the transportation costs.

The same considerations apply to trade in services. If services are to be produced offshore, then the cost of delivering those services must be low enough to leave the buyer with an overall lower cost. Before the 1990s, the cost of communicating across large distances was too high to make the offshoring of business services efficient. But during the 1990s, when satellites, fiber-optic cables, and computers cut the cost of a phone call between America and India to less than a dollar an hour, a huge base of offshore resources became competitive with similar resources in the United States.

What Are the Benefits of Offshoring? Offshoring brings gains from trade identical to those of any other type of trade. We could easily change the names of the items traded from T-shirts and airplanes (the examples in the previous sections of this chapter) to banking services and call center services (or any other pair of services). An American bank might export banking services to Indian firms, and Indians might provide call center services to U.S. firms. This type of trade would benefit both Americans and Indians provided the United States has a comparative advantage in banking services and India has a comparative advantage in call center services.

Comparative advantages like these emerged during the 1990s. India has the world's largest educated English-speaking population and is located in a time zone half a day ahead of the U.S. east coast and midway between Asia and Europe, which facilitates 24/7 operations. When the cost of communicating with a worker in India was several dollars a minute, as it was

before the 1990s, tapping these vast resources was just too costly. But at today's cost of a long-distance telephone call or Internet connection, resources in India can be used to produce services in the United States at a lower cost than those services can be produced by using resources located in the United States. And with the incomes that Indians earn from exporting services, some of the services (and goods) that Indians buy are produced in the United States.

Why Is Offshoring a Concern? Despite the gain from specialization and trade that offshoring brings, many people believe that it also brings costs that eat up the gains. Why?

A major reason is that offshoring is taking jobs in services. The loss of manufacturing jobs to other countries has been going on for decades, but the U.S. service sector has always expanded by enough to create new jobs to replace the lost manufacturing jobs. Now that service jobs are also going overseas, the fear is that there will not be enough jobs for Americans. This fear is misplaced.

Some service jobs are going overseas, while others are expanding at home. The United States imports call center services, but it exports education, health care, legal, financial, and a host of other types of services. Jobs in these sectors are expanding and will continue to expand.

The exact number of jobs that have moved to lower-cost offshore locations is not known, and estimates vary. But even the highest estimate is a tiny number compared to the normal rate of job creation.

Winners and Losers Gains from trade do not bring gains for every single person. Americans, on average, gain from offshore outsourcing, but some people lose. The losers are those who have invested in the human capital to do a specific job that has now gone offshore.

Unemployment benefits provide short-term temporary relief for these displaced workers. But the long-term solution requires retraining and the acquisition of new skills.

Beyond providing short-term relief through unemployment benefits, there is a large role for government in the provision of education and training to enable the labor force of the twenty-first century to be capable of ongoing learning and rapid retooling to take on new jobs that today we can't foresee.

Schools, colleges, and universities will expand and get better at doing their jobs of producing a highly educated and flexible labor force.

Avoiding Trade Wars

We have reviewed the arguments commonly heard in favor of protection and the counterarguments against it. There is one counterargument to protection that is general and quite overwhelming: Protection invites retaliation and can trigger a trade war.

The best example of a trade war occurred during the Great Depression of the 1930s when the United States introduced the Smoot-Hawley tariff. Country after country retaliated with its own tariff, and in a short period, world trade had almost disappeared. The costs to all countries were large and led to a renewed international resolve to avoid such self-defeating moves in the future. The costs also led to the creation of GATT and are the impetus behind current attempts to liberalize trade.

Why Is International Trade Restricted?

Why, despite all the arguments against protection, is trade restricted? There are two key reasons:

- Tariff revenue
- Rent seeking

Tariff Revenue Government revenue is costly to collect. In developed countries such as the United States, a well-organized tax collection system is in place that can generate billions of dollars of income tax and sales tax revenues. This tax collection system is made possible by the fact that most economic transactions are done by firms that must keep properly audited financial records. Without such records, revenue collection agencies (the Internal Revenue Service in the United States) would be severely hampered in their work. Even with audited financial accounts, some potential tax revenue is lost. Nonetheless, for industrialized countries, the income tax and sales taxes are the major sources of revenue and tariffs play a very small role.

But governments in developing countries have a difficult time collecting taxes from their citizens. Much economic activity takes place in an informal economy with few financial records, so only a small amount of revenue is collected from income taxes and sales taxes. The one area in which economic transactions are well recorded and audited is international trade. So this activity is an attractive base for tax collection in these countries and is used much more extensively than it is in developed countries.

Rent Seeking Rent seeking is the major reason why international trade is restricted. **Rent seeking** is lobbying for special treatment by the government to create economic profit or to divert consumer surplus or producer surplus away from others. Free trade increases consumption possibilities *on average*, but not everyone shares in the gain and some people even lose. Free trade brings benefits to some and imposes costs on others, with total benefits exceeding total costs. The uneven distribution of costs and benefits is the principal obstacle to achieving more liberal international trade.

Returning to the example of trade in T-shirts and airplanes, the benefits from free trade accrue to all the producers of airplanes and to those producers of T-shirts that do not bear the costs of adjusting to a smaller garment industry. These costs are transition costs, not permanent costs. The costs of moving to free trade are borne by the garment producers and their employees who must become producers of other goods and services in which the United States has a comparative advantage.

The number of winners from free trade is large, but because the gains are spread thinly over a large number of people, the gain per person is small. The winners could organize and become a political force lobbying for free trade. But political activity is costly. It uses time and other scarce resources and the gains per person are too small to make the cost of political activity worth bearing.

In contrast, the number of losers from free trade is small, but the loss per person is large. Because the loss per person is large, the people who lose *are* willing to incur considerable expense to lobby against free trade.

Both the winners and losers weigh benefits and costs. Those who gain from free trade weigh the benefits it brings against the cost of achieving it. Those who lose from free trade and gain from protection weigh the benefit of protection against the cost of maintaining it. The protectionists undertake a larger quantity of political lobbying than the free traders.

Compensating Losers

If, in total, the gains from free international trade exceed the losses, why don't those who gain compensate those who lose so that everyone is in favor of free trade?

Some compensation does take place. When Congress approved the North American Free Trade

Agreement (NAFTA) with Canada and Mexico, it set up a \$56 million fund to support and retrain workers who lost their jobs as a result of the new trade agreement. During NAFTA's first six months, only 5,000 workers applied for benefits under this scheme. The losers from international trade are also compensated indirectly through the normal unemployment compensation arrangements. But only limited attempts are made to compensate those who lose.

The main reason why full compensation is not attempted is that the costs of identifying all the losers and estimating the value of their losses would be enormous. Also, it would never be clear whether a person who has fallen on hard times is suffering because of free trade or for other reasons that might be largely under her or his control. Furthermore, some people who look like losers at one point in time might, in fact, end up gaining. The young autoworker who loses his job in Michigan and becomes a computer assembly worker in Minneapolis might resent the loss of work and the need to move. But a year later, looking back on events, he counts himself fortunate.

Because we do not, in general, compensate the losers from free international trade, protectionism is a popular and permanent feature of our national economic and political life.



REVIEW QUIZ

- 1 What are the infant industry and dumping arguments for protection? Are they correct?
- 2 Can protection save jobs and the environment and prevent workers in developing countries from being exploited?
- 3 What is offshore outsourcing? Who benefits from it and who loses?
- 4 What are the main reasons for imposing a tariff?
- 5 Why don't the winners from free trade win the political argument?

You can work these questions in Study Plan 7.4 and get instant feedback.



◆ We end this chapter on global markets in action in *Reading Between the Lines* on pp. 168–169, where we apply what you've learned by looking at the effects of a U.S. tariff on imports of tires from China.

A Tariff on Tires

China: Tire Trade Penalties Will Hurt Relations with U.S.

USAToday

September 12, 2009

WASHINGTON—President Obama’s decision to impose trade penalties on Chinese tires has infuriated Beijing. ...

The federal trade panel recommended a 55% tariff in the first year, 45% in the second year, and 35% in the third year. Obama settled on 35% the first year, 30% in the second, and 25% in the third, [White House Press Secretary Robert] Gibbs said.

“For trade to work for everybody, it has to be based on fairness and rules. We’re simply enforcing those rules and would expect the Chinese to understand those rules,” Gibbs said.

...

The steelworkers union ... says more than 5,000 tire workers have lost jobs since 2004, as Chinese tires overwhelmed the U.S. market.

The U.S. trade representative’s office said four tire plants closed in 2006 and 2007 and three more are closing this year. During that time, just one new plant opened. U.S. imports of Chinese tires more than tripled from 2004 to 2008 and China’s market share in the United States went from 4.7% of tires purchased in 2004 to 16.7% in 2008, the office said. ...

China said the tariffs do not square with the facts, ... citing a 2.2% increase in 2008 from 2007, and a 16% fall in exports in the first half of 2009 compared with the first half of 2008.

The new tariffs, on top of an existing 4% tariff on all tire imports, take effect Sept. 26. ...

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ESSENCE OF THE STORY

- The United States is imposing a tariff on tires imported from China of 35 percent in 2009 and falling after two years to 25 percent.
- The steelworkers union says that more than 5,000 U.S. tire workers have lost jobs since 2004.
- Four U.S. tire plants closed in 2006 and 2007 and three were closing in 2009.
- Between 2004 and 2008, U.S. imports of Chinese tires more than tripled and China’s share of the U.S. tire market increased from 4.7 percent of tires purchased in 2004 to 16.7 percent in 2008.
- China said that the rate of increase in 2008 was 2.2 percent and in the first half of 2009 its tire exports to the United States fell by 16 percent compared with the first half of 2008.

ECONOMIC ANALYSIS

- In the global economy, 450 firms produce more than 1 billion tires a year.
- The United States produces tires and imports tires from other countries.
- In 2004, the wholesale price of a tire, on average, was \$40. The United States produced 235 million tires and imported 15 million.
- Figure 1 shows this situation. The demand curve is D_{US} and the supply curve is S_{US04} . The world price is \$40 a tire and the gap between the quantity demanded and quantity supplied was filled by tire imports.
- Between 2004 and 2008, the price of rubber, one of the main inputs into a tire, doubled. With this rise in the price of a resource used to produce tires, the supply of tires in the United States decreased and the supply curve shifted leftward to S_{US08} .
- Tire producers in China felt the same rise in the price of rubber, but by installing the latest technology machines and with low-cost labor, they were able to prevent the cost of producing a tire from rising. The world price didn't rise.
- The decrease in U.S. supply with no change in the world price brought a surge of tire imports, especially from China.
- U.S. tire producers scaled back production and fired workers. In Fig. 1, U.S. production fell to 200 million tires a year and tire imports rose to 50 million a year.
- In this situation, the United States imposed a 35 percent tariff on Chinese-made tires. Figure 2 illustrates. The world price plus tariff raised the wholesale price in the United States to \$55 a tire.
- U.S. supply is S_{US09} and at the higher price, U.S. firms increase the quantity of tires supplied to 215 million a year. The quantity demanded decreases to 240 million a year and U.S. imports shrink.
- The U.S. government collects tariff revenue (the purple rectangle) and a deadweight loss arises (the sum of the two gray triangles).

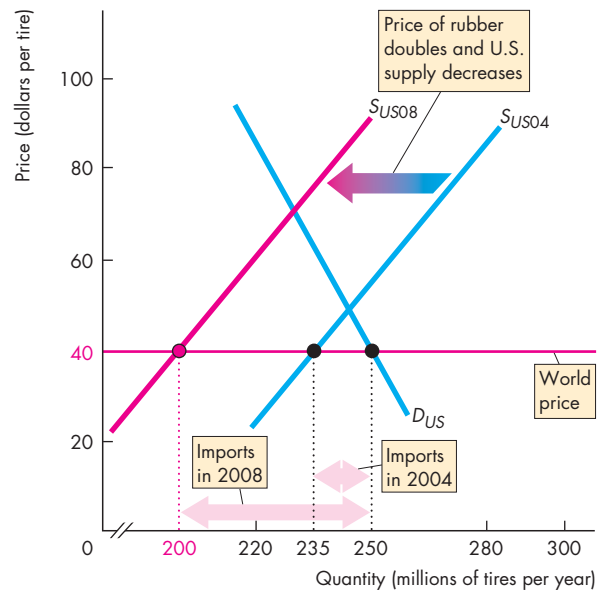


Figure 1 The surge in tire imports

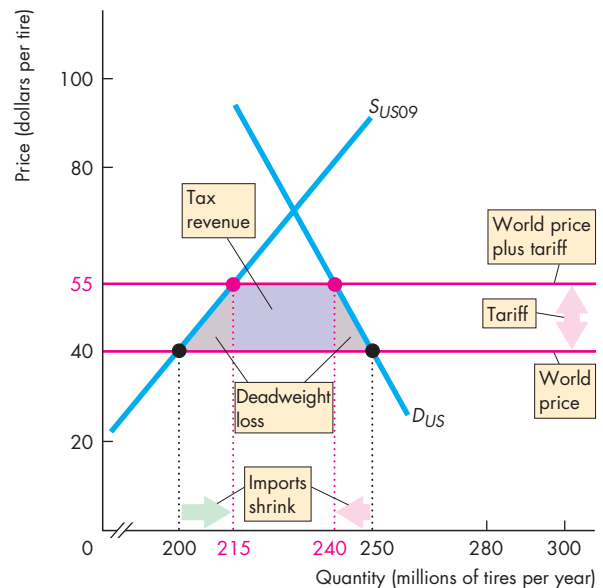


Figure 2 The effects of the tariff on tire imports

SUMMARY

Key Points

How Global Markets Work (pp. 152–154)

- Comparative advantage drives international trade.
- If the world price of a good is lower than the domestic price, the rest of the world has a comparative advantage in producing that good and the domestic country gains by producing less, consuming more, and importing the good.
- If the world price of a good is higher than the domestic price, the domestic country has a comparative advantage in producing that good and gains by producing more, consuming less, and exporting the good.

Working Problems 1 to 6 will give you a better understanding of how global markets work.

Winners, Losers, and the Net Gain from Trade

(pp. 155–156)

- Compared to a no-trade situation, in a market with imports, consumer surplus is larger, producer surplus is smaller, and total surplus is larger with free international trade.
- Compared to a no-trade situation, in a market with exports, consumer surplus is smaller, producer surplus is larger, and total surplus is larger with free international trade.

Working Problems 7 and 8 will give you a better understanding of winners, losers, and the net gains from trade.

International Trade Restrictions (pp. 157–162)

- Countries restrict international trade by imposing tariffs, import quotas, and other import barriers.
- Trade restrictions raise the domestic price of imported goods, lower the quantity imported, decrease consumer surplus, increase producer surplus, and create a deadweight loss.

Working Problems 9 to 20 will give you a better understanding of international trade restrictions.

The Case Against Protection (pp. 163–167)

- Arguments that protection is necessary for infant industries and to prevent dumping are weak.
- Arguments that protection saves jobs, allows us to compete with cheap foreign labor, is needed to penalize lax environmental standards, and prevents exploitation of developing countries are flawed.
- Offshore outsourcing is just a new way of reaping gains from trade and does not justify protection.
- Trade restrictions are popular because protection brings a small loss per person to a large number of people and a large gain per person to a small number of people. Those who gain have a stronger political voice than those who lose and it is too costly to identify and compensate losers.

Working Problem 21 will give you a better understanding of the case against protection.

Key Terms

Doha Development Agenda (Doha Round), 162
 Dumping, 163
 Exports, 152
 General Agreement on Tariffs and Trade (GATT), 159

Import quota, 160
 Imports, 152
 Infant-industry argument, 163
 Offshore outsourcing, 165
 Offshoring, 165
 Outsourcing, 165

Rent seeking, 167
 Tariff, 157
 World Trade Organization (WTO), 162



STUDY PLAN PROBLEMS AND APPLICATIONS



You can work Problems 1 to 21 in MyEconLab Chapter 7 Study Plan and get instant feedback.

How Global Markets Work (Study Plan 7.1)

Use the following information to work Problems 1 to 3.

Wholesalers of roses (the firms that supply your local flower shop with roses for Valentine's Day) buy and sell roses in containers that hold 120 stems. The table provides information about the wholesale market for roses in the United States. The demand schedule is the wholesalers' demand and the supply schedule is the U.S. rose growers' supply.

Price (dollars per container)	Quantity demanded (millions of containers per year)	Quantity supplied
100	15	0
125	12	2
150	9	4
175	6	6
200	3	8
225	0	10

Wholesalers can buy roses at auction in Aalsmeer, Holland, for \$125 per container.

- Without international trade, what would be the price of a container of roses and how many containers of roses a year would be bought and sold in the United States?
 - At the price in your answer to part (a), does the United States or the rest of the world have a comparative advantage in producing roses?
- If U.S. wholesalers buy roses at the lowest possible price, how many do they buy from U.S. growers and how many do they import?
- Draw a graph to illustrate the U.S. wholesale market for roses. Show the equilibrium in that market with no international trade and the equilibrium with free trade. Mark the quantity of roses produced in the United States, the quantity imported, and the total quantity bought.

Use the following news clip to work Problems 4 and 5.

Underwater Oil Discovery to Transform Brazil into a Major Exporter

A huge underwater oil field discovered late last year has the potential to transform Brazil into a sizable exporter. Fifty years ago, Petrobras was formed as a

trading company to import oil to support Brazil's growing economy. Two years ago, Brazil reached its long-sought goal of energy self-sufficiency.

Source: *International Herald Tribune*,
January 11, 2008

- Describe Brazil's comparative advantage in producing oil and explain why its comparative advantage has changed.
- Draw a graph to illustrate the Brazilian market for oil and explain why Brazil was an importer of oil until a few years ago.
 - Draw a graph to illustrate the Brazilian market for oil and explain why Brazil may become an exporter of oil in the near future.

6. Postcard: Bangalore. Hearts Set on Joining the Global Economy, Indian IT Workers are Brushing Up on Their Interpersonal Skills

The huge number of Indian workers staffing the world's tech firms and call centers possess cutting-edge technical knowledge, but their interpersonal and communication skills lag far behind. Enter Bangalore's finishing schools.

Source: *Time*, May 5, 2008

- What comparative advantages does this news clip identify?
- Using the information in this news clip, what services do you predict Bangalore (India) exports and what services do you predict it imports?

Winners, Losers, and the Net Gain from Trade

(Study Plan 7.2)

- In the news clip in Problem 6, who will gain and who will lose from the trade in services that the news clip predicts?
- Use the information on the U.S. wholesale market for roses in Problem 1 to
 - Explain who gains and who loses from free international trade in roses compared to a situation in which Americans buy only roses grown in the United States.
 - Draw a graph to illustrate the gains and losses from free trade.
 - Calculate the gain from international trade.

International Trade Restrictions (Study Plan 7.3)

Use the following news clip to work Problems 9 and 10.

Steel Tariffs Appear to Have Backfired on Bush

President Bush set aside his free-trade principles last year and imposed heavy tariffs on imported steel to help out struggling mills in Pennsylvania and West Virginia. Some economists say the tariffs may have cost more jobs than they saved, by driving up costs for automakers and other steel users.

Source: *The Washington Post*, September 19, 2003

9. a. Explain how a high tariff on steel imports can help domestic steel producers.
 - b. Explain how a high tariff on steel imports can harm steel users.
10. Draw a graph of the U.S. market for steel to show how a high tariff on steel imports
 - i. Helps U.S. steel producers.
 - ii. Harms U.S. steel users.
 - iii. Creates a deadweight loss.

Use the information on the U.S. wholesale market for roses in Problem 1 to work Problems 11 to 16.

11. If the United States puts a tariff of \$25 per container on imports of roses, what happens to the U.S. price of roses, the quantity of roses bought, the quantity produced in the United States, and the quantity imported?
12. Who gains and who loses from this tariff?
13. Draw a graph to illustrate the gains and losses from the tariff and on the graph identify the gains and losses, the tariff revenue, and the deadweight loss.
14. If the United States puts an import quota on roses of 5 million containers, what happens to the U.S. price of roses, the quantity of roses bought, the quantity produced in the United States, and the quantity imported?
15. Who gains and who loses from this quota?
16. Draw a graph to illustrate the gains and losses from the import quota and on the graph identify the gains and losses, the importers' profit, and the deadweight loss.

Use the following news clip to work Problems 17 and 18.

Car Sales Go Up as Prices Tumble

Car affordability in Australia is now at its best in 20 years, fueling a surge in sales as prices tumble. In 2000, Australia cut the tariff to 15 percent and on January 1, 2005, it cut the tariff to 10 percent.

Source: *Courier Mail*, February 26, 2005

17. Explain who gains and who loses from the lower tariff on imported cars.
18. Draw a graph to show how the price of a car, the quantity of cars bought, the quantity of cars produced in Australia, and the quantity of cars imported into Australia changed.

Use the following news clip to work Problems 19 and 20.

Why the World Can't Afford Food

As [food] stocks dwindled, some countries placed export restrictions on food to protect their own supplies. This in turn drove up prices, punishing countries—especially poor ones—that depend on imports for much of their food.

Time, May 19, 2008

19. a. What are the benefits to a country from importing food?
 - b. What costs might arise from relying on imported food?
20. If a country restricts food exports, what effect does this restriction have in that country on the price of food, the quantity of food it produces, the quantity of food it consumes, and the quantity of food it exports?

The Case Against Protection (Study Plan 7.4)**21. Chinese Tire Maker Rejects U.S. Charge of Defects**

U.S. regulators ordered the recall of more than 450,000 faulty tires. The Chinese producer of the tires disputed the allegations and hinted that the recall might be an effort by foreign competitors to hamper Chinese exports to the United States. Mounting scrutiny of Chinese-made goods has become a source of new trade frictions between the United States and China and fueled worries among regulators, corporations, and consumers about the risks associated with many products imported from China.

Source: *International Herald Tribune*, June 26, 2007

- a. What does the information in the news clip imply about the comparative advantage of producing tires in the United States and China?
- b. Could product quality be a valid argument against free trade?
- c. How would the product-quality argument against free trade be open to abuse by domestic producers of the imported good?



ADDITIONAL PROBLEMS AND APPLICATIONS



These problems can be worked in MyEconLab if assigned by your instructor.

How Global Markets Work

22. Suppose that the world price of sugar is 10 cents a pound, the United States does not trade internationally, and the equilibrium price of sugar in the United States is 20 cents a pound. The United States then begins to trade internationally.
- How does the price of sugar in the United States change?
 - Do U.S. consumers buy more or less sugar?
 - Do U.S. sugar growers produce more or less sugar?
 - Does the United States export or import sugar and why?
23. Suppose that the world price of steel is \$100 a ton, India does not trade internationally, and the equilibrium price of steel in India is \$60 a ton. India then begins to trade internationally.
- How does the price of steel in India change?
 - How does the quantity of steel produced in India change?
 - How does the quantity of steel bought by India change?
 - Does India export or import steel and why?
24. A semiconductor is a key component in your laptop, cell phone, and iPod. The table provides information about the market for semiconductors in the United States.

Price (dollars per unit)	Quantity demanded (billions of units per year)	Quantity supplied
10	25	0
12	20	20
14	15	40
16	10	60
18	5	80
20	0	100

Producers of semiconductors can get \$18 a unit on the world market.

- With no international trade, what would be the price of a semiconductor and how many semiconductors a year would be bought and sold in the United States?
 - Does the United States have a comparative advantage in producing semiconductors?
25. **Act Now, Eat Later**
The hunger crisis in poor countries has its roots in U.S. and European policies of subsidizing the diversion of food crops to produce biofuels like corn-based ethanol. That is, doling out subsidies to put the world's dinner into the gas tank.
Source: *Time*, May 5, 2008
- What is the effect on the world price of corn of the increased use of corn to produce ethanol in the United States and Europe?
 - How does the change in the world price of corn affect the quantity of corn produced in a poor developing country with a comparative advantage in producing corn, the quantity it consumes, and the quantity that it either exports or imports?
- Winners, Losers, and the Net Gain from Trade**
26. Use the news clip in Problem 25. Draw a graph of the market for corn in a poor developing country to show the changes in consumer surplus, producer surplus, and deadweight loss. Use the following news clip to work Problems 27 and 28.
- South Korea to Resume U.S. Beef Imports**
South Korea will reopen its market to most U.S. beef. South Korea banned imports of U.S. beef in 2003 amid concerns over a case of mad cow disease in the United States. The ban closed what was then the third-largest market for U.S. beef exporters.
Source: CNN, May 29, 2008
- Explain how South Korea's import ban on U.S. beef affected beef producers and consumers in South Korea.
 - Draw a graph of the market for beef in South Korea to illustrate your answer to part (a). Identify the changes in consumer surplus, producer surplus, and deadweight loss.
28. a. Assuming that South Korea is the only importer of U.S. beef, explain how South Korea's import ban on U.S. beef affected beef producers and consumers in the United States.
- Draw a graph of the market for beef in the United States to illustrate your answer to part (a). Identify the changes in consumer surplus, producer surplus, and deadweight loss.

International Trade Restrictions

Use the following information to work Problems 29 to 31.

Before 1995, trade between the United States and Mexico was subject to tariffs. In 1995, Mexico joined NAFTA and all U.S. and Mexican tariffs have gradually been removed.

29. Explain how the price that U.S. consumers pay for goods from Mexico and the quantity of U.S. imports from Mexico have changed. Who are the winners and who are the losers from this free trade?
30. Explain how the quantity of U.S. exports to Mexico and the U.S. government's tariff revenue from trade with Mexico have changed.
31. Suppose that in 2008, tomato growers in Florida lobby the U.S. government to impose an import quota on Mexican tomatoes. Explain who in the United States would gain and who would lose from such a quota.

Use the following information to work Problems 32 and 33.

Suppose that in response to huge job losses in the U.S. textile industry, Congress imposes a 100 percent tariff on imports of textiles from China.

32. Explain how the tariff on textiles will change the price that U.S. buyers pay for textiles, the quantity of textiles imported, and the quantity of textiles produced in the United States.
33. Explain how the U.S. and Chinese gains from trade will change. Who in the United States will lose and who will gain?

Use the following information to work Problems 34 and 35.

With free trade between Australia and the United States, Australia would export beef to the United States. But the United States imposes an import quota on Australian beef.

34. Explain how this quota influences the price that U.S. consumers pay for beef, the quantity of beef produced in the United States, and the U.S. and the Australian gains from trade.
35. Explain who in the United States gains from the quota on beef imports and who loses.

The Case Against Protection

36. Trading Up

The cost of protecting jobs in uncompetitive sectors through tariffs is high: Saving a job in the

sugar industry costs American consumers \$826,000 in higher prices a year; saving a dairy industry job costs \$685,000 per year; and saving a job in the manufacturing of women's handbags costs \$263,000.

Source: *The New York Times*, June 26, 2006

- a. What are the arguments for saving the jobs mentioned in this news clip?
- b. Explain why these arguments are faulty.
- c. Is there any merit to saving these jobs?

Economics in the News

37. After you have studied *Reading Between the Lines* on pp. 168–169, answer the following questions.
 - a. What events put U.S. tire producers under pressure and caused some to go out of business?
 - b. Explain how a tariff on tire imports changes domestic production, consumption, and imports of tires.
 - c. Illustrate your answer to part (b) with an appropriate graphical analysis.
 - d. Explain how a tariff on tire imports changes consumer surplus and producer surplus.
 - e. Explain the four sources of loss of consumer surplus that result from a tariff on tire imports.
 - f. Illustrate your answer to part (e) with an appropriate graphical analysis.

38. Aid May Grow for Laid-Off Workers

Expansion of the Trade Adjustment Assistance (TAA) program would improve the social safety net for the 21st century, as advances permit more industries to take advantage of cheap foreign labor—even for skilled, white-collar work. By providing special compensation to more of globalization's losers and retraining them for stable jobs at home, an expanded program could begin to ease the resentment and insecurity arising from the new economy.

Source: *The Washington Post*, July 23, 2007

- a. Why does the United States engage in international trade if it causes U.S. workers to lose their jobs?
- b. Explain how an expansion of the TAA program will make it easier for the United States to move toward freer international trade.

The Amazing Market

PART TWO

UNDERSTANDING HOW MARKETS WORK

The five chapters that you've just studied explain how markets work. The market is an amazing instrument. It enables people who have never met and who know nothing about each other to interact and do business. It also enables us to allocate our scarce resources to the uses that we value most highly. Markets can be very simple or highly organized. Markets are ancient and they are modern.

A simple and ancient market is one that the American historian Daniel J. Boorstin describes in *The Discoverers* (p. 161). In the late fourteenth century,

The Muslim caravans that went southward from Morocco across the Atlas Mountains arrived after twenty days at the shores of the Senegal River. There the Moroccan traders laid out separate piles of salt, of beads from Ceutan coral, and cheap manufactured goods. Then they retreated out of sight. The local tribesmen, who lived in the strip mines where they dug their gold, came to the shore and put a heap of gold beside each pile of Moroccan goods. Then they, in turn, went out of view, leaving the Moroccan traders either to take the gold offered for a particular pile or to reduce the pile of their merchandise to suit the offered price in gold. Once again the Moroccan traders withdrew, and the process went on. By this system of commercial etiquette, the Moroccans collected their gold.

An organized and modern market is an auction at which the U.S. government sells rights to cell phone companies for the use of the airwaves.

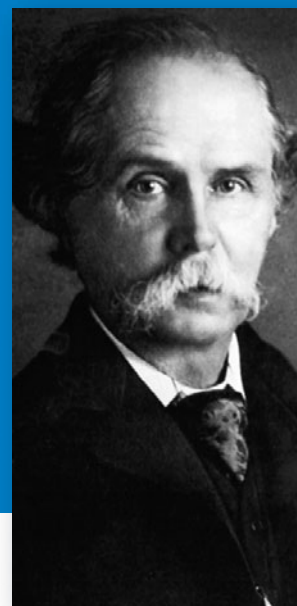
Everything and anything that can be exchanged is traded in markets to the benefit of both buyers and sellers.

Alfred Marshall (1842–1924) grew up in an England that was being transformed by the railroad and by the expansion of manufacturing. Mary Paley was one of Marshall's students at Cambridge, and when Alfred and Mary married, in 1877, celibacy rules barred Alfred from continuing to teach at Cambridge. By 1884, with more liberal rules, the Marshalls returned to Cambridge, where Alfred became Professor of Political Economy.

Many economists had a hand in refining the demand and supply model, but the first thorough and complete statement of the model as we know it today was set out by Alfred Marshall, with the help of Mary Paley Marshall. Published in 1890, this monumental treatise, *The Principles of Economics*, became the textbook on economics on both sides of the Atlantic for almost half a century.

"The forces to be dealt with are ... so numerous, that it is best to take a few at a time Thus we begin by isolating the primary relations of supply, demand, and price."

ALFRED MARSHALL
The Principles of Economics



What sparked your interest in economics?

I was studying mathematics and computer science, but I felt that the subjects were not as relevant as I would like.

I discovered economics through a research assistantship with a professor who was working on auctions. I had a summer job working for a firm that sold computers to the government through auctions. Eventually my professor, Bob Marshall, wrote two articles on the topic and testified before Congress to help reform the system for government procurement of computers. That really inspired me and showed me the power of economic ideas to change the world and to make things work more efficiently.

This original inspiration has remained and continues to drive much of your research. Can you explain how economists study auctions?

The study of the design of markets and auction-based marketplaces requires you to use all of the different tools that economics offers.

An auction is a well-defined game. You can write down the rules of the game and a formal theoretical model does a great job capturing the real problem that the players face. And theories do an excellent job predicting behavior.

Buyers have a valuation for an object that is private information. They do not know the valuations of other bidders, and sometimes they don't even know their own valuation. For example, if they're buying oil rights, there may be uncertainty about how much oil there is in the ground. In that case, information about the amount of oil available is dispersed among the bidders, because each bidder has done their own survey. The bidders face a strategic problem of bidding, and they face an informational problem of trying to draw inferences about how valuable the object will be if they win.

Bidders need to recognize that their bid only matters when they win the auction, and they only win when they bid the most. The knowledge that they were the most optimistic of all the competitors should cause them to revise their beliefs.

From the seller's perspective, there are choices about how an auction is designed—auctions can use sealed bidding, where the seller receives bids and then opens them at a pre-determined time, or alternatively bidding may be interactive, where each bidder has an



opportunity to outbid the previous high bidder. There are also different ways to use bids received by the auctioneer to determine the price. Create a new screamer: Both revenue and efficiency are affected by auction design. The seller may consider revenue, though governments are often most concerned about efficient allocation.

Both revenue and efficiency are affected by auction design. One key question the seller must consider is how the design will affect the participation of bidders, as this will determine how competitive bidding will be as well as whether the object gets to the potential bidder who values the item the most.

What must the designer of an auction-based marketplace take into account?

An example of an auction-based marketplace is eBay, where the market designer sets the rules for buyers and sellers to interact.

When you design an auction-based marketplace, you have a whole new set of concerns. The buyers and sellers themselves are independent agents, each

SUSAN ATHEY is Professor of Economics at Harvard University. Born in 1970 in Boston and growing up in Rockville, Maryland, she completed high school in three years, wrapped up three majors—in economics, mathematics, and computer science—at Duke University at 20, completed her Ph.D. at Stanford University at 24, and was voted tenure at MIT and Stanford at 29. After teaching at MIT for six years and Stanford for five years, she moved to Harvard in 2006. Among her many honors and awards, the most prestigious is the John Bates Clark Medal given to the best economist under 40. She is the first woman to receive this award.

Professor Athey's research is broad both in scope and style. A government that wants to auction natural resources will turn to her fundamental discoveries (and possibly consult with her) before deciding how to organize the auction. An economist who wants to test a theory using a large data set will use her work on statistics and econometrics.

Michael Parkin talked with Susan Athey about her research, the progress that economists have made in understanding and designing markets, and her advice to students.

acting in their own interest. The design is a two-step process: you need to design an auction that is going to achieve an efficient allocation; and you need to design both the auction and the overall structure of the marketplace to attract participation.

In the case of eBay, the platform itself chooses the possible auction formats: auctions take place over time and bidders have the opportunity to outbid the standing high bidder during that time. The platform also allows sellers to use the “buy it now” option. The platform also makes certain tools and services available, such as the ability to search for items in various ways, track auctions, provide feedback, and monitor reputation. The sellers can select the level of the reserve price, whether they want to have a secret reserve price, how long the auction will last, whether to use “buy it now,” what time of day the auction closes, how much information to provide, how many pictures they post.

These are all factors that impact participation of bidders and the revenue the seller will receive. The success of the platform hinges on both buyers and sellers choosing to participate.

Does auction theory enable us to predict the differences in the outcomes of an open ascending-bid English auction and a sealed-bid auction?

Sure. In some of my research, I compared open ascending auctions and pay-your-bid, sealed-bid auctions. I showed how the choice of auction format can make a big difference when you have small bidders bidding against larger, stronger bidders who usually (but not always) have higher valuations.

In an open ascending auction, it is hard for a small weaker bidder to

ever win, because a stronger bidder can see their bids, respond to them, and outbid them.

But in a pay-your-bid, sealed-bid auction, bidders shade their bids—they bid less than their value, assuring themselves of some profit if they win—and a large bidder doesn't have the opportunity to see and respond to an unusually high bid from a weak bidder. Strong bidders realize that their competition is weak, and they shade their bids a lot—they bid a lot less than their value. That gives a small bidder the opportunity to be aggressive and outbid a larger bidder, even if it has a lower value. So what that does is encourage entry of small bidders. I found empirically that this entry effect was important and it helps sealed-bid auctions generate larger revenue than open ascending-bid auctions.

Sealed-bid auctions can do a better job of deterring collusion ... and generate larger revenue

Does a sealed-bid auction always generate more revenue, other things equal, than an open ascending-bid auction?

Only if you have asymmetric bidders—strong large bidders and weaker small bidders—and even then the effect is ambiguous. It's an empirical question, but it tends to be true. We also showed that sealed-bid auctions can do a better job of deterring collusion. There are theoretical reasons to suggest that sealed bid auctions are more difficult to collude at than open ascending auctions, since at open ascending auctions, bidders can detect an opponent who is bidding higher than an agreement specifies and then respond to that. We found empirically in U.S. Forest Service timber auctions that the gap between sealed-bid auctions and ascending auctions was even greater than what a competitive model would predict, suggesting that some collusion may be at work.

What is the connection between auctions and the supply and demand model?

The basic laws of supply and demand can be seen in evidence in a market like eBay. The more sellers that are selling similar products, the lower the prices they can expect to achieve. Similarly the more buyers there are demanding those objects, the higher the prices the sellers can achieve.

An important thing for an auction marketplace is to attract a good balance of buyers and sellers so that both the buyers and the sellers find it more profitable

The basic laws of supply and demand can be seen in evidence in a market like eBay.

to transact in that marketplace rather than using some other mechanism. From a seller's perspective, the more bidders there are on the platform, the

greater the demand and the higher the prices. And from the buyer's perspective, the more sellers there are on the platform, the greater the supply and the lower the prices.

Can we think of this thought experiment you just described as discovering demand and supply curves?

Exactly. When you study supply and demand curves, you wave your hands about how the prices actually get set. In different kinds of market settings, the actual mechanisms for setting prices are different. One way of setting prices is through auctions. But we tend to use auctions in settings where there are unique objects, so there isn't just one market price for the thing you are selling. If you were selling something that had lots of market substitutes, you can think of there being a market price in which this object can transact. An auction is a way to find a market price for something where there might not be a fixed market.

Can we think of an auction as a mechanism for finding the equilibrium price and quantity?

Exactly. We can think of the whole collection of auctions on eBay as being a mechanism to discover a market clearing price, and individual items might sell

a little higher or a little lower but over all we believe that the prices on eBay auctions will represent market-clearing (equilibrium) prices.

Is economics a good subject in which to major? What subjects work well as complements with economics?

Of course I think economics is a fabulous major and I am passionate about it. I think it's a discipline that trains you to think rigorously. And if you apply yourself you'll finish an economics major with a more disciplined mind than when you started. Whether you go into the business world or academics, you'll be able to confront and think in a logical and structured way about whether a policy makes sense, a business model makes sense, or an industry structure is likely to be sustainable. You should look for that in an undergraduate major. You should not be looking to just absorb facts, but you should be looking to train your mind and to think in a way that you will be able to apply to the rest of your career. I think that economics combines well with statistics and mathematics or with more policy-oriented disciplines.

Do you have anything special to say to women who might be making a career choice? Why is economics a good field for a woman?

On the academic side, economics is a fairly objective field, where the best ideas win, so it's a level playing field. Academics is not very family friendly before you get tenured and extremely family friendly after. Within academics or outside of it, there are a wide range of fairly high-paying jobs that still allow some autonomy over your schedule and that have a deeper and more compelling meaning. For both men and women, if you choose to have a family, you reevaluate your career choices, and the tradeoff between time and money changes. And you're more likely to stick with and excel in a career if you find some meaning in it. So economics combines some of the advantages of having a strong job market and opportunities to have a large enough salary to pay for child care, and makes it economically worthwhile to stay in the workforce, without sacrificing the sense of the greater good.