CHAPTER

9

Application: International Trade

If you check the labels on the clothes you are wearing, you will probably find that some were made in another country. A century ago, the textile and clothing industry was a major part of the U.S. economy, but that is no longer the case. Faced with foreign competitors that can produce quality goods at low cost, many U.S. firms have found it increasingly difficult to produce and sell textiles and clothing at a profit. As a result, they have laid off their workers and shut down their factories. Today, most of the textiles and clothing that Americans consume are imported.

The story of the textile industry raises important questions for economic policy: How does international trade affect economic well-being? Who gains and who loses from free trade among countries, and how do the gains compare to the losses?

Chapter 3 introduced the study of international trade by applying the principle of comparative advantage. According to this principle, all countries

can benefit from trading with one another because trade allows each country to specialize in doing what it does best. But the analysis in Chapter 3 was incomplete. It did not explain how the international marketplace achieves these gains from trade or how the gains are distributed among various economic participants.

We now return to the study of international trade and take up these questions. Over the past several chapters, we have developed many tools for analyzing how markets work: supply, demand, equilibrium, consumer surplus, producer surplus, and so on. With these tools, we can learn more about how international trade affects economic well-being.

9-1 The Determinants of Trade

Consider the market for textiles. The textile market is well suited to studying the gains and losses from international trade: Textiles are made in many countries around the world, and there is much world trade in textiles. Moreover, the textile market is one in which policymakers often consider (and sometimes implement) trade restrictions to protect domestic producers from foreign competitors. We examine here the textile market in the imaginary country of Isoland.

9-1a The Equilibrium without Trade

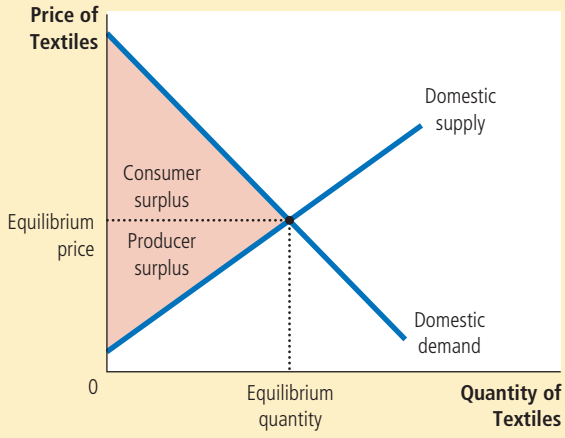
As our story begins, the Isolandian textile market is isolated from the rest of the world. By government decree, no one in Isoland is allowed to import or export textiles, and the penalty for violating the decree is so large that no one dares try.

Because there is no international trade, the market for textiles in Isoland consists solely of Isolandian buyers and sellers. As Figure 1 shows, the domestic price adjusts to balance the quantity supplied by domestic sellers and the quantity demanded by domestic buyers. The figure shows the consumer and producer surplus in the equilibrium without trade. The sum of consumer and producer surplus measures the total benefits that buyers and sellers receive from participating in the textile market.

FIGURE 1

The Equilibrium without International Trade

When an economy cannot trade in world markets, the price adjusts to balance domestic supply and demand. This figure shows consumer and producer surplus in an equilibrium without international trade for the textile market in the imaginary country of Isoland.



Now suppose that, in a political upset, Isoland elects a new president. The president campaigned on a platform of "change" and promised the voters bold new ideas. Her first act is to assemble a team of economists to evaluate Isolandian trade policy. She asks them to report on three questions:

- If the government allows Isolandians to import and export textiles, what will happen to the price of textiles and the quantity of textiles sold in the domestic textile market?
- Who will gain from free trade in textiles and who will lose, and will the gains exceed the losses?
- Should a tariff (a tax on textile imports) be part of the new trade policy?

After reviewing supply and demand in their favorite textbook (this one, of course), the Isolandian economics team begins its analysis.

9-1b The World Price and Comparative Advantage

The first issue our economists take up is whether Isoland is likely to become a textile importer or a textile exporter. In other words, if free trade is allowed, will Isolandians end up buying or selling textiles in world markets?

To answer this question, the economists compare the current Isolandian price of textiles to the price of textiles in other countries. We call the price prevailing in world markets the **world price**. If the world price of textiles is higher than the domestic price, then Isoland will export textiles once trade is permitted. Isolandian textile producers will be eager to receive the higher prices available abroad and will start selling their textiles to buyers in other countries. Conversely, if the world price of textiles is lower than the domestic price, then Isoland will import textiles. Because foreign sellers offer a better price, Isolandian textile consumers will quickly start buying textiles from other countries.

world price
the price of a good that prevails in the world market for that good

In essence, comparing the world price and the domestic price before trade indicates whether Isoland has a comparative advantage in producing textiles. The domestic price reflects the opportunity cost of textiles: It tells us how much an Isolandian must give up to obtain one unit of textiles. If the domestic price is low, the cost of producing textiles in Isoland is low, suggesting that Isoland has a comparative advantage in producing textiles relative to the rest of the world. If the domestic price is high, then the cost of producing textiles in Isoland is high, suggesting that foreign countries have a comparative advantage in producing textiles.

As we saw in Chapter 3, trade among nations is ultimately based on comparative advantage. That is, trade is beneficial because it allows each nation to specialize in doing what it does best. By comparing the world price and the domestic price before trade, we can determine whether Isoland is better or worse at producing textiles than the rest of the world.

Quick Quiz *The country Autarka does not allow international trade. In Autarka, you can buy a wool suit for 3 ounces of gold. Meanwhile, in neighboring countries, you can buy the same suit for 2 ounces of gold. If Autarka were to allow free trade, would it import or export wool suits? Why?*

9-2 The Winners and Losers from Trade

To analyze the welfare effects of free trade, the Isolandian economists begin with the assumption that Isoland is a small economy compared to the rest of the world. This small-economy assumption means that Isoland's actions have little effect on world markets. Specifically, any change in Isoland's trade policy will not affect the world price of textiles. The Isolandians are said to be *price takers* in the world economy. That is, they take the world price of textiles as given. Isoland can be an exporting country by selling textiles at this price or an importing country by buying textiles at this price.

The small-economy assumption is not necessary to analyze the gains and losses from international trade. But the Isolandian economists know from experience (and from reading Chapter 2 of this book) that making simplifying assumptions is a key part of building a useful economic model. The assumption that Isoland is a small economy simplifies the analysis, and the basic lessons do not change in the more complicated case of a large economy.

9-2a The Gains and Losses of an Exporting Country

Figure 2 shows the Isolandian textile market when the domestic equilibrium price before trade is below the world price. Once trade is allowed, the domestic price rises to equal the world price. No seller of textiles would accept less than the world price, and no buyer would pay more than the world price.

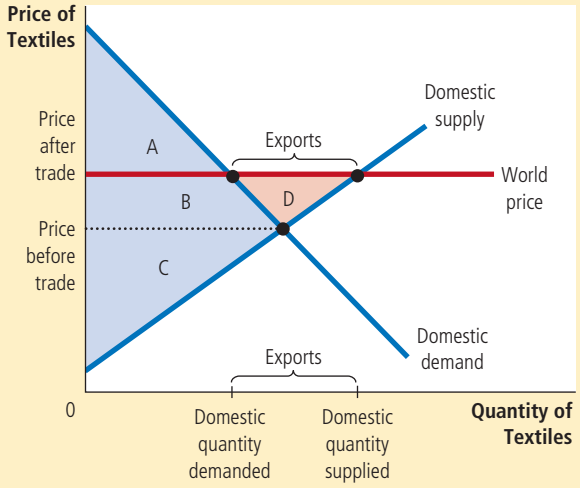
FIGURE 2

International Trade in an Exporting Country

Once trade is allowed, the domestic price rises to equal the world price. The supply curve shows the quantity of textiles produced domestically, and the demand curve shows the quantity consumed domestically. Exports from Isoland equal the difference between the domestic quantity supplied and the domestic quantity demanded at the world price. Sellers are better off (producer surplus rises from C to B + C + D), and buyers are worse off (consumer surplus falls from A + B to A). Total surplus rises by an amount equal to area D, indicating that trade raises the economic well-being of the country as a whole.

	Before Trade	After Trade	Change
Consumer Surplus	A + B	A	−B
Producer Surplus	C	B + C + D	+(B + D)
Total Surplus	A + B + C	A + B + C + D	+D

The area D shows the increase in total surplus and represents the gains from trade.



After the domestic price has risen to equal the world price, the domestic quantity supplied differs from the domestic quantity demanded. The supply curve shows the quantity of textiles supplied by Isolandian sellers. The demand curve shows the quantity of textiles demanded by Isolandian buyers. Because the domestic quantity supplied is greater than the domestic quantity demanded, Isoland sells textiles to other countries. Thus, Isoland becomes a textile exporter.

Although domestic quantity supplied and domestic quantity demanded differ, the textile market is still in equilibrium because there is now another participant in the market: the rest of the world. One can view the horizontal line at the world price as representing the rest of the world's demand for textiles. This demand curve is perfectly elastic because Isoland, as a small economy, can sell as many textiles as it wants at the world price.

Now consider the gains and losses from opening up trade. Clearly, not everyone benefits. Trade forces the domestic price to rise to the world price. Domestic producers of textiles are better off because they can now sell textiles at a higher price, but domestic consumers of textiles are worse off because they have to buy textiles at a higher price.

To measure these gains and losses, we look at the changes in consumer and producer surplus. Before trade is allowed, the price of textiles adjusts to balance domestic supply and domestic demand. Consumer surplus, the area between the demand curve and the before-trade price, is area A + B. Producer surplus, the area between the supply curve and the before-trade price, is area C. Total surplus before trade, the sum of consumer and producer surplus, is area A + B + C.

After trade is allowed, the domestic price rises to the world price. Consumer surplus is reduced to area A (the area between the demand curve and the world price). Producer surplus is increased to area B + C + D (the area between the supply curve and the world price). Thus, total surplus with trade is area A + B + C + D.

These welfare calculations show who wins and who loses from trade in an exporting country. Sellers benefit because producer surplus increases by the area B + D. Buyers are worse off because consumer surplus decreases by the area B. Because the gains of sellers exceed the losses of buyers by the area D, total surplus in Isoland increases.

This analysis of an exporting country yields two conclusions:

- When a country allows trade and becomes an exporter of a good, domestic producers of the good are better off, and domestic consumers of the good are worse off.
- Trade raises the economic well-being of a nation in the sense that the gains of the winners exceed the losses of the losers.

9-2b The Gains and Losses of an Importing Country

Now suppose that the domestic price before trade is above the world price. Once again, after trade is allowed, the domestic price must equal the world price. As Figure 3 shows, the domestic quantity supplied is less than the domestic quantity demanded. The difference between the domestic quantity demanded and the domestic quantity supplied is bought from other countries, and Isoland becomes a textile importer.

In this case, the horizontal line at the world price represents the supply of the rest of the world. This supply curve is perfectly elastic because Isoland is a small economy and, therefore, can buy as many textiles as it wants at the world price.

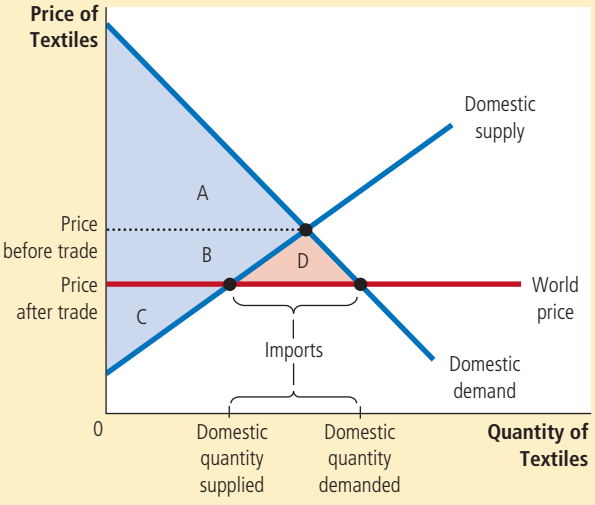
FIGURE 3

International Trade in an Importing Country

Once trade is allowed, the domestic price falls to equal the world price. The supply curve shows the amount produced domestically, and the demand curve shows the amount consumed domestically. Imports equal the difference between the domestic quantity demanded and the domestic quantity supplied at the world price. Buyers are better off (consumer surplus rises from A to A + B + D), and sellers are worse off (producer surplus falls from B + C to C). Total surplus rises by an amount equal to area D, indicating that trade raises the economic well-being of the country as a whole.

	Before Trade	After Trade	Change
Consumer Surplus	A	A + B + D	+(B + D)
Producer Surplus	B + C	C	−B
Total Surplus	A + B + C	A + B + C + D	+D

The area D shows the increase in total surplus and represents the gains from trade.



Now consider the gains and losses from trade. Once again, not everyone benefits. When trade forces the domestic price to fall, domestic consumers are better off (they can now buy textiles at a lower price), and domestic producers are worse off (they now have to sell textiles at a lower price). Changes in consumer and producer surplus measure the size of the gains and losses. Before trade, consumer surplus is area A, producer surplus is area B + C, and total surplus is area A + B + C. After trade is allowed, consumer surplus is area A + B + D, producer surplus is area C, and total surplus is area A + B + C + D.

These welfare calculations show who wins and who loses from trade in an importing country. Buyers benefit because consumer surplus increases by the area B + D. Sellers are worse off because producer surplus falls by the area B. The gains of buyers exceed the losses of sellers, and total surplus increases by the area D.

This analysis of an importing country yields two conclusions parallel to those for an exporting country:

- When a country allows trade and becomes an importer of a good, domestic consumers of the good are better off, and domestic producers of the good are worse off.
- Trade raises the economic well-being of a nation in the sense that the gains of the winners exceed the losers.

Having completed our analysis of trade, we can better understand one of the *Ten Principles of Economics* in Chapter 1: Trade can make everyone better off. If Isoland opens its textile market to international trade, the change creates winners and losers, regardless of whether Isoland ends up exporting or importing textiles. In either case, however, the gains of the winners exceed the losses of the losers, so the winners could compensate the losers and still be better off. In this sense, trade *can* make everyone better off. But *will* trade make everyone better off? Probably not. In practice, compensation for the losers from international trade is rare. Without such compensation, opening an economy to international trade is a policy that expands the size of the economic pie, while perhaps leaving some participants in the economy with a smaller slice.

We can now see why the debate over trade policy is often contentious. Whenever a policy creates winners and losers, the stage is set for a political battle. Nations sometimes fail to enjoy the gains from trade because the losers from free trade are better organized than the winners. The losers may turn their cohesiveness into political clout and lobby for trade restrictions such as tariffs or import quotas.

9-2c The Effects of a Tariff

tariff
tax on goods produced abroad and sold domestically

The Isolandian economists next consider the effects of a **tariff** —a tax on imported goods. The economists quickly realize that a tariff on textiles will have no effect if Isoland becomes a textile exporter. If no one in Isoland is interested in importing textiles, a tax on textile imports is irrelevant. The tariff matters only if Isoland becomes a textile importer. Concentrating their attention on this case, the economists compare welfare with and without the tariff.

Figure 4 shows the Isolandian market for textiles. Under free trade, the domestic price equals the world price. A tariff raises the price of imported textiles above the world price by the amount of the tariff. Domestic suppliers of textiles, who compete with suppliers of imported textiles, can now sell their textiles for the world price plus the amount of the tariff. Thus, the price of textiles—both imported and domestic—rises by the amount of the tariff and is, therefore, closer to the price that would prevail without trade.

The change in price affects the behavior of domestic buyers and sellers. Because the tariff raises the price of textiles, it reduces the domestic quantity demanded from Q_1^D to Q_2^D and raises the domestic quantity supplied from Q_1^S to Q_2^S. *Thus, the tariff reduces the quantity of imports and moves the domestic market closer to its equilibrium without trade.*

Now consider the gains and losses from the tariff. Because the tariff raises the domestic price, domestic sellers are better off, and domestic buyers are worse off. In addition, the government raises revenue. To measure these gains and losses, we look at the changes in consumer surplus, producer surplus, and government revenue. These changes are summarized in the table in Figure 4.

Before the tariff, the domestic price equals the world price. Consumer surplus, the area between the demand curve and the world price, is area A + B + C + D + E + F. Producer surplus, the area between the supply curve and the world price, is area G. Government revenue equals zero. Total surplus, the sum of consumer surplus, producer surplus, and government revenue, is area A + B + C + D + E + F + G.

Once the government imposes a tariff, the domestic price exceeds the world price by the amount of the tariff. Consumer surplus is now area A + B. Producer surplus is area C + G. Government revenue, which is the quantity of after-tariff imports times the size of the tariff, is the area E. Thus, total surplus with the tariff is area A + B + C + E + G.

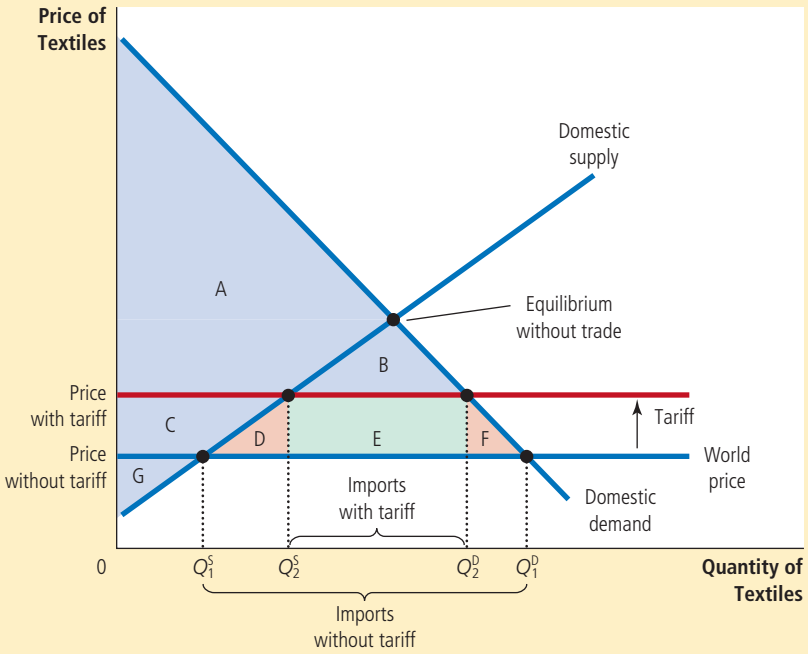
FIGURE 4

The Effects of a Tariff

A tariff reduces the quantity of imports and moves a market closer to the equilibrium that would exist without trade. Total surplus falls by an amount equal to area D + F. These two triangles represent the deadweight loss from the tariff.

	Before Tariff	After Tariff	Change
Consumer Surplus	A + B + C + D + E + F	A + B	−(C + D + E + F)
Producer Surplus	G	C + G	+C
Government Revenue	None	E	+E
Total Surplus	A + B + C + D + E + F + G	A + B + C + E + G	−(D + F)

The area D + F shows the fall in total surplus and represents the deadweight loss of the tariff.



To determine the total welfare effects of the tariff, we add the change in consumer surplus (which is negative), the change in producer surplus (positive), and the change in government revenue (positive). We find that total surplus in the market decreases by the area D + F. This fall in total surplus is called the *deadweight loss* of the tariff.

A tariff causes a deadweight loss because a tariff is a type of tax. Like most taxes, it distorts incentives and pushes the allocation of scarce resources away from the optimum. In this case, we can identify two effects. First, when the tariff raises the domestic price of textiles above the world price, it encourages domestic producers to increase production from Q_1^S to Q_2^S. Even though the

FYI

Import Quotas: Another Way to Restrict Trade

Beyond tariffs, another way that nations sometimes restrict international trade is by putting limits on how much of a good can be imported. In this book, we will not analyze such a policy, other than to point out the conclusion: Import quotas are much like tariffs. Both tariffs and import quotas reduce the quantity of imports, raise the domestic price of the good, decrease the welfare of domestic consumers, increase the welfare of domestic producers, and cause deadweight losses.

There is only one difference between these two types of trade restriction: A tariff raises revenue for the government, whereas an import quota creates surplus for those who obtain the licenses to import. The profit for the holder of an import license is the difference between the domestic price (at which she sells the imported good) and the world price (at which she buys it).

Tariffs and import quotas are even more similar if the government charges a fee for the import licenses. Suppose the government sets the license fee equal to the difference between the domestic price and the world price. In this case, all the profit of license holders is paid to the government in license fees, and the import quota works exactly like a tariff. Consumer surplus, producer surplus, and government revenue are precisely the same under the two policies.

In practice, however, countries that restrict trade with import quotas rarely do so by selling the import licenses. For example, the U.S. government has at times pressured Japan to "voluntarily" limit the sale of Japanese cars in the United States. In this case, the Japanese government allocates the import licenses to Japanese firms, and the surplus from these licenses accrues to those firms. From the standpoint of U.S. welfare, this kind of import quota is worse than a U.S. tariff on imported cars. Both a tariff and an import quota raise prices, restrict trade, and cause deadweight losses, but at least the tariff produces revenue for the U.S. government rather than profit for foreign producers.

cost of making these incremental units exceeds the cost of buying them at the world price, the tariff makes it profitable for domestic producers to manufacture them nonetheless. Second, when the tariff raises the price that domestic textile consumers have to pay, it encourages them to reduce consumption of textiles from Q_1^D to Q_2^D. Even though domestic consumers value these incremental units at more than the world price, the tariff induces them to cut back their purchases. Area D represents the deadweight loss from the overproduction of textiles, and area F represents the deadweight loss from the underconsumption of textiles. The total deadweight loss of the tariff is the sum of these two triangles.

9-2d The Lessons for Trade Policy

The team of Isolandian economists can now write to the new president:

> Dear Madam President,
>
> You asked us three questions about opening up trade. After much hard work, we have the answers.
>
> *Question*: If the government allows Isolandians to import and export textiles, what will happen to the price of textiles and the quantity of textiles sold in the domestic textile market?
>
> *Answer*: Once trade is allowed, the Isolandian price of textiles will be driven to equal the price prevailing around the world.

If the world price is now higher than the Isolandian price, our price will rise. The higher price will reduce the amount of textiles Isolandians consume and raise the amount of textiles that Isolandians produce. Isoland will, therefore, become a textile exporter. This occurs because, in this case, Isoland has a comparative advantage in producing textiles.

Conversely, if the world price is now lower than the Isolandian price, our price will fall. The lower price will raise the amount of textiles that Isolandians consume and lower the amount of textiles that Isolandians produce. Isoland will, therefore, become a textile importer. This occurs because, in this case, other countries have a comparative advantage in producing textiles.

Question: Who will gain from free trade in textiles and who will lose, and will the gains exceed the losses?

Answer: The answer depends on whether the price rises or falls when trade is allowed. If the price rises, producers of textiles gain, and consumers of textiles lose. If the price falls, consumers gain, and producers lose. In both cases, the gains are larger than the losses. Thus, free trade raises the total welfare of Isolandians.

Question: Should a tariff be part of the new trade policy?

Answer: A tariff has an impact only if Isoland becomes a textile importer. In this case, a tariff moves the economy closer to the no-trade equilibrium and, like most taxes, has deadweight losses. A tariff improves the welfare of domestic producers and raises revenue for the government, but these gains are more than offset by the losses suffered by consumers. The best policy, from the standpoint of economic efficiency, would be to allow trade without a tariff.

We hope you find these answers helpful as you decide on your new policy.

Your faithful servants,
Isolandian economics team

9-2e Other Benefits of International Trade

The conclusions of the Isolandian economics team are based on the standard analysis of international trade. Their analysis uses the most fundamental tools in the economist's toolbox: supply, demand, and producer and consumer surplus. It shows that there are winners and losers when a nation opens itself up to trade, but the gains to the winners exceed the losses of the losers.

The case for free trade can be made even stronger, however, because there are several other economic benefits of trade beyond those emphasized in the standard analysis. Here, in a nutshell, are some of these other benefits:

- **Increased variety of goods.** Goods produced in different countries are not exactly the same. German beer, for instance, is not the same as American beer. Free trade gives consumers in all countries greater variety from which to choose.
- **Lower costs through economies of scale.** Some goods can be produced at low cost only if they are produced in large quantities—a phenomenon called *economies of scale*. A firm in a small country cannot take full advantage of economies of scale if it can sell only in a small domestic market. Free trade gives firms access to larger world markets and allows them to realize economies of scale more fully.

IN THE NEWS

Threats to Free Trade

In 2012, as the United States and many other nations around the world were slowly recovering from a deep recession, trade restrictions proved an irresistible temptation to many policymakers.

The Return of the Protectionist Illusion

By Douglas A. Irwin

When the Great Depression struck in the early 1930s, countries imposed high tariffs, import quotas and foreign-exchange controls in the false hope that they might help revive their economies. Instead, these beggar-thy-neighbor policies led to a collapse in world trade. Today the threat of protectionism once again looms across the world.

In order to prop up the peso, Argentina is rationing foreign exchange to sharply limit spending on imports, prompting foreign retaliation. Brazil has been cracking down on automobile imports from Argentina and Mexico. A steady stream of new antidumping duties creates additional obstacles to trade.

Export restrictions have also interrupted trade flows: Indonesia and nickel ore, China and rare-earth minerals, Tanzania and maize. And subtle product regulations are increasingly invoked to block imports. Russia recently banned imports of live animals from the European Union, ostensibly for health and safety reasons, prompting vigorous objections from Brussels.

In addition to these overt measures, there are worrisome proposals on the horizon. The EU is considering a "Buy European" initiative for public procurement that would mimic, and perhaps go well beyond, "Buy American" provisions in U.S. law. These laws give preferences for domestic suppliers in government contracts, limiting trade and raising prices that taxpayers pay for government services. India is considering mandating preferences for purchases of information and communications-technology equipment, not just for government entities but for private firms, as well.

Pascal Lamy, director general of the World Trade Organization (WTO), says these and other measures restricting or potentially restricting trade are "now a matter of serious concern." EU Trade Commissioner Karel De Gucht is also worried by what he characterizes as "the sharp rise in trade-restrictive measures introduced over the last eight months."

G-20 leaders at the recent summit in Los Cabos, Mexico, claimed they too were "deeply concerned about rising instances of protectionism around the world," and reaffirmed their "standstill commitment" to avoid imposing new trade restrictions. They pledged to "roll back any new protectionist measure that may have arisen, including new export restrictions and WTO-inconsistent measures to stimulate exports."

Talk is cheap. Global Trade Alert, a monitoring service run by Simon Evenett at the University of St. Gallen, Switzerland, points out that the G-20 countries themselves have been most responsible for the protectionist creep. Many trade measures enacted by G-20 members exploit loopholes in WTO rules.

Unfortunately, President Obama has provided no leadership in trying to keep world markets open for trade. Out of fear of offending labor unions and other domestic constituencies, his administration long delayed submitting free trade agreements with Korea, Colombia and Panama for congressional approval. Instead of seeking to reinvigorate the languishing Doha round of trade negotiations at the WTO, it has been almost completely passive and allowed world-trade policies to drift.

Congress has also done little to help. Senate Republicans and Democrats teamed up late last month to maintain import restrictions for the sugar industry, defeating an amendment from Sen. Jeanne Shaheen (D., N.H.) that would have gradually eliminated them. Keeping domestic sugar prices at twice the world level helps a few sugar-cane and beet farmers at the expense of consumers and taxpayers, while leading to job losses in sugar-using industries, such as candy and confectionary manufacturing….

Any serious march backward toward protectionism would constitute a major failure of economic policy. Experience has shown that, once imposed, trade restrictions are very difficult to remove because vested interests then have a stake in perpetuating them. Protectionism also breeds foreign retaliation, making barriers doubly difficult to unwind. Now is no time to entertain dangerous illusions.

Mr. Irwin is professor of economics at Dartmouth College and author of Trade Policy Disaster: Lessons from the 1930s *(MIT Press, 2012).*

- **Increased competition.** A company shielded from foreign competitors is more likely to have market power, which in turn gives it the ability to raise prices above competitive levels. This is a type of market failure. Opening up trade fosters competition and gives the invisible hand a better chance to work its magic.

- **Enhanced flow of ideas.** The transfer of technological advances around the world is often thought to be linked to the trading of the goods that embody those advances. The best way for a poor agricultural nation to learn about the computer revolution, for instance, is to buy some computers from abroad rather than trying to make them domestically.

Thus, free international trade increases variety for consumers, allows firms to take advantage of economies of scale, makes markets more competitive, and facilitates the spread of technology. If the Isolandian economists also took these effects into account, their advice to their president would be even more forceful.

Quick Quiz *Draw a supply-and-demand diagram for wool suits in the country of Autarka. When trade is allowed, the price of a suit falls from 3 to 2 ounces of gold. In your diagram, show the change in consumer surplus, the change in producer surplus, and the change in total surplus. How would a tariff on suit imports alter these effects?*

9-3 The Arguments for Restricting Trade

The letter from the economics team starts to persuade the new president of Isoland to consider allowing trade in textiles. She notes that the domestic price is now high compared to the world price. Free trade would, therefore, cause the price of textiles to fall and hurt domestic textile producers. Before implementing the new policy, she asks Isolandian textile companies to comment on the economists' advice.

Not surprisingly, the textile companies oppose free trade in textiles. They believe that the government should protect the domestic textile industry from foreign competition. Let's consider some of the arguments they might give to support their position and how the economics team would respond.

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"You like protectionism as a 'working man.' How about as a consumer?"

IN THE NEWS

Should the Winners from Free Trade Compensate the Losers?

Politicians and pundits often say that the government should help workers made worse off by international trade by, for example, paying for their retraining. In this opinion piece, an economist makes the opposite case.

What to Expect When You're Free Trading

By Steven E. Landsburg

All economists know that when American jobs are outsourced, Americans as a group are net winners. What we lose through lower wages is more than offset by what we gain through lower prices. In other words, the winners can more than afford to compensate the losers. Does that mean they ought to? Does it create a moral mandate for taxpayer-subsidized retraining programs?…

Um, no. Even if you've just lost your job, there's something fundamentally churlish about blaming the very phenomenon that's elevated you above the subsistence level since the day you were born. If the world owes you compensation for enduring the downside of trade, what do you owe the world for enjoying the upside?

I doubt there's a human being on earth who hasn't benefited from the opportunity to trade freely with his neighbors. Imagine what your life would be like if you had to grow your own food, make your own clothes and rely on your grandmother's home remedies for health care. Access to a trained physician might reduce the demand for grandma's home remedies, but—especially at her age—she's still got plenty of reason to be thankful for having a doctor.

Some people suggest, however, that it makes sense to isolate the moral effects of a single new trading opportunity or free trade agreement. Surely we have fellow citizens who are hurt by those agreements, at least in the limited sense that they'd be better off in a world where trade flourishes, except in this one instance. What do we owe those fellow citizens?

One way to think about that is to ask what your moral instincts tell you in analogous situations. Suppose, after years of buying shampoo at your local pharmacy, you discover you can order the same shampoo for less money on the Web. Do you have an obligation to compensate your pharmacist? If you move to a cheaper apartment, should you compensate your landlord? When you eat at McDonald's, should you compensate the owners of the diner next door? Public policy should not be designed to advance moral instincts that we all reject every day of our lives.

In what morally relevant way, then, might displaced workers differ from displaced pharmacists or displaced landlords? You might argue that pharmacists and landlords have always faced cutthroat competition and therefore knew what they were getting into, while decades of tariffs and quotas have led manufacturing workers to expect a modicum of protection. That expectation led them to develop certain skills, and now it's unfair to pull the rug out from under them.

Once again, that argument does not mesh with our everyday instincts. For many decades, schoolyard bullying has been a profitable occupation. All across America, bullies have built up skills so they can take advantage of that opportunity. If we toughen the rules to make bullying unprofitable, must we compensate the bullies?

Bullying and protectionism have a lot in common. They both use force (either directly or through the power of the law) to enrich someone else at your involuntary expense. If you're forced to pay $20 an hour to an American for goods you could have bought from a Mexican for $5 an hour, you're being extorted. When a free trade agreement allows you to buy from the Mexican after all, rejoice in your liberation.

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Source: *New York Times*, January 16, 2008.

9-3a The Jobs Argument

Opponents of free trade often argue that trade with other countries destroys domestic jobs. In our example, free trade in textiles would cause the price of textiles to fall, reducing the quantity of textiles produced in Isoland and thus reducing employment in the Isolandian textile industry. Some Isolandian textile workers would lose their jobs.

Yet free trade creates jobs at the same time that it destroys them. When Isolandians buy textiles from other countries, those countries obtain the resources to buy other goods from Isoland. Isolandian workers would move from the textile

industry to those industries in which Isoland has a comparative advantage. The transition may impose hardship on some workers in the short run, but it allows Isolandians as a whole to enjoy a higher standard of living.

Opponents of trade are often skeptical that trade creates jobs. They might respond that *everything* can be produced more cheaply abroad. Under free trade, they might argue, Isolandians could not be profitably employed in any industry. As Chapter 3 explains, however, the gains from trade are based on comparative advantage, not absolute advantage. Even if one country is better than another country at producing everything, each country can still gain from trading with the other. Workers in each country will eventually find jobs in an industry in which that country has a comparative advantage.

9-3b The National-Security Argument

When an industry is threatened with competition from other countries, opponents of free trade often argue that the industry is vital to national security. For example, if Isoland were considering free trade in steel, domestic steel companies might point out that steel is used to make guns and tanks. Free trade would allow Isoland to become dependent on foreign countries to supply steel. If a war later broke out and the foreign supply was interrupted, Isoland might be unable to produce enough steel and weapons to defend itself.

IN THE NEWS

Second Thoughts about Free Trade

Some economists worry about the impact of trade on the distribution of income. Even if free trade enhances efficiency, it may reduce equality.

Trouble with Trade

By Paul Krugman

While the United States has long imported oil and other raw materials from the third world, we used to import manufactured goods mainly from other rich countries like Canada, European nations and Japan.

But recently we crossed an important watershed: we now import more manufactured goods from the third world than from other advanced economies. That is, a majority of our industrial trade is now with countries that are much poorer than we are and that pay their workers much lower wages.

For the world economy as a whole—and especially for poorer nations—growing trade between high-wage and low-wage countries is a very good thing. Above all, it offers backward economies their best hope of moving up the income ladder.

But for American workers the story is much less positive. In fact, it's hard to avoid the conclusion that growing U.S. trade with third-world countries reduces the real wages of many and perhaps most workers in this country. And that reality makes the politics of trade very difficult.

Let's talk for a moment about the economics.

Trade between high-wage countries tends to be a modest win for all, or almost all, concerned. When a free-trade pact made it possible to integrate the U.S. and Canadian auto industries in the 1960s, each country's industry concentrated on producing a narrower range of products at larger scale. The result was an all-round, broadly shared rise in productivity and wages.

By contrast, trade between countries at very different levels of economic development tends to create large classes of losers as well as winners.

Although the outsourcing of some high-tech jobs to India has made headlines, on balance, highly educated workers in the United States benefit from higher wages and expanded job opportunities because of trade. For example, ThinkPad notebook computers are now made by a Chinese company, Lenovo, but a lot of Lenovo's research and development is conducted in North Carolina.

Economists acknowledge that protecting key industries may be appropriate when there are legitimate concerns over national security. Yet they fear that this argument may be used too quickly by producers eager to gain at consumers' expense.

One should be wary of the national-security argument when it is made by representatives of industry rather than the defense establishment. Companies have an incentive to exaggerate their role in national defense to obtain protection from foreign competition. A nation's generals may see things very differently. Indeed, when the military is a consumer of an industry's output, it would benefit from imports. Cheaper steel in Isoland, for example, would allow the Isolandian military to accumulate a stockpile of weapons at lower cost.

9-3c The Infant-Industry Argument

New industries sometimes argue for temporary trade restrictions to help them get started. After a period of protection, the argument goes, these industries will mature and be able to compete with foreign firms.

Similarly, older industries sometimes argue that they need temporary protection to help them adjust to new conditions. For example, in 2002, President Bush imposed temporary tariffs on imported steel. He said, "I decided that imports were severely affecting our industry, an important industry." The tariff, which lasted 20 months, offered "temporary relief so that the industry could restructure itself."

But workers with less formal education either see their jobs shipped overseas or find their wages driven down by the ripple effect as other workers with similar qualifications crowd into their industries and look for employment to replace the jobs they lost to foreign competition. And lower prices at Wal-Mart aren't sufficient compensation.

All this is textbook international economics: contrary to what people sometimes assert, economic theory says that free trade normally makes a country richer, but it doesn't say that it's normally good for everyone. Still, when the effects of third-world exports on U.S. wages first became an issue in the 1990s, a number of economists—myself included—looked at the data and concluded that any negative effects on U.S. wages were modest.

The trouble now is that these effects may no longer be as modest as they were, because imports of manufactured goods from the third world have grown dramatically—from just 2.5 percent of G.D.P. in 1990 to 6 percent in 2006.

And the biggest growth in imports has come from countries with very low wages. The original "newly industrializing economies" exporting manufactured goods—South Korea, Taiwan, Hong Kong and Singapore—paid wages that were about 25 percent of U.S. levels in 1990. Since then, however, the sources of our imports have shifted to Mexico, where wages are only 11 percent of the U.S. level, and China, where they're only about 3 percent or 4 percent.

There are some qualifying aspects to this story. For example, many of those made-in-China goods contain components made in Japan and other high-wage economies. Still, there's little doubt that the pressure of globalization on American wages has increased.

So am I arguing for protectionism? No. Those who think that globalization is always and everywhere a bad thing are wrong. On the contrary, keeping world markets relatively open is crucial to the hopes of billions of people.

But I am arguing for an end to the finger-wagging, the accusation either of not understanding economics or of kowtowing to special interests that tends to be the editorial response to politicians who express skepticism about the benefits of free-trade agreements.

It's often claimed that limits on trade benefit only a small number of Americans, while hurting the vast majority. That's still true of things like the import quota on sugar. But when it comes to manufactured goods, it's at least arguable that the reverse is true. The highly educated workers who clearly benefit from growing trade with third-world economies are a minority, greatly outnumbered by those who probably lose.

As I said, I'm not a protectionist. For the sake of the world as a whole, I hope that we respond to the trouble with trade not by shutting trade down, but by doing things like strengthening the social safety net. But those who are worried about trade have a point, and deserve some respect.

Mr. Krugman is a professor of economics at Princeton University and winner of the 2008 Nobel Prize in economics.

Source: *New York Times*, December 28, 2007.

Economists are often skeptical about such claims, largely because the infant-industry argument is difficult to implement in practice. To apply protection successfully, the government would need to decide which industries will eventually be profitable and decide whether the benefits of establishing these industries exceed the costs of this protection to consumers. Yet "picking winners" is extraordinarily difficult. It is made even more difficult by the political process, which often awards protection to those industries that are politically powerful. And once a powerful industry is protected from foreign competition, the "temporary" policy is sometimes hard to remove.

In addition, many economists are skeptical about the infant-industry argument in principle. Suppose, for instance, that an industry is young and unable to compete profitably against foreign rivals, but there is reason to believe that the industry can be profitable in the long run. In this case, firm owners should be willing to incur temporary losses to obtain the eventual profits. Protection is not necessary for an infant industry to grow. History shows that start-up firms often incur temporary losses and succeed in the long run, even without protection from competition.

9-3d The Unfair-Competition Argument

A common argument is that free trade is desirable only if all countries play by the same rules. If firms in different countries are subject to different laws and regulations, then it is unfair (the argument goes) to expect the firms to compete in the international marketplace. For instance, suppose that the government of Neighborland subsidizes its textile industry by giving textile companies large tax breaks. The Isolandian textile industry might argue that it should be protected from this foreign competition because Neighborland is not competing fairly.

Would it, in fact, hurt Isoland to buy textiles from another country at a subsidized price? Certainly, Isolandian textile producers would suffer, but Isolandian textile consumers would benefit from the low price. The case for free trade is the same as before: The gains of the consumers from buying at the low price would exceed the losses of the producers. Neighborland's subsidy to its textile industry may be a bad policy, but it is the taxpayers of Neighborland who bear the burden. Isoland can benefit from the opportunity to buy textiles at a subsidized price. Rather than objecting to the foreign subsidies, perhaps Isoland should send Neighborland a thank-you note.

9-3e The Protection-as-a-Bargaining-Chip Argument

Another argument for trade restrictions concerns the strategy of bargaining. Many policymakers claim to support free trade but, at the same time, argue that trade restrictions can be useful when we bargain with our trading partners. They claim that the threat of a trade restriction can help remove a trade restriction already imposed by a foreign government. For example, Isoland might threaten to impose a tariff on textiles unless Neighborland removes its tariff on wheat. If Neighborland responds to this threat by removing its tariff, the result can be freer trade.

The problem with this bargaining strategy is that the threat may not work. If it doesn't work, the country faces a choice between two bad options. It can carry out its threat and implement the trade restriction, which would reduce

its own economic welfare. Or it can back down from its threat, which would cause it to lose prestige in international affairs. Faced with this choice, the country would probably wish that it had never made the threat in the first place.

case study

Trade Agreements and the World Trade Organization

A country can take one of two approaches to achieving free trade. It can take a *unilateral* approach and remove its trade restrictions on its own. This is the approach that Great Britain took in the 19th century and that Chile and South Korea have taken in recent years. Alternatively, a country can take a *multilateral* approach and reduce its trade restrictions while other countries do the same. In other words, it can bargain with its trading partners in an attempt to reduce trade restrictions around the world.

One important example of the multilateral approach is the North American Free Trade Agreement (NAFTA), which in 1993 lowered trade barriers among the United States, Mexico, and Canada. Another is the General Agreement on Tariffs and Trade (GATT), which is a continuing series of negotiations among many of the world's countries with the goal of promoting free trade. The United States helped to found GATT after World War II in response to the high tariffs imposed during the Great Depression of the 1930s. Many economists believe that the high tariffs contributed to the worldwide economic hardship of that period. GATT has successfully reduced the average tariff among member countries from about 40 percent after World War II to about 5 percent today.

The rules established under GATT are now enforced by an international institution called the World Trade Organization (WTO). The WTO was established in 1995 and has its headquarters in Geneva, Switzerland. As of 2009, 153 countries have joined the organization, accounting for more than 97 percent of world trade. The functions of the WTO are to administer trade agreements, provide a forum for negotiations, and handle disputes among member countries.

What are the pros and cons of the multilateral approach to free trade? One advantage is that the multilateral approach has the potential to result in freer trade than a unilateral approach because it can reduce trade restrictions abroad as well as at home. If international negotiations fail, however, the result could be more restricted trade than under a unilateral approach.

In addition, the multilateral approach may have a political advantage. In most markets, producers are fewer and better organized than consumers—and thus wield greater political influence. Reducing the Isolandian tariff on textiles, for example, may be politically difficult if considered by itself. The textile companies would oppose free trade, and the buyers of textiles who would benefit are so numerous that organizing their support would be difficult. Yet suppose that Neighborland promises to reduce its tariff on wheat at the same time that Isoland reduces its tariff on textiles. In this case, the Isolandian wheat farmers, who are also politically powerful, would back the agreement. Thus, the multilateral approach to free trade can sometimes win political support when a unilateral approach cannot. ◢

Quick Quiz *The textile industry of Autarka advocates a ban on the import of wool suits. Describe five arguments its lobbyists might make. Give a response to each of these arguments.*

9-4 Conclusion

Economists and the public often disagree about free trade. In 2008, the *Los Angeles Times* asked the American public, "Generally speaking, do you believe that free international trade has helped or hurt the economy, or hasn't it made a difference to the economy one way or the other?" Only 26 percent of those polled said free international trade helped, whereas 50 percent thought it hurt. (The rest thought it made no difference or were unsure.) By contrast, most economists support free international trade. They view free trade as a way of allocating production efficiently and raising living standards both at home and abroad.

Economists view the United States as an ongoing experiment that confirms the virtues of free trade. Throughout its history, the United States has allowed unrestricted trade among the states, and the country as a whole has benefited from the specialization that trade allows. Florida grows oranges, Alaska pumps oil, California makes wine, and so on. Americans would not enjoy the high standard of living they do today if people could consume only those goods and services produced in their own states. The world could similarly benefit from free trade among countries.

To better understand economists' view of trade, let's continue our parable. Suppose that the president of Isoland, after reading the latest poll results, ignores the advice of her economics team and decides not to allow free trade in textiles. The country remains in the equilibrium without international trade.

Then, one day, some Isolandian inventor discovers a new way to make textiles at very low cost. The process is quite mysterious, however, and the inventor insists on keeping it a secret. What is odd is that the inventor doesn't need traditional inputs such as cotton or wool. The only material input he needs is wheat. And even more oddly, to manufacture textiles from wheat, he hardly needs any labor input at all.

The inventor is hailed as a genius. Because everyone buys clothing, the lower cost of textiles allows all Isolandians to enjoy a higher standard of living. Workers who had previously produced textiles experience some hardship when their factories close, but they eventually find work in other industries. Some become farmers and grow the wheat that the inventor turns into textiles. Others enter new industries that emerge as a result of higher Isolandian living standards. Everyone understands that the displacement of workers in outmoded industries is an inevitable part of technological progress and economic growth.

After several years, a newspaper reporter decides to investigate this mysterious new textiles process. She sneaks into the inventor's factory and learns that the inventor is a fraud. The inventor has not been making textiles at all. Instead, he has been smuggling wheat abroad in exchange for textiles from other countries. The only thing that the inventor had discovered was the gains from international trade.

When the truth is revealed, the government shuts down the inventor's operation. The price of textiles rises, and workers return to jobs in textile factories. Living standards in Isoland fall back to their former levels. The inventor is jailed and held up to public ridicule. After all, he was no inventor. He was just an economist.

Summary

- The effects of free trade can be determined by comparing the domestic price without trade to the world price. A low domestic price indicates that the country has a comparative advantage in producing the good and that the country will become an exporter. A high domestic price indicates that the rest of the world has a comparative advantage in producing the good and that the country will become an importer.
- When a country allows trade and becomes an exporter of a good, producers of the good are better off, and consumers of the good are worse off. When a country allows trade and becomes an importer of a good, consumers are better off, and producers are worse off. In both cases, the gains from trade exceed the losses.
- A tariff—a tax on imports—moves a market closer to the equilibrium that would exist without trade and, therefore, reduces the gains from trade. Although domestic producers are better off and the government raises revenue, the losses to consumers exceed these gains.
- There are various arguments for restricting trade: protecting jobs, defending national security, helping infant industries, preventing unfair competition, and responding to foreign trade restrictions. Although some of these arguments have merit in some cases, economists believe that free trade is usually the better policy.

Key Concepts

world price, *p. 173*

tariff, *p. 177*

Questions for Review

1. What does the domestic price that prevails without international trade tell us about a nation's comparative advantage?
2. When does a country become an exporter of a good? An importer?
3. Draw the supply-and-demand diagram for an importing country. What is consumer surplus and producer surplus before trade is allowed? What is consumer surplus and producer surplus with free trade? What is the change in total surplus?
4. Describe what a tariff is and its economic effects.
5. List five arguments often given to support trade restrictions. How do economists respond to these arguments?
6. What is the difference between the unilateral and multilateral approaches to achieving free trade? Give an example of each.

Quick Check Multiple Choice

1. If a nation that does not allow international trade in steel has a domestic price of steel lower than the world price, then
   a. the nation has a comparative advantage in producing steel and would become a steel exporter if it opened up trade.
   b. the nation has a comparative advantage in producing steel and would become a steel importer if it opened up trade.
   c. the nation does not have a comparative advantage in producing steel and would become a steel exporter if it opened up trade.
   d. the nation does not have a comparative advantage in producing steel and would become a steel importer if it opened up trade.
2. When the nation of Ectenia opens itself to world trade in coffee beans, the domestic price of coffee beans falls. Which of the following describes the situation?
   a. Domestic production of coffee rises, and Ectenia becomes a coffee importer.
   b. Domestic production of coffee rises, and Ectenia becomes a coffee exporter.
   c. Domestic production of coffee falls, and Ectenia becomes a coffee importer.
   d. Domestic production of coffee falls, and Ectenia becomes a coffee exporter.
3. When a nation opens itself to trade in a good and becomes an importer,
   a. producer surplus decreases, but consumer surplus and total surplus both increase.
   b. producer surplus decreases, consumer surplus increases, and so the impact on total surplus is ambiguous.
   c. producer surplus and total surplus increase, but consumer surplus decreases.
   d. producer surplus, consumer surplus, and total surplus all increase.

4. If a nation that imports a good imposes a tariff, it will increase
   a. the domestic quantity demanded.
   b. the domestic quantity supplied.
   c. the quantity imported from abroad.
   d. all of the above.
5. Which of the following trade policies would benefit producers, hurt consumers, and increase the amount of trade?
   a. the increase of a tariff in an importing country
   b. the reduction of a tariff in an importing country
   c. starting to allow trade when the world price is greater than the domestic price
   d. starting to allow trade when the world price is less than the domestic price
6. The main difference between imposing a tariff and handing out licenses under an import quota is that a tariff increases
   a. consumer surplus.
   b. producer surplus.
   c. international trade.
   d. government revenue.

Problems and Applications

1. The world price of wine is below the price that would prevail in Canada in the absence of trade.
   a. Assuming that Canadian imports of wine are a small part of total world wine production, draw a graph for the Canadian market for wine under free trade. Identify consumer surplus, producer surplus, and total surplus in an appropriate table.
   b. Now suppose that an unusual shift of the Gulf Stream leads to an unseasonably cold summer in Europe, destroying much of the grape harvest there. What effect does this shock have on the world price of wine? Using your graph and table from part (a), show the effect on consumer surplus, producer surplus, and total surplus in Canada. Who are the winners and losers? Is Canada as a whole better or worse off?
2. Suppose that Congress imposes a tariff on imported autos to protect the U.S. auto industry from foreign competition. Assuming that the United States is a price taker in the world auto market, show the following on a diagram: the change in the quantity of imports, the loss to U.S. consumers, the gain to U.S. manufacturers, government revenue, and the deadweight loss associated with the tariff. The loss to consumers can be decomposed into three pieces: a gain to domestic producers, revenue for the government, and a deadweight loss. Use your diagram to identify these three pieces.
3. When China's clothing industry expands, the increase in world supply lowers the world price of clothing.
   a. Draw an appropriate diagram to analyze how this change in price affects consumer surplus, producer surplus, and total surplus in a nation that imports clothing, such as the United States.
   b. Now draw an appropriate diagram to show how this change in price affects consumer surplus, producer surplus, and total surplus in a nation that exports clothing, such as the Dominican Republic.
   c. Compare your answers to parts (a) and (b). What are the similarities and what are the differences? Which country should be concerned about the expansion of the Chinese textile industry? Which country should be applauding it? Explain.
4. Consider the arguments for restricting trade.
   a. Imagine that you are a lobbyist for timber, an established industry suffering from low-priced foreign competition, and you are trying to get Congress to pass trade restrictions. Which two or three of the five arguments do you think would be most persuasive to the average member of Congress? Explain your reasoning.
   b. Now assume you are an astute student of economics (not a hard assumption, we hope). Although all the arguments for restricting trade have their shortcomings, name the two or three arguments that seem to make the most economic sense to you. For each, describe the economic rationale for and against these arguments for trade restrictions.
5. The nation of Textilia does not allow imports of clothing. In its equilibrium without trade, a T-shirt costs $20, and the equilibrium quantity is 3 million T-shirts. One day, after reading Adam Smith's *The Wealth of Nations* while on vacation, the president decides to open the Textilian market to international trade. The market price of a T-shirt falls to the world price of $16. The number of T-shirts consumed in Textilia rises to 4 million, while the number of T-shirts produced declines to 1 million.
   a. Illustrate the situation just described in a graph. Your graph should show all the numbers.
   b. Calculate the change in consumer surplus, producer surplus, and total surplus that results from opening up trade. (*Hint*: Recall that the area of a triangle is ½ × base × height.)

6. China is a major producer of grains, such as wheat, corn, and rice. In 2008, the Chinese government, concerned that grain exports were driving up food prices for domestic consumers, imposed a tax on grain exports.
   a. Draw the graph that describes the market for grain in an exporting country. Use this graph as the starting point to answer the following questions.
   b. How does an export tax affect domestic grain prices?
   c. How does it affect the welfare of domestic consumers, the welfare of domestic producers, and government revenue?
   d. What happens to total welfare in China, as measured by the sum of consumer surplus, producer surplus, and tax revenue?

7. Consider a country that imports a good from abroad. For each of following statements, state whether it is true or false. Explain your answer.
   a. "The greater the elasticity of demand, the greater the gains from trade."
   b. "If demand is perfectly inelastic, there are no gains from trade."
   c. "If demand is perfectly inelastic, consumers do not benefit from trade."

8. Kawmin is a small country that produces and consumes jelly beans. The world price of jelly beans is $1 per bag, and Kawmin's domestic demand and supply for jelly beans are governed by the following equations:

   Demand: $Q^D = 8 - P$
   Supply: $Q^S = P$,

   where P is in dollars per bag and Q is in bags of jelly beans.
   a. Draw a well-labeled graph of the situation in Kawmin if the nation does not allow trade. Calculate the following (recalling that the area of a triangle is ½ × base × height): the equilibrium price and quantity, consumer surplus, producer surplus, and total surplus.
   b. Kawmin then opens the market to trade. Draw another graph to describe the new situation in the jelly bean market. Calculate the equilibrium price, quantities of consumption and production, imports, consumer surplus, producer surplus, and total surplus.
   c. After a while, the Czar of Kawmin responds to the pleas of jelly bean producers by placing a $1 per bag tariff on jelly bean imports. On a graph, show the effects of this tariff. Calculate the equilibrium price, quantities of consumption and production, imports, consumer surplus, producer surplus, government revenue, and total surplus.
   d. What are the gains from opening up trade? What are the deadweight losses from restricting trade with the tariff? Give numerical answers.

9. Having rejected a tariff on textiles (a tax on imports), the president of Isoland is now considering the same-sized tax on textile consumption (including both imported and domestically produced textiles).
   a. Using Figure 4, identify the quantity consumed and the quantity produced in Isoland under a textile consumption tax.
   b. Construct a table similar to that in Figure 4 for the textile consumption tax.
   c. Which raises more revenue for the government—the consumption tax or the tariff? Which has a smaller deadweight loss? Explain.

10. Assume the United States is an importer of televisions and there are no trade restrictions. U.S. consumers buy 1 million televisions per year, of which 400,000 are produced domestically and 600,000 are imported.
    a. Suppose that a technological advance among Japanese television manufacturers causes the world price of televisions to fall by $100. Draw a graph to show how this change affects the welfare of U.S. consumers and U.S. producers and how it affects total surplus in the United States.
    b. After the fall in price, consumers buy 1.2 million televisions, of which 200,000 are produced domestically and 1 million are imported. Calculate the change in consumer surplus, producer surplus, and total surplus from the price reduction.
    c. If the government responded by putting a $100 tariff on imported televisions, what would this do? Calculate the revenue that would be raised and the deadweight loss. Would it be a good policy from the standpoint of U.S. welfare? Who might support the policy?
    d. Suppose that the fall in price is attributable not to technological advance but to a $100 per television subsidy from the Japanese government to Japanese industry. How would this affect your analysis?

11. Consider a small country that exports steel. Suppose that a "pro-trade" government decides to subsidize the export of steel by paying a certain amount for each ton sold abroad. How does this export subsidy affect the domestic price of steel, the quantity of steel produced, the quantity of steel consumed, and the quantity of steel exported? How does it affect consumer surplus, producer surplus, government revenue, and total surplus? Is it a good policy from the standpoint of economic efficiency? (*Hint*: The analysis of an export subsidy is similar to the analysis of a tariff.)