

Public Affairs 856
Trade, Competition, and
Governance in a Global Economy
Lecture 14
3/11/2019

Instructor: Prof. Menzie Chinn
UW Madison
Spring 2019

Import Tariffs and Quotas Under Imperfect Competition

1. Tariffs and Quotas with Home Monopoly
2. Tariffs with Foreign Monopoly
3. Dumping
4. Policy Response to Dumping
5. Infant Industry Protection

Introduction

Do the effects of trade policies differ when markets are imperfectly competitive? We explore the answer to this question in this chapter and the next.

This question received a good deal of attention from trade economists in the 1980s, in a body of research that became known as **strategic trade policy**.

In this chapter, we use the extreme case of a single producer—a Home or Foreign monopoly—to see how tariffs and quotas affect prices, trade, and welfare.

Introduction

A specific example of a Foreign monopolist is the Foreign **discriminating monopoly**, which charges a lower price to Home than to firms in its own local market and is therefore **dumping** its product into the Home market.

A tariff applied against the Foreign discriminating monopoly is called an **antidumping duty**.

The final case we analyze is an **infant industry** at Home, by which we mean an industry that is too young to have achieved its lowest costs.

1 Tariffs and Quotas with Home Monopoly

- Tariffs and quotas affect the trade equilibrium differently because of their impact on the Home monopoly's **market power**, the extent to which a firm can choose its price.
- With a tariff, the Home monopolist still competes against a large number of importers, limiting its market power.
- With a quota, once the quota is reached, the monopolist is the only producer able to sell in the Home market. The monopolist is again able to exercise its market power.
- This section looks at Home equilibrium with and without trade, and explains the difference between tariffs and quotas.

1 Tariffs and Quotas with Home Monopoly

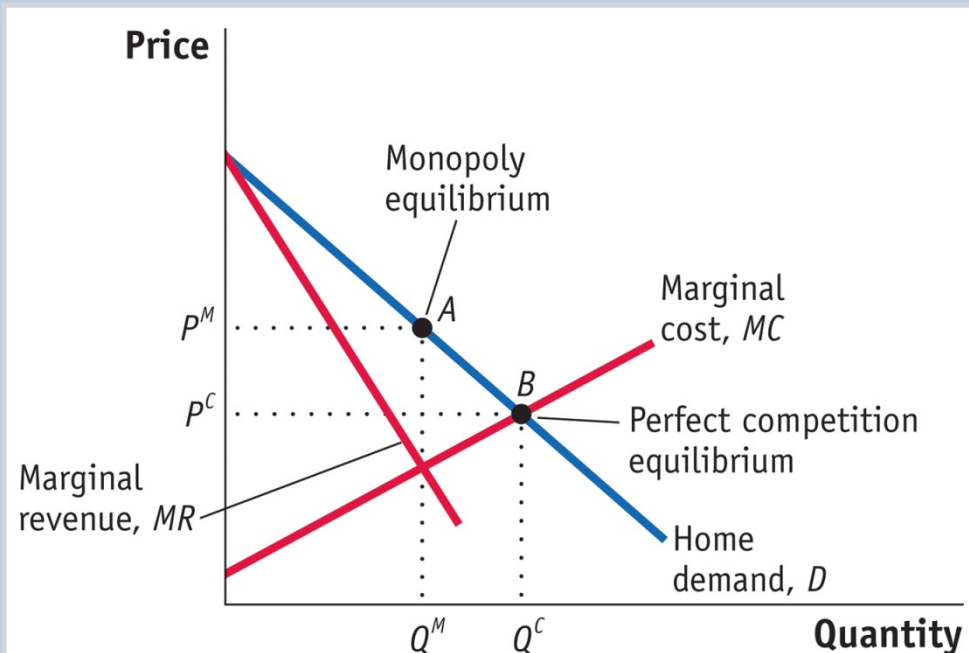
No-Trade Equilibrium

- The extra revenue earned from selling one more unit is the **marginal revenue**.
- To maximize its profits, the monopolist produces at the point where the marginal revenue, MR , earned from selling one more unit equals the marginal cost, MC , of producing one more unit.

1 Tariffs and Quotas with Home Monopoly

No-Trade Equilibrium

FIGURE 9-1



No-Trade Equilibrium In the absence of international trade, the monopoly equilibrium at Home occurs at the quantity Q^M , where marginal revenue equals marginal cost.

From that quantity, we trace up to the demand curve at point A , and the price charged is P^M .

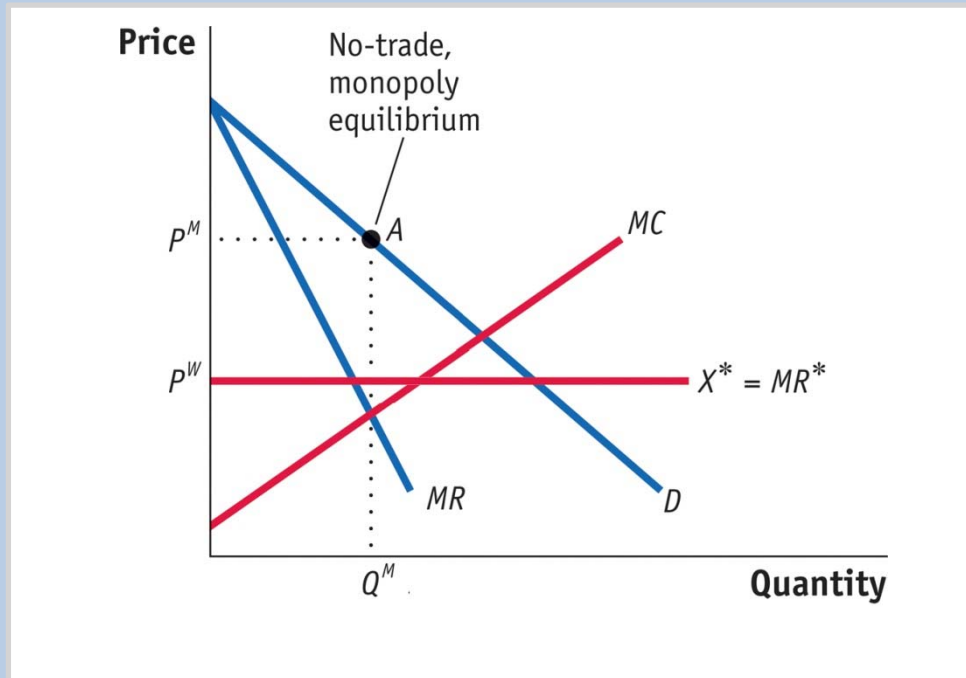
Under perfect competition, the industry supply curve is MC , so the no-trade equilibrium would occur where demand equals supply (point B), at the quantity Q^C and the price P^C .

Comparison with Perfect Competition In the absence of trade, the monopolist restricts its quantity sold to increase the market price. Under free trade, however, the monopolist cannot limit quantity and raise price.

1 Tariffs and Quotas with Home Monopoly

Free-Trade Equilibrium

FIGURE 9-2 (1 of 2) Home Monopoly's Free-Trade Equilibrium



Under free trade at the fixed world price P^W , Home faces Foreign export supply of X^* at that price.

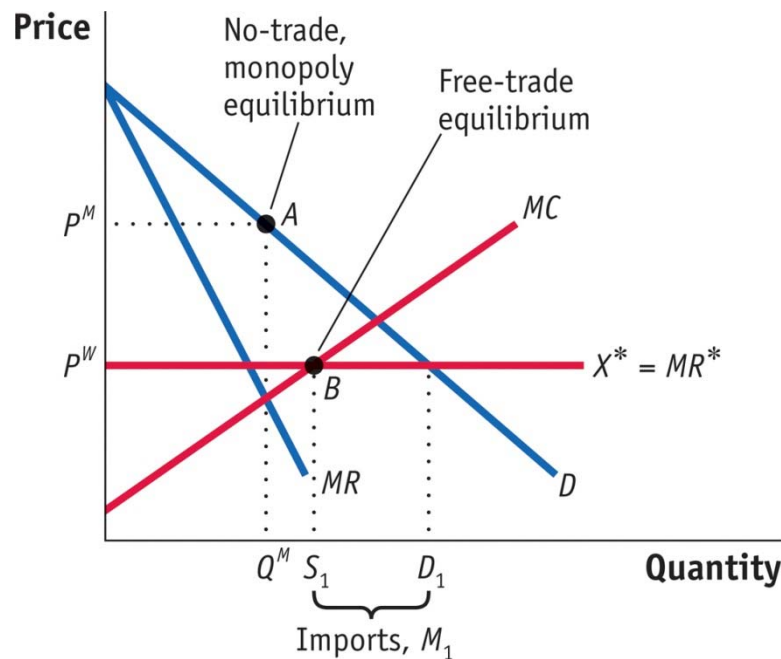
Because the Home firm cannot raise its price above P^W without losing all of its customers to imports, X^* is now also the demand curve faced by the Home monopolist.

Because the price is fixed, the marginal revenue MR^* is the same as the demand curve. Profits are maximized at point B , where marginal revenue equals marginal costs.

1 Tariffs and Quotas with Home Monopoly

Free-Trade Equilibrium

FIGURE 9-2 (2 of 2) Home Monopoly's Free-Trade Equilibrium (continued)



The Home firm supplies S_1 , and Home consumers demand D_1 . The difference between these is imports, $M_1 = D_1 - S_1$.

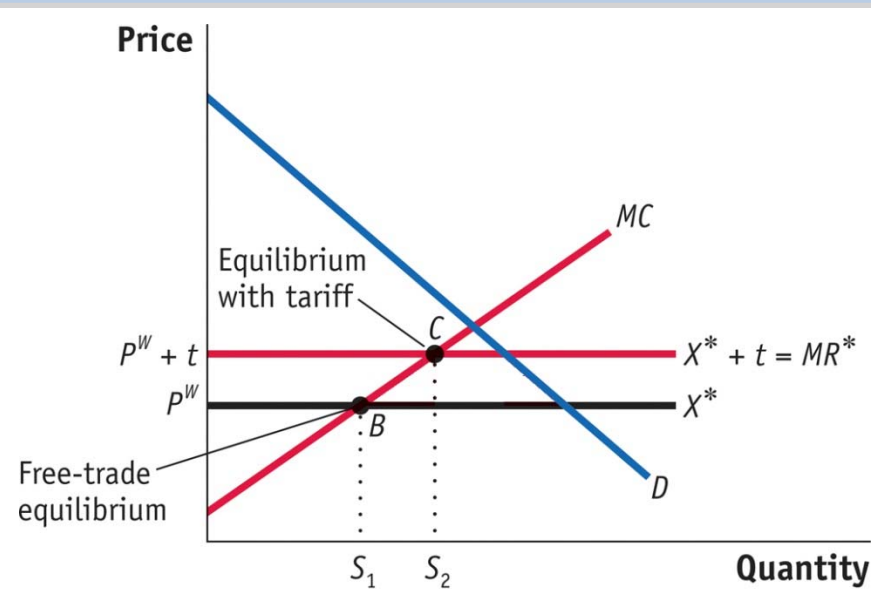
Because the Home monopoly now sets its price at marginal cost, the same free-trade equilibrium holds under perfect competition.

Comparison with Perfect Competition Under free trade for a small country, then, a Home monopolist produces the same quantity and charges the same price as a perfectly competitive industry. The reason for this result is that free trade for a small country eliminates the monopolist's control over price, that is, its market power.

1 Tariffs and Quotas with Home Monopoly

Effect of a Home Tariff

FIGURE 9-3 (1 of 2) Tariff with Home Monopoly



Initially, under free trade at the fixed world price P^W , the monopolist faces the horizontal demand curve (and marginal revenue curve) X^* , and profits are maximized at point B .

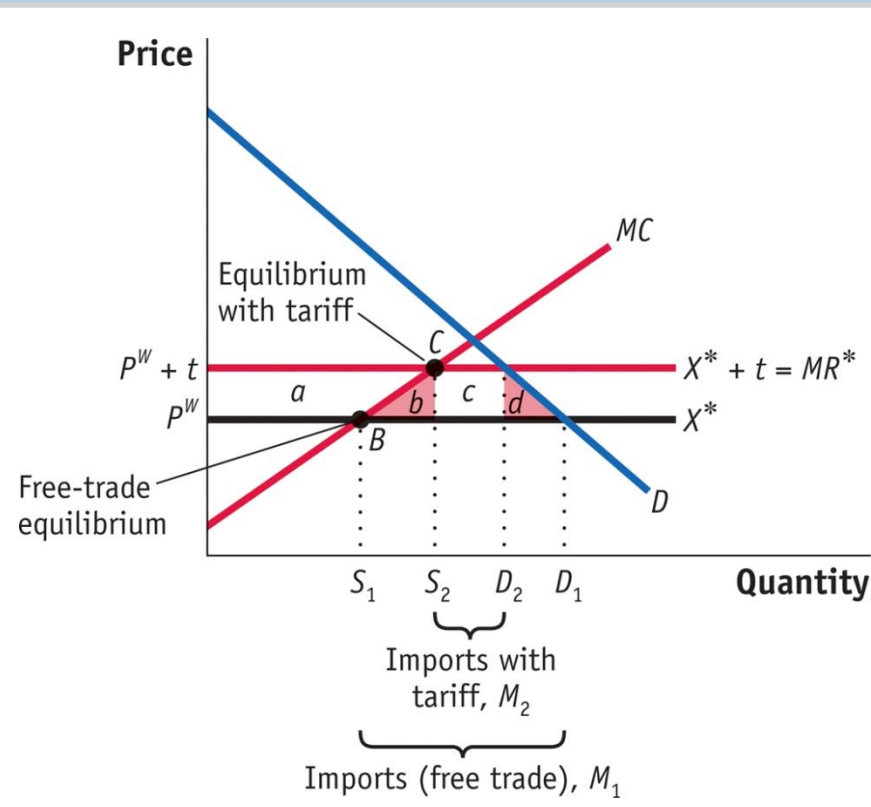
When a tariff t is imposed, the export supply curve shifts up since Foreign firms must charge $P^W + t$ in the Home market to earn P^W . This allows the Home monopolist to increase its domestic price to $P^W + t$, but no higher, since otherwise it would lose all of its customers to imports.

Comparison with Perfect Competition Because the monopolist has limited control over its price, it behaves in the same way a competitive industry would when facing the tariff.

1 Tariffs and Quotas with Home Monopoly

Effect of a Home Tariff

FIGURE 9-3 (2 of 2) Tariff with Home Monopoly (continued)



The result is fewer imports, M_2 , because Home supply S increases and Home demand D decreases. The deadweight loss of the tariff is measured by the area $(b + d)$. This result is the same as would have been obtained under perfect competition because the Home monopolist is still charging a price equal to its marginal cost.

Home Loss Due to the Tariff

Fall in consumer surplus: $-(a + b + c + d)$

Rise in producer surplus: $+a$

Rise in government revenue: $+c$

Net effect on Home welfare: $-(b + d)$

1 Tariffs and Quotas with Home Monopoly

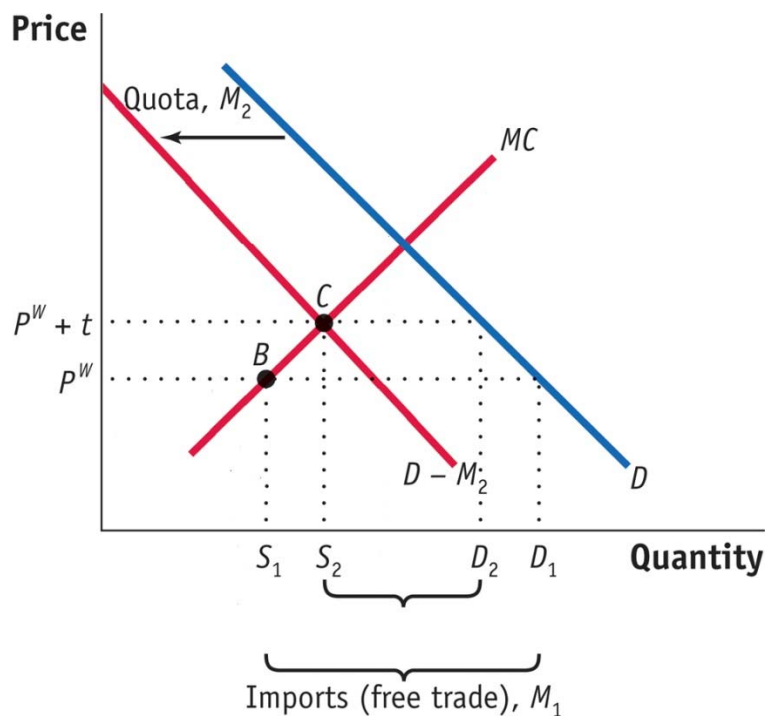
Effect of a Home Quota

- Now we can look at the effect of a quota and compare it to the effect of a tariff.
- The quota will end up with higher prices for Home consumers since it allows the monopolist to keep its market power, which we know leads to higher prices.
- This is another reason why the WTO has encouraged countries to replace quotas with tariffs.

1 Tariffs and Quotas with Home Monopoly

Effect of a Home Quota

FIGURE 9-4 (1 of 2) Effect of Quota with Home Monopoly



Under free trade, the Home monopolist produces at point B and charges the world price of P^W .

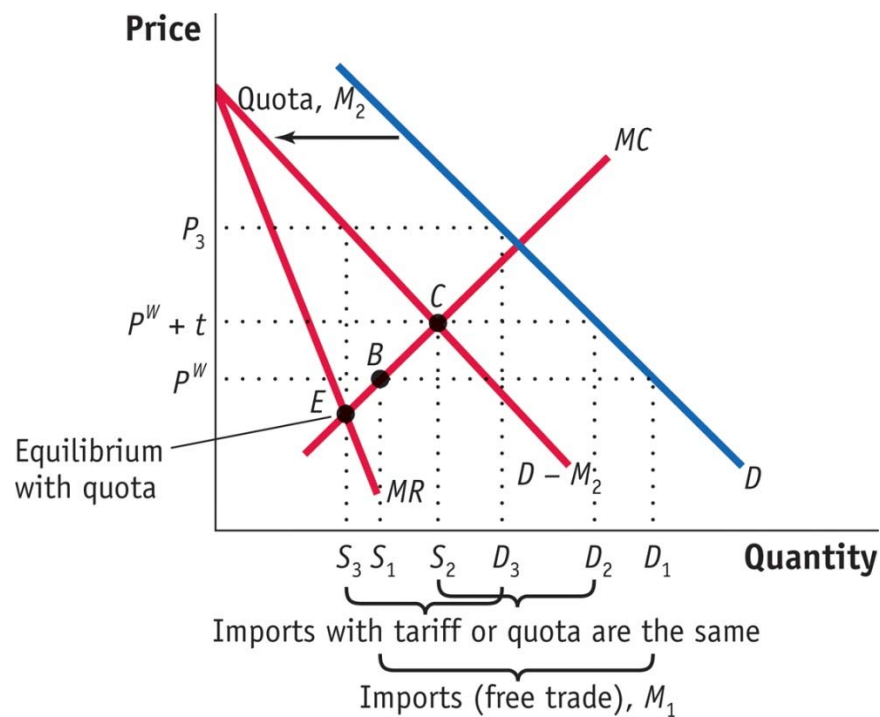
With a tariff of t , the monopolist produces at point C and charges the price of $P^W + t$. Imports under the tariff are $M_2 = D_2 - S_2$.

Under a quota of M_2 , the demand curve shifts to the left by that amount, resulting in the demand $D - M_2$ faced by the Home monopolist. That is, after M_2 units are imported, the monopolist is the only firm able to sell at Home, and so it can choose a price anywhere along the demand curve $D - M_2$.

1 Tariffs and Quotas with Home Monopoly

Effect of a Home Quota

FIGURE 9-4 (2 of 2) Effect of Quota with Home Monopoly (continued)



The marginal revenue curve corresponding to $D - M_2$ is MR , and so with a quota, the Home monopolist produces at point E , where MR equals MC .

The price charged at point E is $P_3 > P^W + t$, so the quota leads to a higher Home price than the tariff.

Home Loss Due to the Quota With an import quota, the Home firm is able to charge a higher price than it could with a tariff because it enjoys a “sheltered” market. So the import quota leads to higher costs for Home consumers than the tariff.

APPLICATION

U.S. Imports of Japanese Automobiles

- A well-known case of a “voluntary” export restraint (VER) for the United States occurred during the 1980s, when the U.S. limited the imports of cars from Japan.
- A recession led to less spending on durable goods (such as automobiles), and as a result, unemployment in the auto industry rose sharply.
- In 1980, the United Automobile Workers and Ford Motor Company applied to the International Trade Commission (ITC) for protection under Article XIX of GATT and Section 201 of U.S. trade laws.

APPLICATION

U.S. Imports of Japanese Automobiles

- The ITC determined that the recession was a more important cause of injury to the auto industry than increased imports. It did not recommend that the auto industry receive protection.
- In response, several congressmen with auto plants in their states pursued other means. A bill was introduced in the U.S. Senate to restrict imports.
- Aware of its potential consequences, the Japanese government announced it would “voluntarily” limit Japan’s export of autos to the U.S.
- By 1988, Japanese exports were below the VER because Japanese firms were producing their cars in the U.S.

APPLICATION

U.S. Imports of Japanese Automobiles

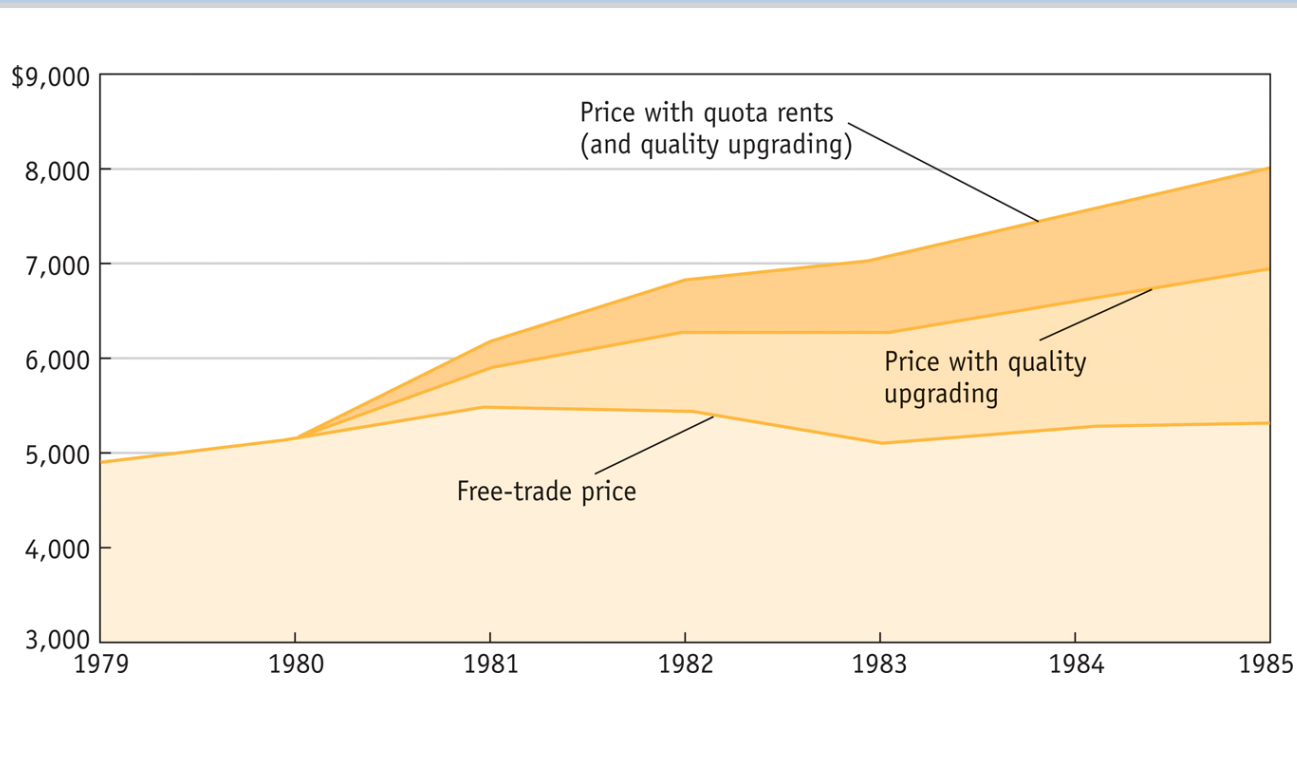
- Under the VER, the average price of U.S. cars rose very rapidly—43% increase from 1979 to 1981.
- This was due to the exercise of market power by the U.S. producers, who were sheltered by the quota.
- The quality of U.S. cars did not rise by as much as the quality of Japanese imports seen in Figure 9.5.
- The fact that the U.S. and Japanese firms were both able to raise prices substantially indicates that the policy was very costly to U.S. consumers.

APPLICATION

U.S. Imports of Japanese Automobiles

Price and Quality of Imports

FIGURE 9-5 (1 of 2) Prices of Japanese Car Imports



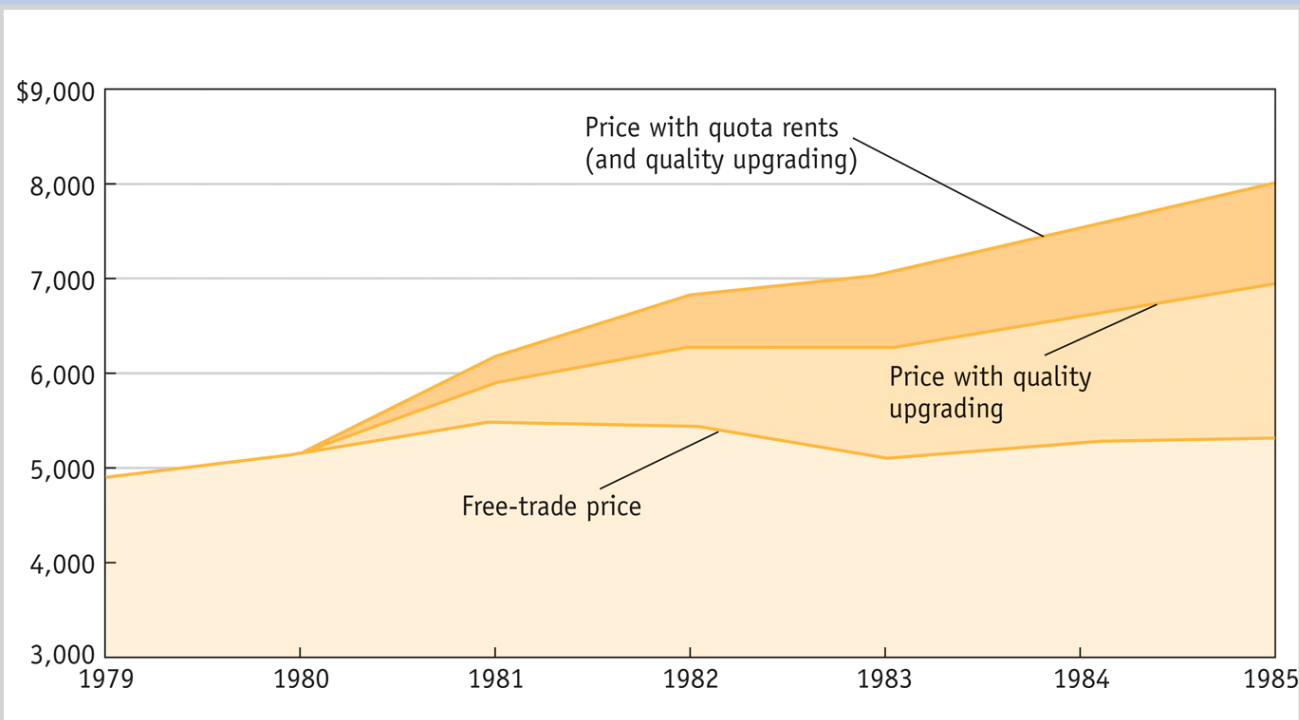
Under the “voluntary” export restraint (VER) on Japanese car imports, the average price rose from \$5,150 to \$8,050 between 1980 and 1985. Of that \$2,900 increase, \$1,100 was the result of quota rent increases earned by Japanese producers.

APPLICATION

U.S. Imports of Japanese Automobiles

Price and Quality of Imports

FIGURE 9-5 (2 of 2) Prices of Japanese Car Imports (continued)



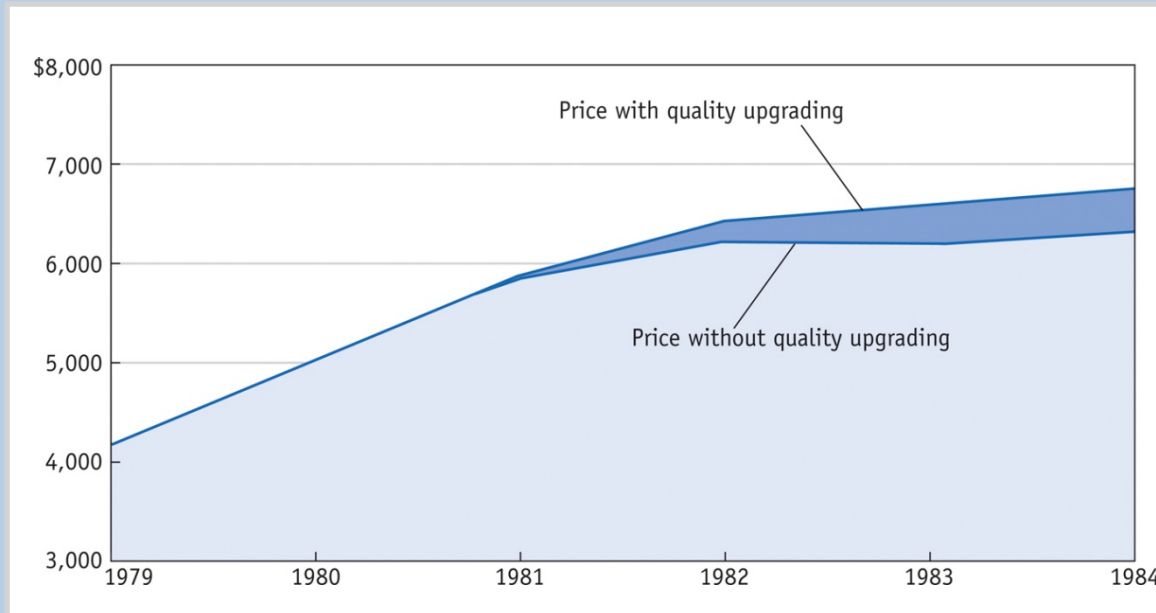
Another \$1,650 was the result of quality improvements in the Japanese cars, which became heavier and wider, with improved horsepower, transmissions, and so on. The remaining \$150 is the amount that import prices would have risen under free trade.

APPLICATION

U.S. Imports of Japanese Automobiles

Quota Rents, Price of U.S. Cars, The GATT and WTO

FIGURE 9-6



Prices of American Small Cars

Under the VER on Japanese car imports the average price of U.S. cars rose very rapidly when the quota was first imposed: from \$4,200 in 1979 to \$6,000 in 1981, or a 43% increase over two years.

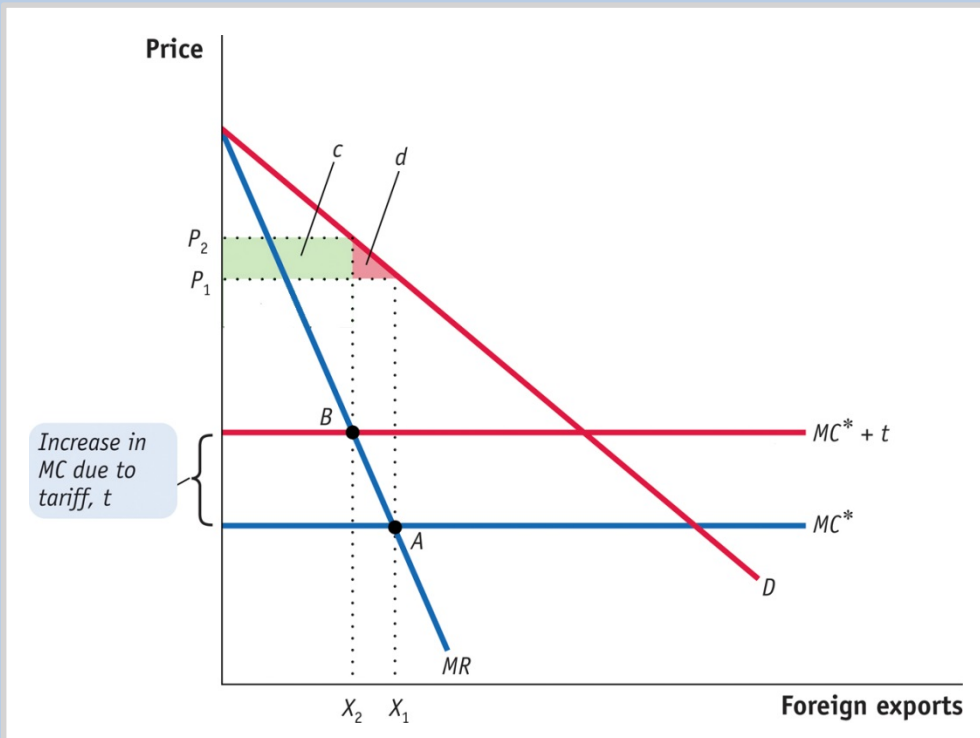
Only a very small part of that increase was explained by quality improvements, and in the later years of the quota, U.S. quality did not rise by as much as it did in the Japanese imports.

2 Tariffs with Foreign Monopoly

Foreign Monopoly

Free-Trade Equilibrium, Effect of a Tariff on Home Price

FIGURE 9-7 (1 of 2) Tariff with a Foreign Monopoly



Under free trade Foreign monopolist charges prices P_1 and exports X_1 , where marginal revenue MR equals marginal cost MC^* .

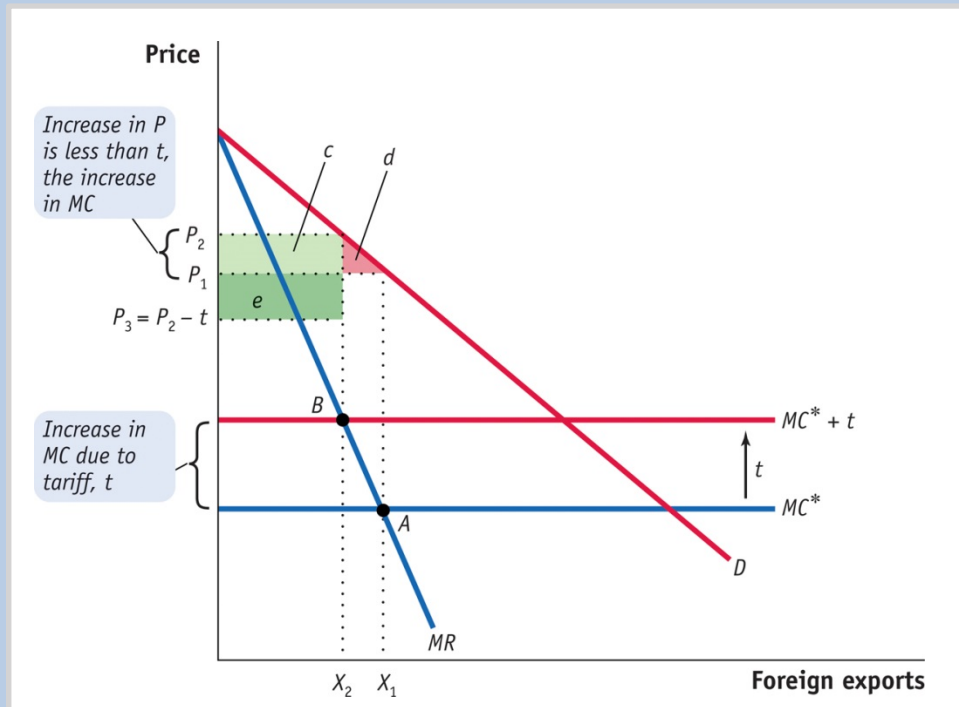
When an antidumping duty of t is applied, the firm's marginal cost rises to $MC^* + t$, so the exports fall to X_2 and the Home price rises to P_2 . The decrease in consumer surplus is shown by the area $c + d$, of which c is collected as a portion of tax revenues.

2 Tariffs with Foreign Monopoly

Foreign Monopoly

Free-Trade Equilibrium and Effect of a Tariff on Home Price

FIGURE 9-7 (2 of 2) Tariff with a Foreign Monopoly (continued)



The net-of-tariff price that the Foreign exporter receives falls to $P_3 = P_2 - t$. Because the net-of-tariff price has fallen, the Home country has a terms-of-trade gain, area e . Thus, the total welfare change depends on the size of the terms-of-trade gain e relative to the deadweight loss d .

Effect of the Tariff on Home Welfare

Fall in Home consumer surplus: $-(c + d)$

Rise in Home government revenue: $+(c + e)$

Net change in Home welfare: $+(e - d)$

APPLICATION

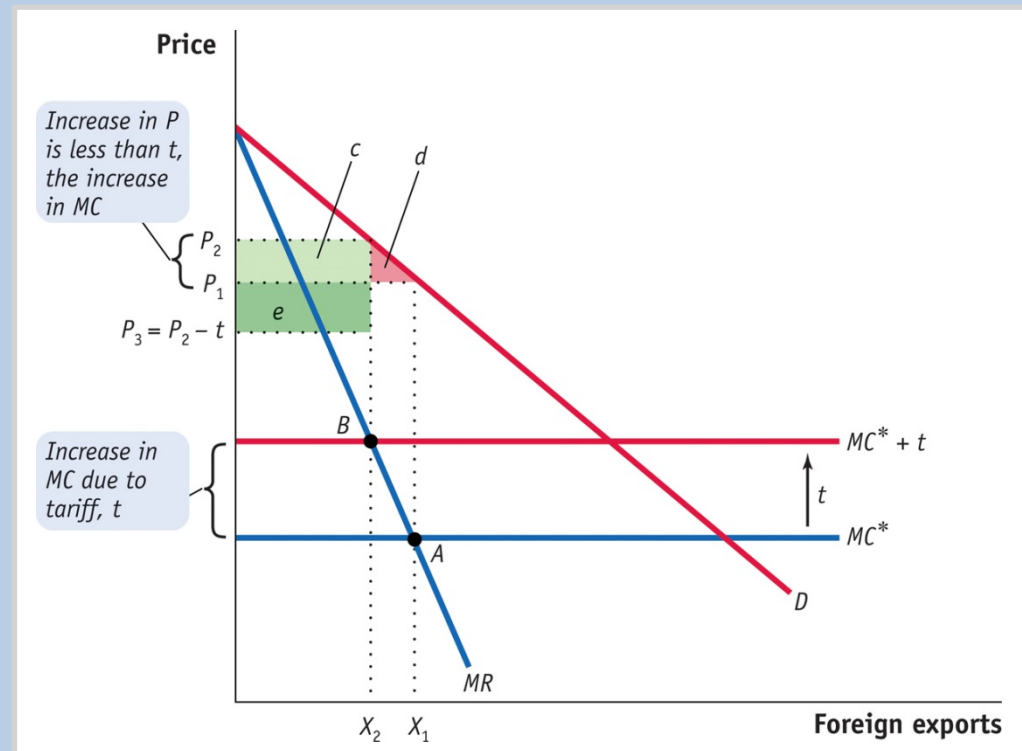
Import Tariffs on Japanese Trucks

- We just learned that a tariff on a Foreign monopolist can have a positive terms-of-trade effect for the Home country.
- To what extent do Foreign exporters behave in ways that benefit the Home country?
- Here, we take a look at the effects of a 25% tariff on imported Japanese compact trucks imposed by the U.S. in the early 1980s, and still in place today.

APPLICATION

Import Tariffs on Japanese Trucks

FIGURE 9-7 (revisited)



If the terms of trade gain, measured by the area e in Figure 9-7 exceed the deadweight loss d , then the Home country gains from the tariff.

This is our first example of strategic trade policy that leads to a potential gain for Home.

In principle, this potential gain arises from the tariff that the United States has applied on imports of compact trucks, and that is still in place today.

APPLICATION

Import Tariffs on Japanese Trucks

- Some economists feel that this tariff has the undesirable side effect of encouraging the U.S. automobile industry to focus on the sales of trucks, since compact trucks have higher prices due to the tariff.
- That strategy by U.S. producers can work when gasoline prices are low, so consumers are willing to buy trucks. At times of high prices, however, consumers instead want fuel-efficient cars.
- So high fuel prices can lead to a surge in imports and fewer domestic sales.

HEADLINES

The Chickens Have Come Home to Roost

In 1962, when implementing the European Common Market, the Community denied access to U.S. chicken producers.

The U.S. responded with retaliatory tariffs that included a twenty-five percent tariff on trucks aimed at the German Volkswagen Combi-Bus that was enjoying brisk sales in the U.S.

Since the trade (GATT) rules required that retaliation be applied on a nondiscriminatory basis, the tariffs were levied on all truck-type vehicles imported from all countries and have never been removed.

As a result, the big three U.S. automobile companies, have basically specialized in building trucks.

3 Dumping

- With international trade not only can firms charge a price that is higher than their marginal cost, they can also choose to charge different prices in their domestic market as compared with their export market.
- This pricing strategy is called **price discrimination** because the firm is able to choose how much different groups of customers pay.

3 Dumping

J.Baker1

Discriminating Monopoly

We assume that the monopolist is able to charge different prices in the two markets; this market structure is sometimes called a discriminating monopoly.

Equilibrium Condition

For the discriminating monopoly, profits are maximized when the following condition holds:

$$MR = MR^* = MC^*$$

Slide 28

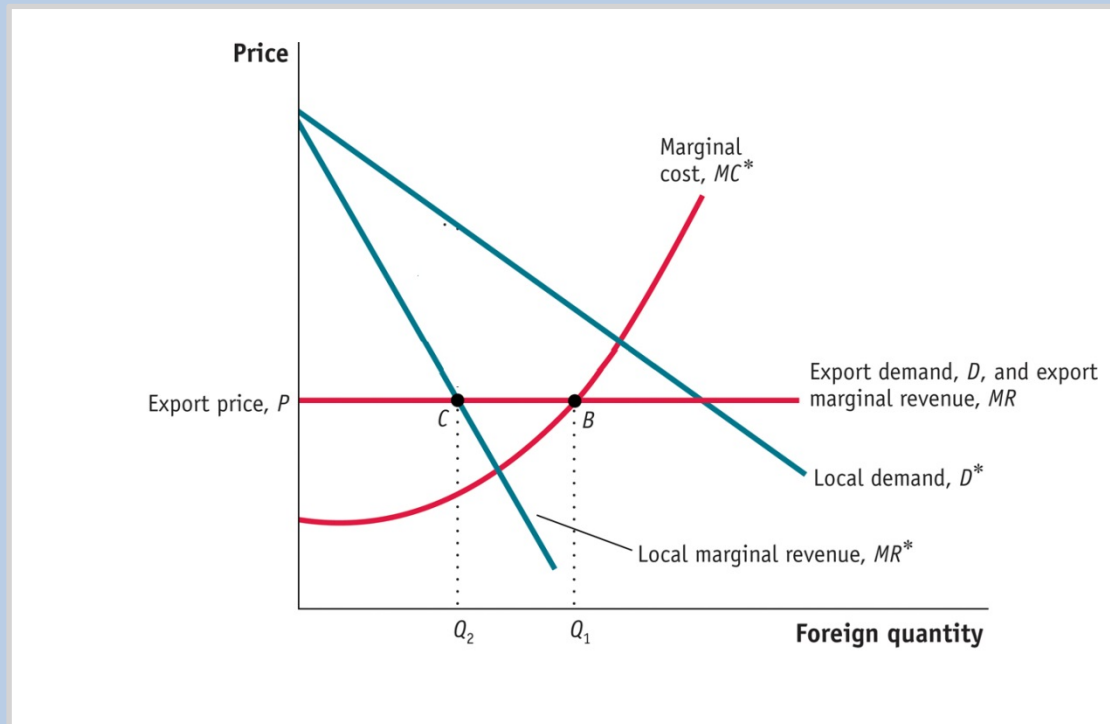
J.Baker1

Removed Effect of a Tariff b-head (here and on previous slide) since it does not correlate to this section of the book. Maintained c-heads consistent with PDF.

JNB, 7/16/2014

3 Dumping

FIGURE 9-8 (1 of 2) Foreign Discriminating Monopoly



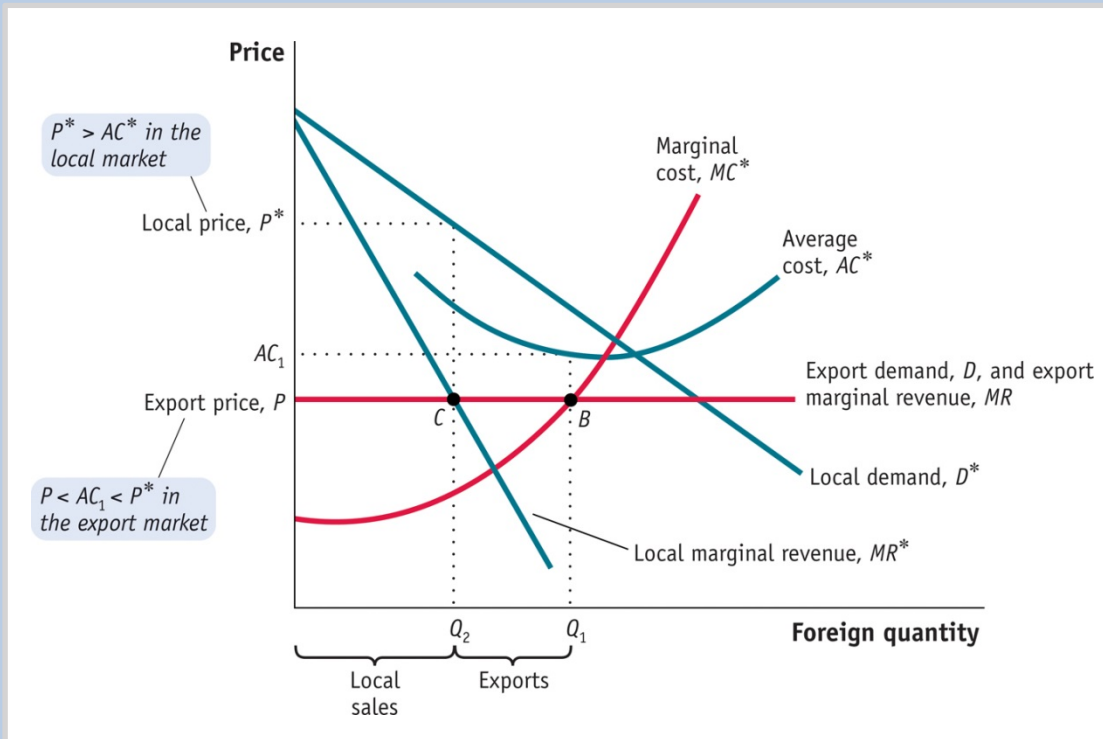
The Foreign monopoly faces different demand curves and charges different prices in its local and export markets. Locally, its demand curve is D^* with marginal revenue MR^* .

Abroad, its demand curve is horizontal at the export price P , which is also its marginal revenue of MR .

To maximize profits, the Foreign monopolist chooses to produce the quantity Q_1 at point B , where local marginal cost equals marginal revenue in the export market, $MC^* = MR$.

3 Dumping

FIGURE 9-8 (2 of 2) Foreign Discriminating Monopoly (continued)



The quantity sold in the local market, Q_2 (at point C), is determined where local marginal revenue equals export marginal revenue, $MR^* = MR$.

The Foreign monopolist sells Q_2 to its local market at P^* , and $Q_1 - Q_2$ to its export market at P .

Because $P < P^*$ (or alternatively $P < AC_1$), the firm is dumping.

3 Dumping

Numerical Example of Dumping

Suppose the Foreign firm has the following cost and demand data:

Fixed costs	=	\$100
Marginal costs	=	\$10 per unit
Local price	=	\$25
Local quantity	=	10
Export price	=	\$15
Export quantity	=	10

The profits earned from selling in its local market are

$$\underbrace{(\$25 \cdot 10)}_{\text{Revenue}} - \underbrace{\$10 \cdot 10}_{\text{Variable cost}} - \underbrace{\$100}_{\text{Fixed cost}} = \underbrace{\$50}_{\text{Profits}}$$

Notice that the average costs for the firms are

$$\text{Average costs} = \frac{\$200}{10} = \$20$$

Now suppose that this firm sells an additional 10 units abroad, at the price of \$15, which is less than its average cost of production. It is *still* worthwhile to sell these extra units because profits become

$$\underbrace{(\$25 \cdot 10 + \$15 \cdot 10)}_{\text{Revenue}} - \underbrace{\$10 \cdot 20}_{\text{Variable cost}} - \underbrace{\$100}_{\text{Fixed cost}} = \underbrace{\$100}_{\text{Profits}}$$

4 Policy Response to Dumping

Antidumping Duties

- Under the rules of the WTO, an importing country is entitled to apply an antidumping tariff any time that a foreign firm is dumping its product.
- An imported product is being dumped if its price is below the price that the exporter charges in its own local market.
- An example of an antidumping duty is the tariff that the European Union applies to imports of shoes from China and Vietnam.

APPLICATION

United States Imports of Solar Panels from China

- Since November 2012, the United States has applied antidumping duties on the imports of solar panels from China.
- In addition to the antidumping duties, another tariff—called a **countervailing duty**—has been applied against imports of solar panels from China.
- A countervailing duty is used when the Foreign government subsidizes its own exporting firms so that they can charge lower prices for their exports.
- Not all American producers supported tariffs on Chinese solar Panels, however, because they raised costs for firms such as SolarCity Corp., which finances and installs rooftop solar systems.

4 Policy Response to Dumping

Antidumping Duties

Strategic Trade Policy?

- Does the application of antidumping duties lead to a terms-of-trade gain for the Home country, making this another example of strategic trade policy that can potentially benefit the Home country?
- In the upcoming analysis, we'll find that the answer to this question is “no,” and that the antidumping provisions of U.S. trade law are *overused* and create a much greater cost for consumers and larger deadweight losses than does the less frequent application of tariffs under the safeguard provision, Article XIX of the GATT.

4 Policy Response to Dumping

Antidumping Duties

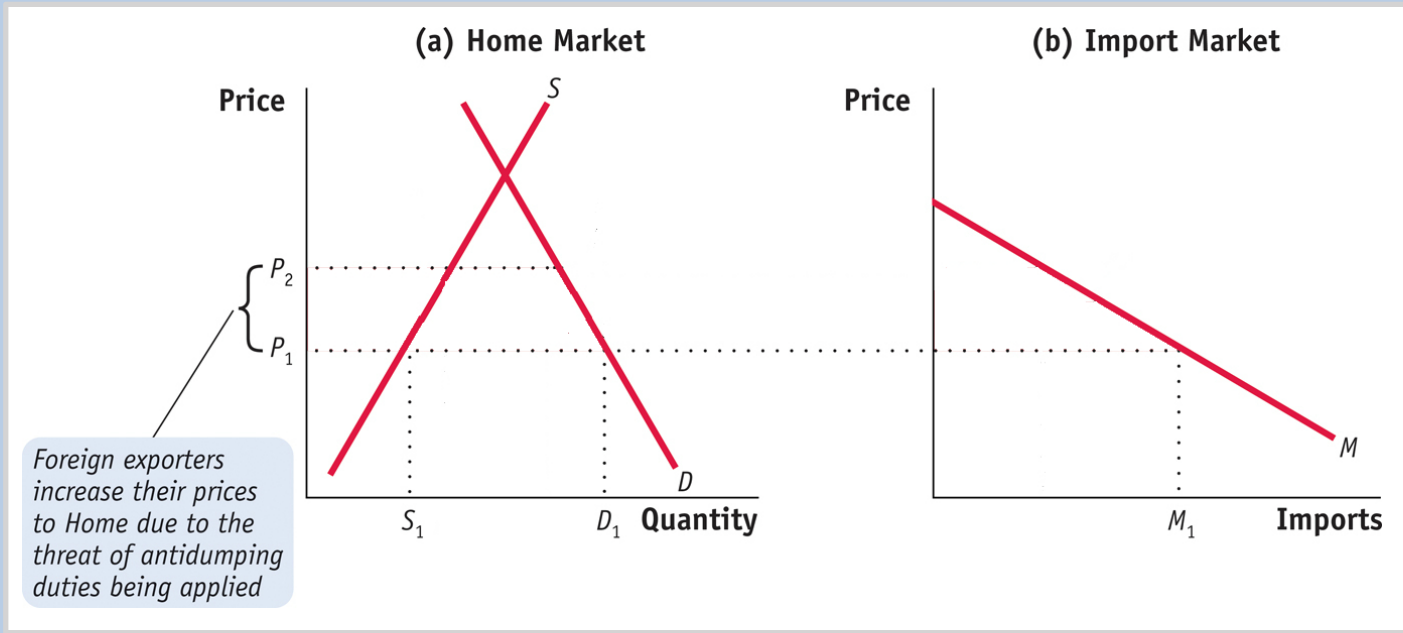
Comparison with Safeguard Tariff

It is important to recognize that the tariff on compact trucks, discussed in the previous application (Import Tariffs on Japanese Trucks), was not an antidumping duty. Rather, it was a **safeguard tariff** applied under Section 201 of the U.S. tariff code, or Article XIX of the GATT.

4 Policy Response to Dumping

Calculation of Antidumping Duty

FIGURE 9-9 (1 of 2) Home Loss Due to Threat of Duty

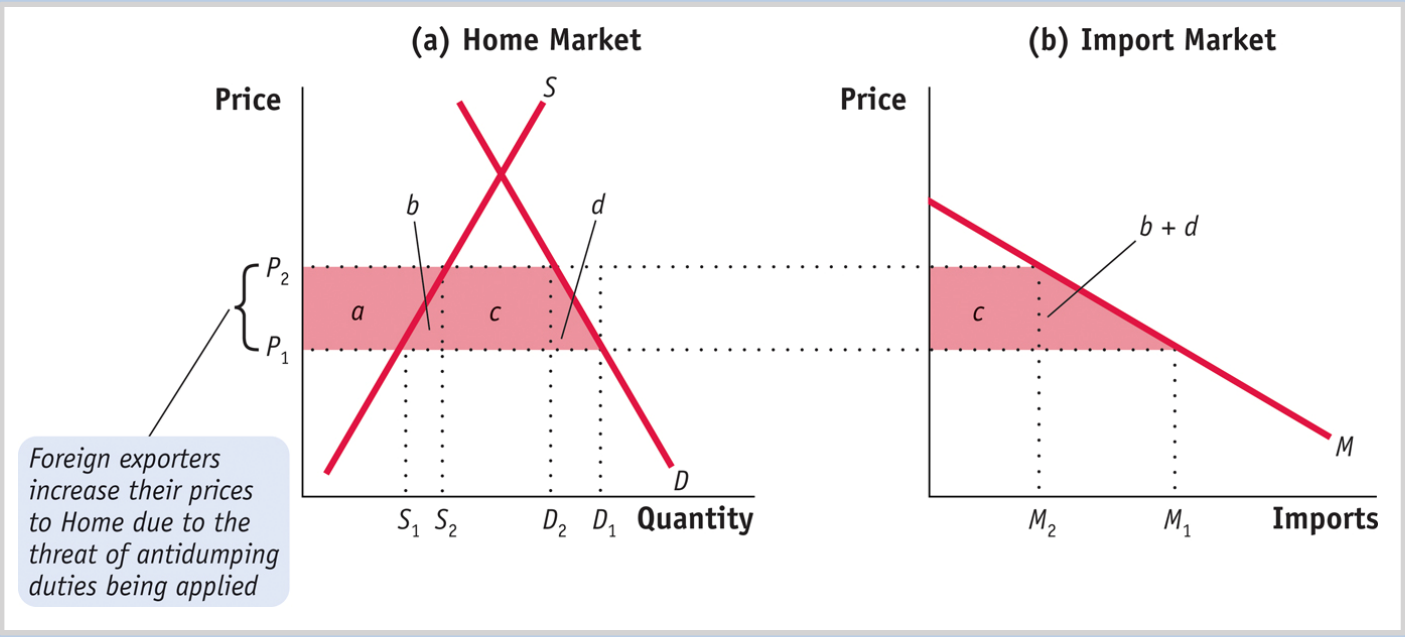


A charge of dumping can sometimes lead Foreign firms to increase their prices, even without an antidumping duty being applied.

4 Policy Response to Dumping

Calculation of Antidumping Duty

FIGURE 9-9 (2 of 2) Home Loss Due to Threat of Duty (continued)



In that case, there is a loss for Home consumers ($a + b + c + d$) and a gain for Home producers (a). The net loss for the Home country is area ($b + c + d$).

APPLICATION

Antidumping Duties Versus Safeguard Tariffs

In Chapter 8 we discussed the “safeguard” provision of GATT and Section 201 of U.S. trade law.

- This provision, which allows for temporary tariffs to be applied, is used infrequently.
- Of the 31 cases filed from 1980 to 2009, the ITC made a negative recommendation (i.e., it did not approve the requests).
- One of those negative recommendations was for the tariff on Japanese compact trucks discussed in the previous application.
- The ITC made a negative recommendation for both cars and trucks in 1980, but trucks still obtained a tariff by reclassifying the type of trucks being imported.
- The ITC made an affirmative ruling for protection in 12 cases, which then went for a final ruling to the president, who recommended import protection in only nine cases.

APPLICATION

Antidumping Duties Versus Safeguard Tariffs

TABLE 9-1

Import Protection Cases in the United States, 1980-2011 This table shows the use of safeguard tariffs as compared with antidumping duties and countervailing duties in the United States. Safeguard tariffs are used much less often.

Safeguard or Escape Clause Cases			TOTAL 1980-2011		
Total 1980-1989	Total 1990-1999	Total 2000-2011	Negative ITC Ruling	Affirmative ITC Ruling*	Affirmative U.S. President Decision
19	9	3	16	12	9
China-Specific Safeguard Cases			TOTAL 1980-2011		
Total 1980-1989	Total 1990-1999	Total 2000-2011	Negative ITC Ruling	Affirmative ITC Ruling	Affirmative U.S. President Decision
NA	NA	7	2	5	1
Antidumping Cases			TOTAL 1980-2011		
Total 1980-1989	Total 1990-1999	Total 2000-2011	Duty Levied	Case Rejected	Cases Withdrawn
468	428	332	548	456	148

5 Infant Industry Protection

There are two cases in which infant industry protection is potentially justified.

- First, protection may be justified if a tariff today leads to an increase in Home output that, in turn, helps the firm learn better production techniques and reduce costs in the future.
- A second case in which import protection is potentially justified is when a tariff in one period leads to an increase in output and reductions in future costs *for other firms in the industry*, or even for firms in other industries. This type of **externality** occurs when firms learn from each other's successes.

5 Infant Industry Protection

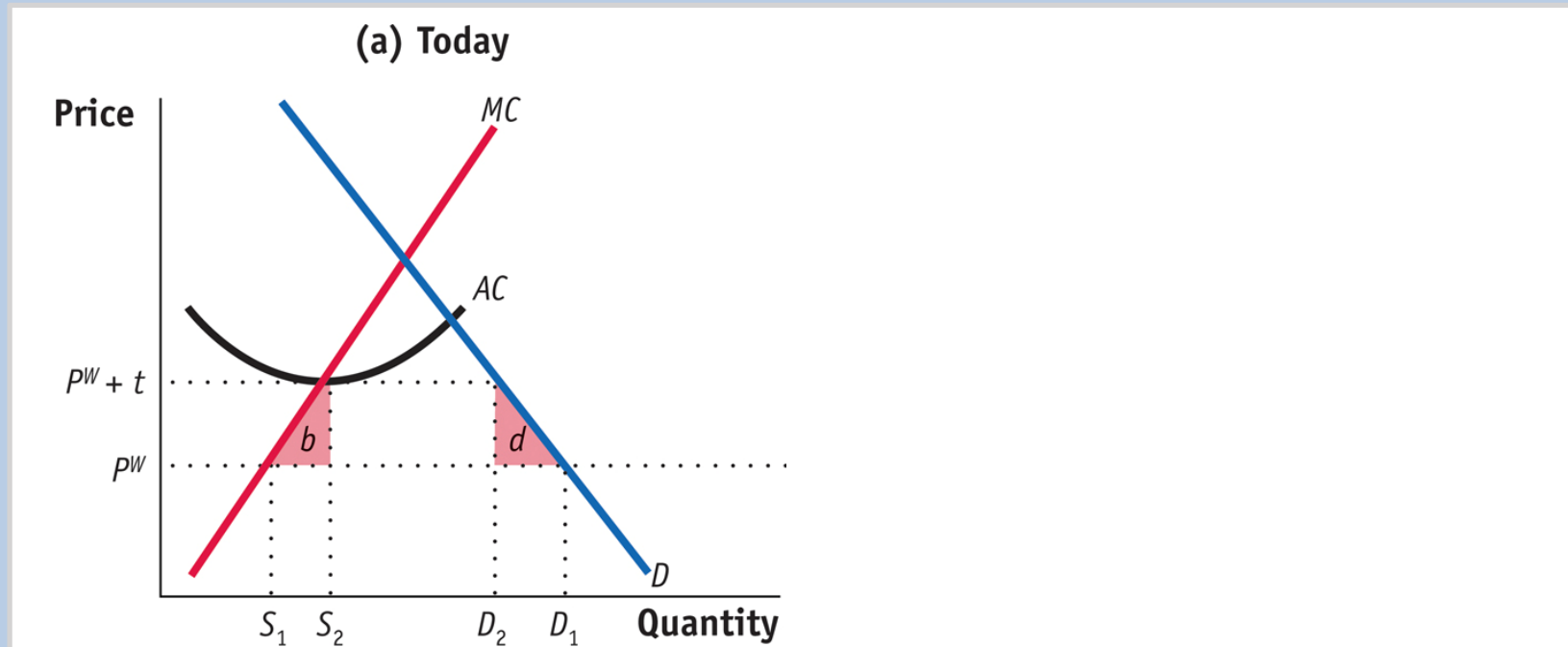
- In the semiconductor industry, it is not unusual for firms to mimic the successful innovations of other firms, and benefit from a **knowledge spillover**.
- As both of these cases show, the infant industry argument supporting tariffs or quotas depends on the existence of some form of **market failure**.

5 Infant Industry Protection

Free-Trade Equilibrium, Tariff Equilibrium

Equilibrium Today, Equilibrium in the Future, Effect of the Tariff on Welfare

FIGURE 9-10 (1 of 2) Infant Industry Protection



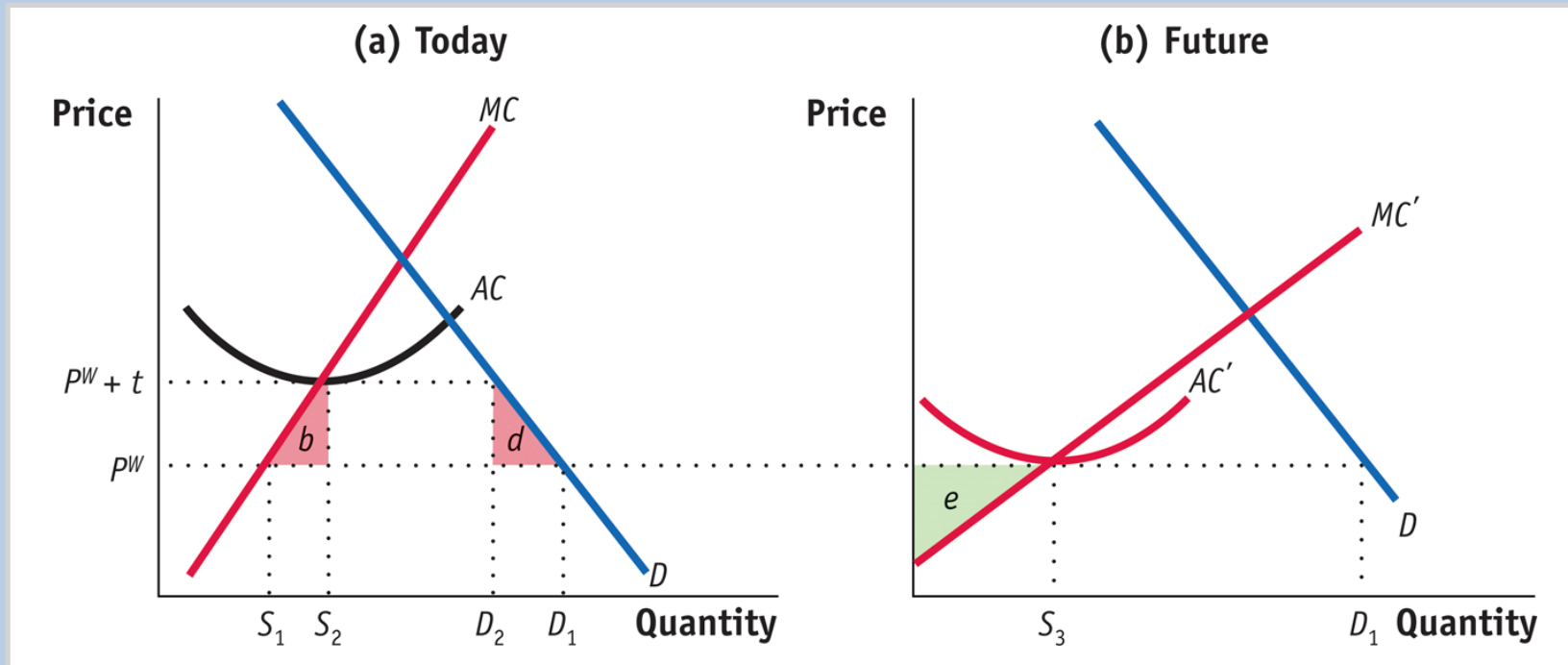
In the situation today (panel a), the industry would produce S_1 , the quantity at which $MC = P^W$. Because P^W is less than average costs at S_1 , the industry would incur losses at the world price of P^W and would be forced to shut down. A tariff increases the price from P^W to $P^W + t$, allowing the industry to produce at S_2 (and survive) with the net loss in welfare of $(b + d)$.

5 Infant Industry Protection

Free-Trade Equilibrium, Tariff Equilibrium

Equilibrium Today, Equilibrium in the Future, Effect of the Tariff on Welfare

FIGURE 9-10 (2 of 2) Infant Industry Protection (continued)



In panel (b), producing today allows the average cost curve to fall through learning to AC' . In the future, the firm can produce the quantity S_3 at the price P^W without tariff protection and earn producer surplus of e .

APPLICATION

Examples of Infant Industry Protection

Government Policies in the Solar Panel Industry

- In the United States, the government gives tax breaks and low interest loans or loan guarantees to companies that produce solar panels.
- One example of a loan guarantee was to the U.S. company Solyndra, which received a \$535 million loan guarantee from the U.S. Department of Energy in 2009.
- But Solyndra subsequently went bankrupt in 2011, and President Obama was widely criticized for this loan guarantee.
- This example illustrates how difficult it is to know whether a company protected by some form of infant industry protection will actually become profitable in the future.

APPLICATION

Examples of Infant Industry Protection

Government Policies in the Solar Panel Industry

- China has also pursued policies to encourage the production of solar panels, and especially to encourage their export.
- These infant industry policies are successful if:
 1. the industry becomes profitable in the future, after the export subsidy is removed; and
 2. the deadweight loss of the subsidy is less than the future profits earned by the industry.
- In China, the extensive use of subsidies led to vast overcapacity in the industry, which in turn led to the bankruptcy of the key Chinese firm, Suntech Power Holdings, whose main subsidiary in Beijing went bankrupt in March 2013.

HEADLINES

Solar Flares

This article discusses the solar energy industry in Europe, and a recent proposal by the European Union to impose antidumping duties against China.

- In September of 2012 the EU launched a probe into the billions of Euros of imported Chinese solar equipment.
- By May 2013 the EU trade commissioner proposed that duties averaging 47 percent be imposed on Chinese exports of solar panels, accusing the country of dumping into the European market.
- Many European producers fear these measures will backfire, increasing prices of solar equipment and further harming an industry already struggling in Europe.

APPLICATION

Examples of Infant Industry Protection

U.S. Tariff on Heavyweight Motorcycles

In 1983 Harley-Davidson, the legendary U.S.-based motorcycle manufacturer, was in trouble. Facing intense import competition, Harley-Davidson applied to the International Trade Commission (ITC) for Section 201 protection.

Calculation of Deadweight Loss The deadweight loss relative to import value in 1983 is measured as

$$\text{J.Baker2} \frac{DWL}{P^W \cdot M} = \frac{1}{2} \cdot \frac{t \cdot \Delta M}{P^W \cdot M} = \frac{1}{2} \cdot \left(\frac{t}{P^W} \right) \cdot \% \Delta M$$

$$\frac{DWL}{P^W \cdot M} = \frac{1}{2} (0.45 \cdot 0.17) = 0.038, \text{ or } 3.8\%$$

Reprinted by permission of the York
Daily Record/York Sunday News



Slide 47

J.Baker2

This equation is different from the one on the bottom of page 311 in the text for this subhead. Double check equations.

JNB, 7/16/2014

APPLICATION

Examples of Infant Industry Protection

U.S. Tariff on Heavyweight Motorcycles

Reprinted by permission of the York Daily Record/York Sunday News



TABLE 9-2

U.S. Imports of Heavyweight Motorcycles This table shows the effects of the tariff on imports of heavyweight motorcycles in the United States..

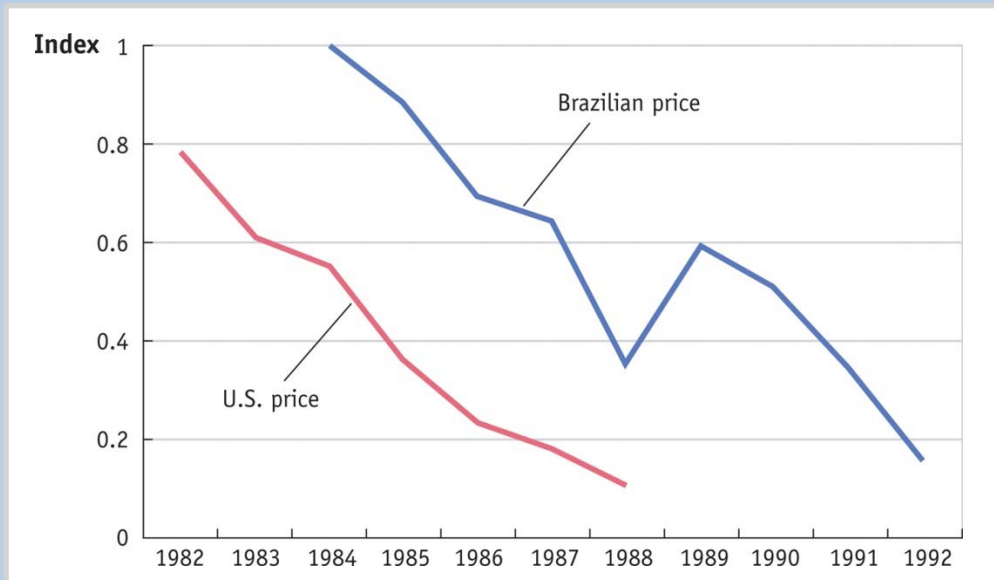
Year	Import Sales (\$ millions)	Import Quantity	% Fall in Imports (from 1982)	Tariff (%)	Net Loss/Average Sales (%)	Deadweight Loss (% millions)
1982	452	164,000				
1983	410	139,000	17	45	3.8	16.3
1984	179	80,000	69	35	12.1	38.4
1985	191	72,000	78	20	7.8	25.2
1986	152	43,000	116	15	8.7	26.4
January–March 1987	59	14,000	98	15	7.3	6.3
Total, 1983–1987						112.5

Future Gain in Producer Surplus To evaluate the future gains in producer surplus, we can examine the stock market value of the firm around the time that the tariff was removed. By this calculation, the future gain in producer surplus from tariff protection to Harley-Davidson (\$131 million) exceeds the deadweight loss of the tariff.

APPLICATION

Examples of Infant Industry Protection Computers in Brazil

FIGURE 9-11 (1 of 2) Computer Prices in the United States and Brazil, 1982-1992



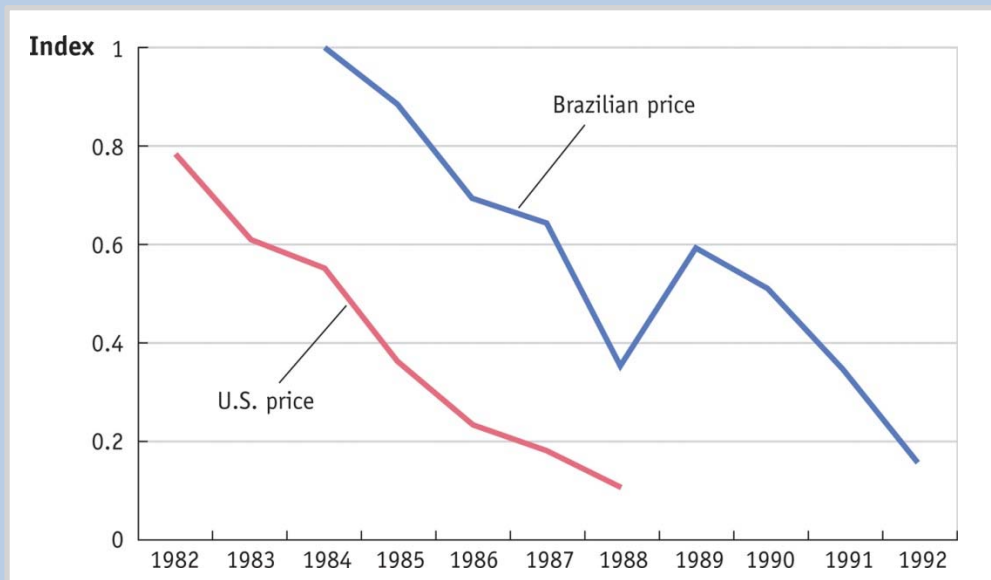
This diagram shows the effective price of computer power in the United States and Brazil. Both prices fell very rapidly due to technological improvements, but the drop in the U.S. price exceeded that of the Brazilian price.

There are many cases in which infant industry protection has not been successful. One well-known case involves the computer industry in Brazil.

APPLICATION

Examples of Infant Industry Protection Computers in Brazil

FIGURE 9-11 (2 of 2) Computer Prices in the United States and Brazil, 1982-1992



The difference between the two prices is a measure of the technology gap between Brazil and the United States in the production of personal computers.

Prices in Brazil The persistent gap between the prices in Brazil and the United States means that Brazil was never able to produce computers at competitive prices without tariff protection. This fact alone means that the infant industry protection was not successful.

APPLICATION

Examples of Infant Industry Protection

Computers in Brazil

Consumer and Producer Surplus

TABLE 9-3

Brazilian Computer Industry This table shows the effects of the government ban on imports of personal computers into Brazil.

Year	Sales (\$ millions)	Brazil/U.S. Price (%)	Producer Surplus Gain (\$ millions)	Consumer Surplus Loss (\$ millions)	Net Loss (\$ millions)	Net Loss (% of GDP)
1984	126	189	29	80	51	0.02
1985	384	159	70	179	109	0.04
1986	746	143	113	277	164	0.06
1987	644	119	50	112	62	0.02
1988	279	127	29	68	39	0.01

Other Losses The higher prices in Brazil imposed costs on Brazilian industries that relied on computers in manufacturing, as well as on individual users, and they became increasingly dissatisfied with the government's policy.

APPLICATION

Examples of Infant Industry Protection Protecting the Automobile Industry in China



In 2009 China overtook the United States as the largest automobile market in the world. Strong competition among foreign firms located in China, local producers, and import sales have resulted in new models and falling prices.

Production in China

- Beginning in the early 1980s, China permitted a number of joint ventures between foreign firms and local Chinese partners.
- Various regulations, combined with high tariff duties, helped at least some of the new joint ventures achieve success.



HEADLINES

Milestone for China Car Output

As of the publication of this article China was set to produce more cars than Europe for the first time in 2013. China was projected to produce 19.6 million cars and other light vehicles, such as trucks, compared to 18.3 million in Europe.

In 2012 China produced 17.8 million cars, which was more than a million cars behind Europe at 18.9 million cars.

The growth of automobile production in China has been remarkable. In 2013 China is projected to produce 10 times more cars than in 2000. Over this period China's share of global auto manufacturing has gone from 3.5% to 23.8%.

HEADLINES

Shanghai Tie-Up Drives Profits for GM

One in four GM cars is now made in China. Even those cars made in Detroit were partly designed in Shanghai.

In exchange for a deal to sell Chinese minicommercial vehicles in India, GM agreed to give up the 50-50 ownership of its leading mainland joint venture, Shanghai General Motors.

Will observers one day look back at that deal and say that was the day GM signed over its future to the Chinese?

Without China, GM probably cannot be saved at all, which is a remarkable reversal from a decade ago, when the Chinese auto industry was just getting on its feet and desperately needed GM investment.

APPLICATION

Examples of Infant Industry Protection Protecting the Automobile Industry in China



Cost to Consumers

Quotas have a particularly large impact on domestic prices when the Home firm is a monopoly. That situation applied to the sales of Volkswagen's joint venture, in Shanghai, which enjoyed a local monopoly on the sales of its vehicles.

Gains to Producers

For the tariffs and quotas used in China to be justified as infant industry protection, they should lead to a large enough drop in future costs so that the protection is no longer needed.

APPLICATION

Examples of Infant Industry Protection Protecting the Automobile Industry in China

FIGURE 9-12

Automobile Markups by Firms in China, 1995-2001 This diagram shows the percentage markups (price over marginal cost) applied to automobiles sold in China from 1995 to 2001, by various producers. The highest markup was charged by Shanghai Volkswagen, which had a local monopoly in Shanghai.

