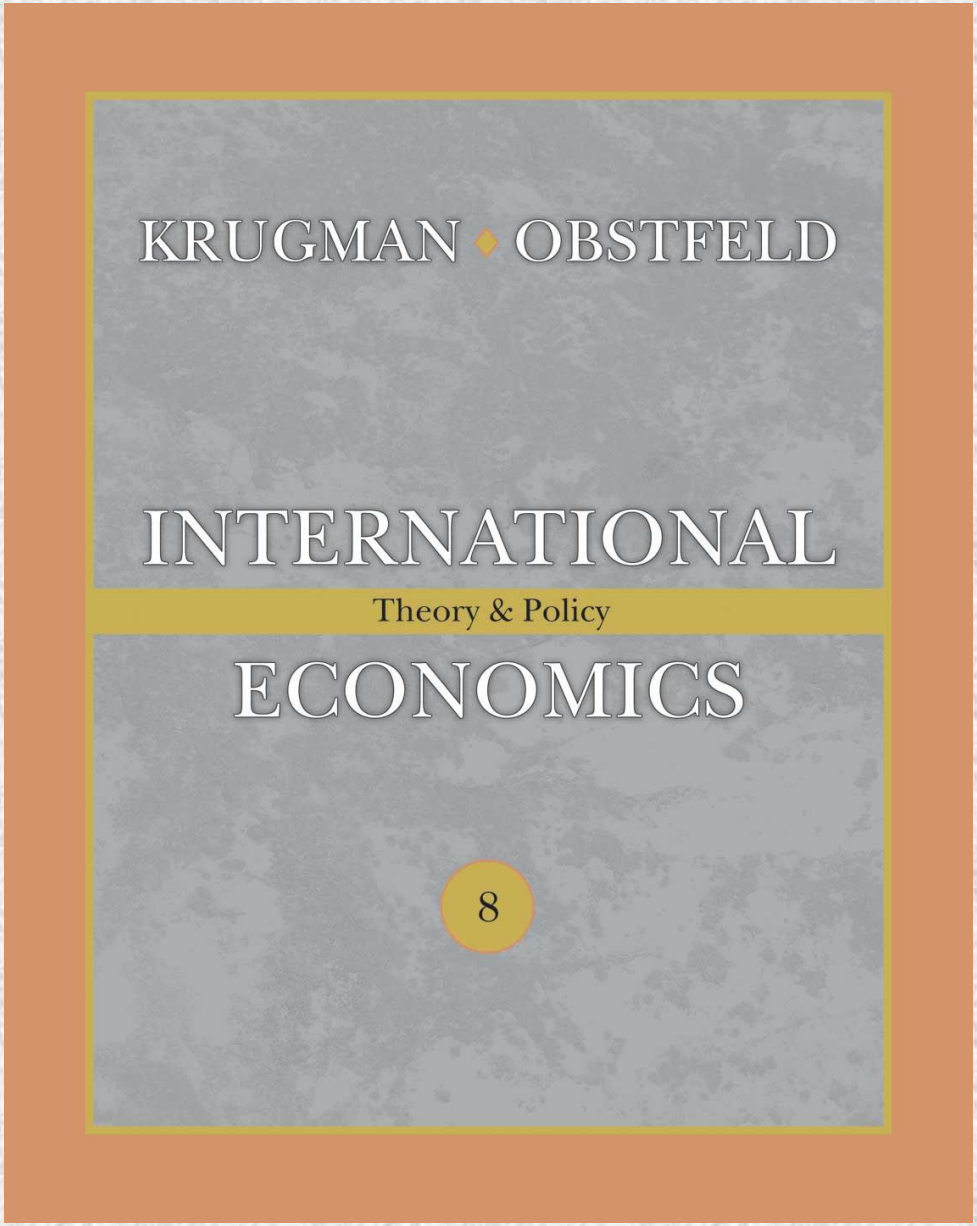


Chapter 8

The Instruments of Trade Policy

Slides prepared by Thomas Bishop

PEARSON Addison Wesley

Preview

- Partial equilibrium analysis of tariffs: supply, demand, and trade in a single industry
- Costs and benefits of tariffs
- Export subsidies
- Import quotas
- Voluntary export restraints
- Local content requirements

Types of Tariffs

- A **specific tariff** is levied as a fixed charge for each unit of imported goods.
  - For example, $1 per kg of cheese
- An **ad valorem tariff** is levied as a fraction of the value of imported goods.
  - For example, 25% tariff on the value of imported cars.
- Let's analyze how tariffs affect the economy.

Supply, Demand, and Trade in a Single Industry

- Let's construct a model measuring how a tariff affects a single market, say that of wheat.
- Suppose that in the absence of trade the price of wheat in the foreign country is lower than that in the domestic country.
  - With trade the foreign country will export: construct an export supply curve
  - With trade the domestic country will import: construct an import demand curve

Supply, Demand, and Trade in a Single Industry (cont.)

- An export supply curve is the difference between the quantity that foreign producers supply minus the quantity that foreign consumers demand, at each price.
- An import demand curve is the difference between the quantity that domestic consumers demand minus the quantity that domestic producers supply, at each price.

Fig. 8-1: Deriving Home's Import Demand Curve

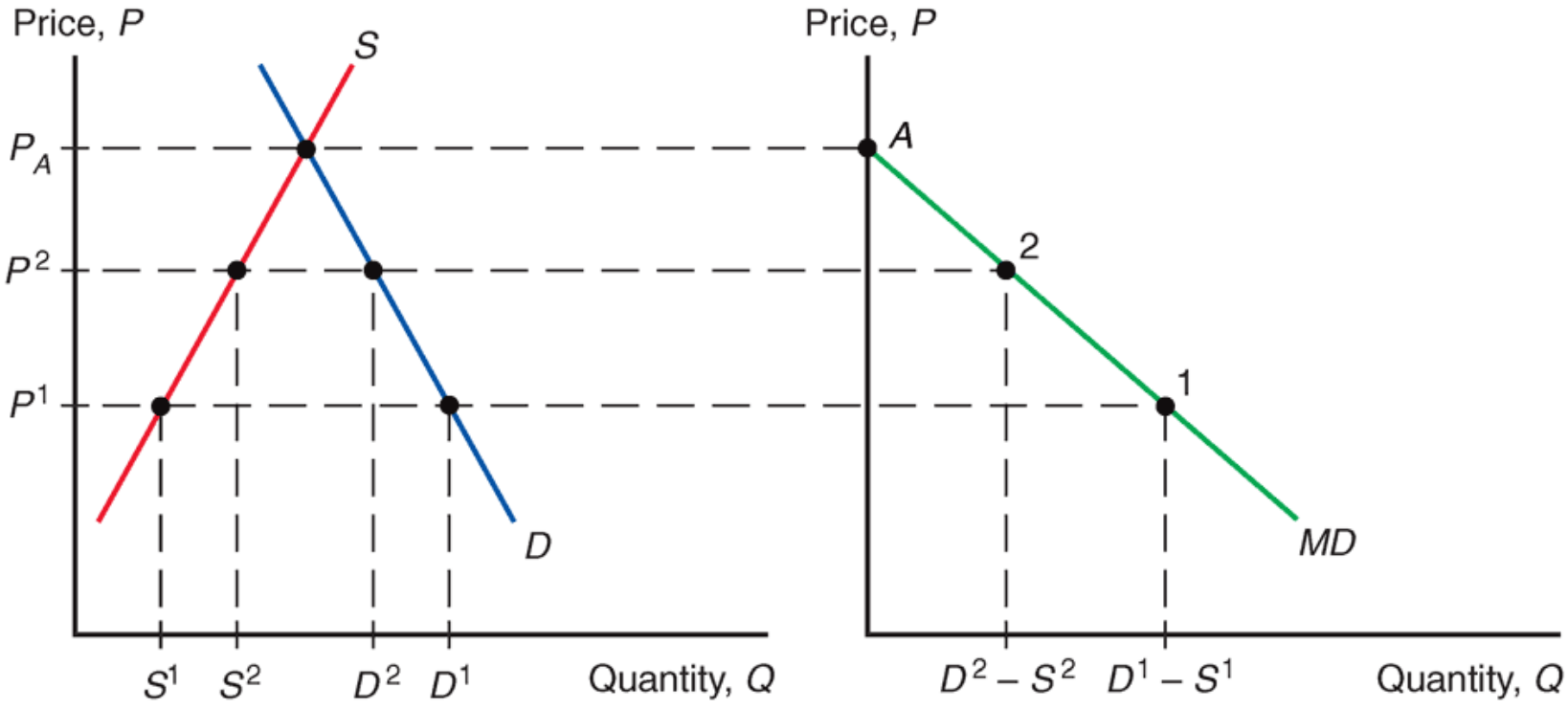


Fig. 8-2: Deriving Foreign's Export Supply Curve

Supply, Demand, and Trade in a Single Industry (cont.)

- In equilibrium, the quantities of

  import demand = export supply

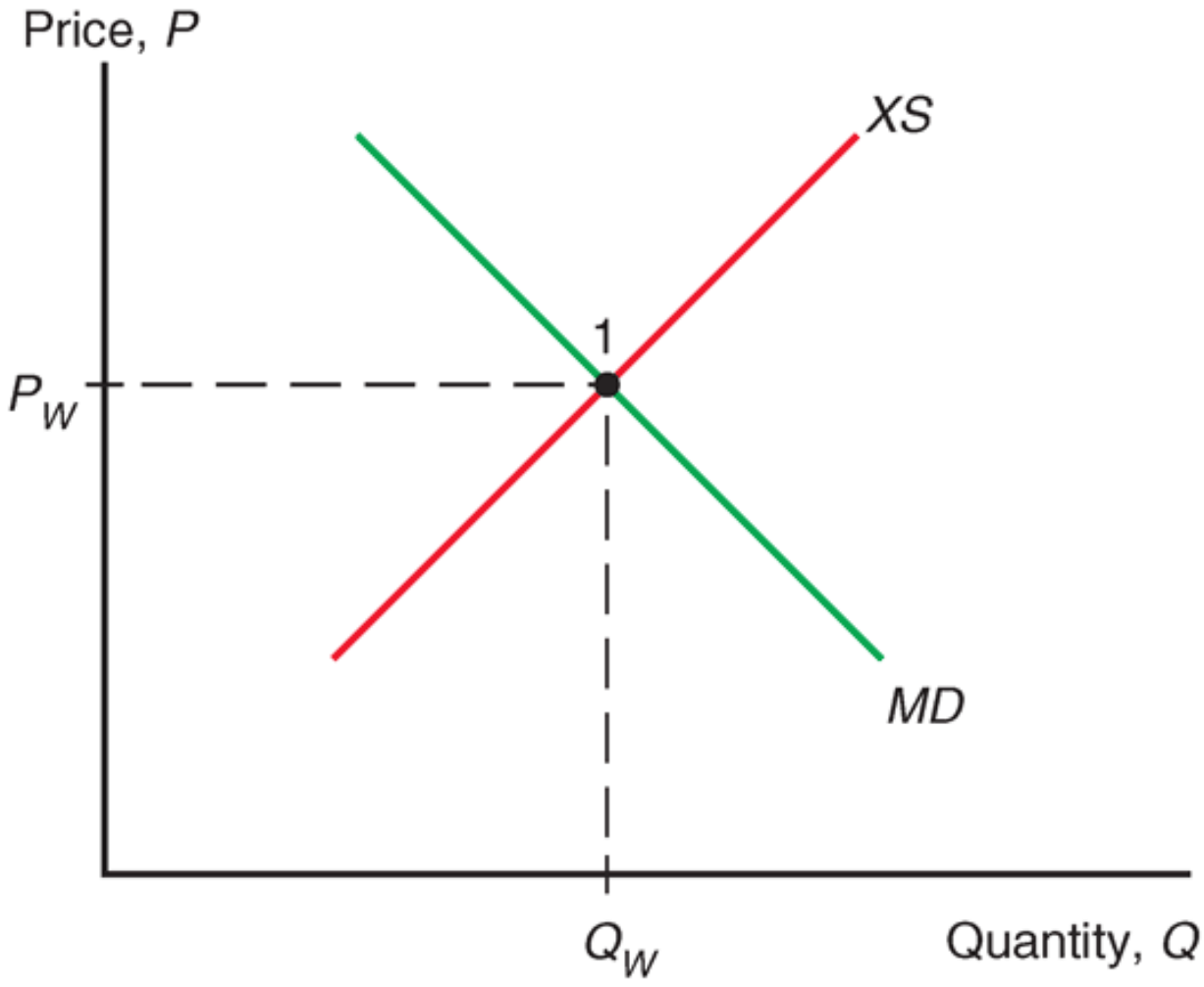
  domestic demand – domestic supply =

  foreign supply – foreign demand

- In equilibrium, the quantities of

  world demand = world supply

Fig. 8-3: World Equilibrium



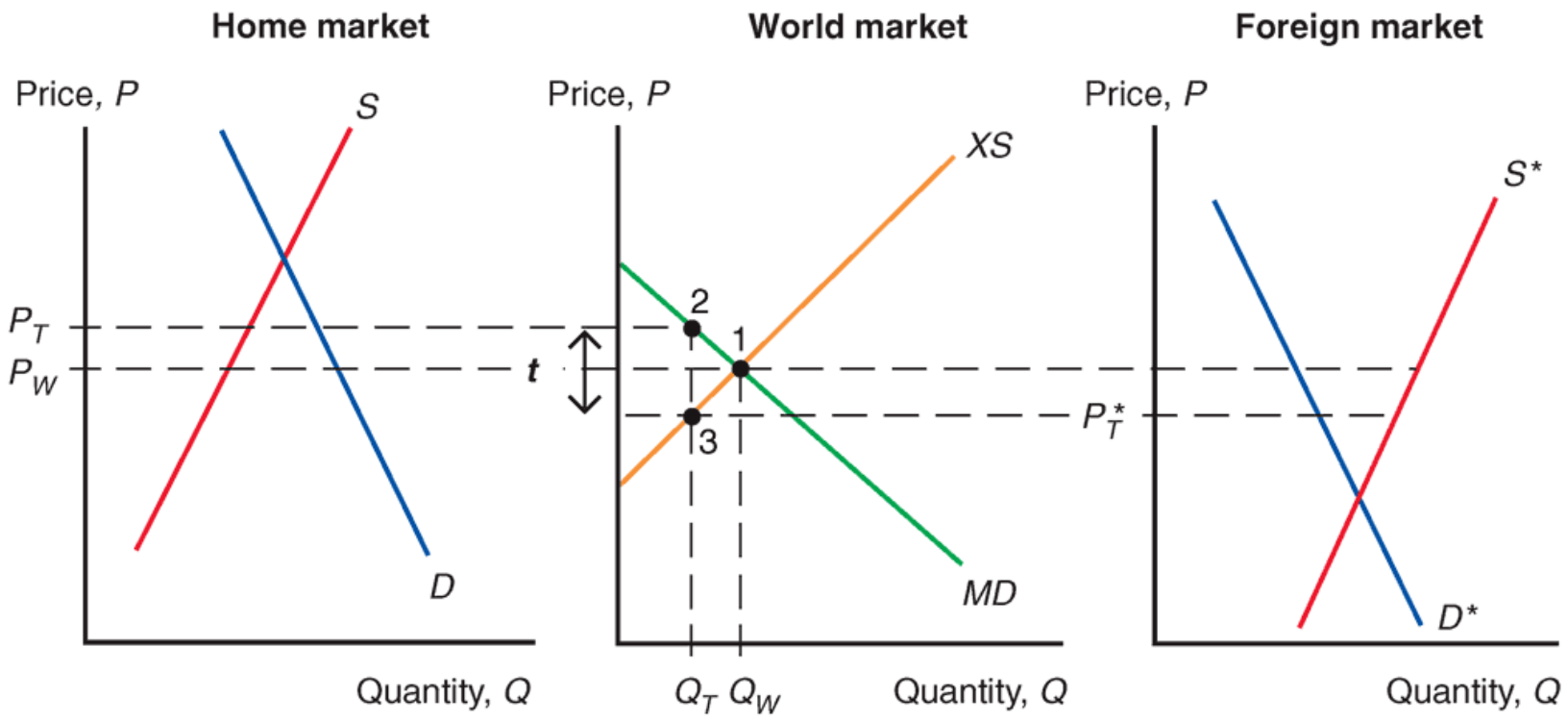
The Effects of a Tariff

- A tariff can be viewed as an added cost of transportation, making sellers unwilling to ship goods unless the price difference between the domestic and foreign markets exceeds the tariff.
- If sellers are unwilling to ship wheat, there is *excess demand* for wheat in the domestic market and *excess supply* in the foreign market.
  - The price of wheat will tend to rise in the domestic market.
  - The price of wheat will tend to fall in the foreign market.

The Effects of a Tariff (cont.)

- Thus, a tariff will make the price of a good rise in the domestic market and will make it fall in the foreign market, until the price difference equals the tariff.
  - $P_T - P^*_T = t$
  - $P_T = P^*_T + t$
  - The price of the good in foreign (world) markets should fall if there is a significant drop in the quantity demanded of the good caused by the domestic tariff.

Fig. 8-4: Effects of a Tariff



The Effects of a Tariff (cont.)

- Because the price in domestic markets rises (to P_T), domestic producers should supply more and domestic consumers should demand less.
  - The quantity of imports falls from Q_W to Q_T
- Because the price in foreign markets falls (to P^*_T), foreign producers should supply less and foreign consumers should demand more.
  - The quantity of exports falls from Q_W to Q_T

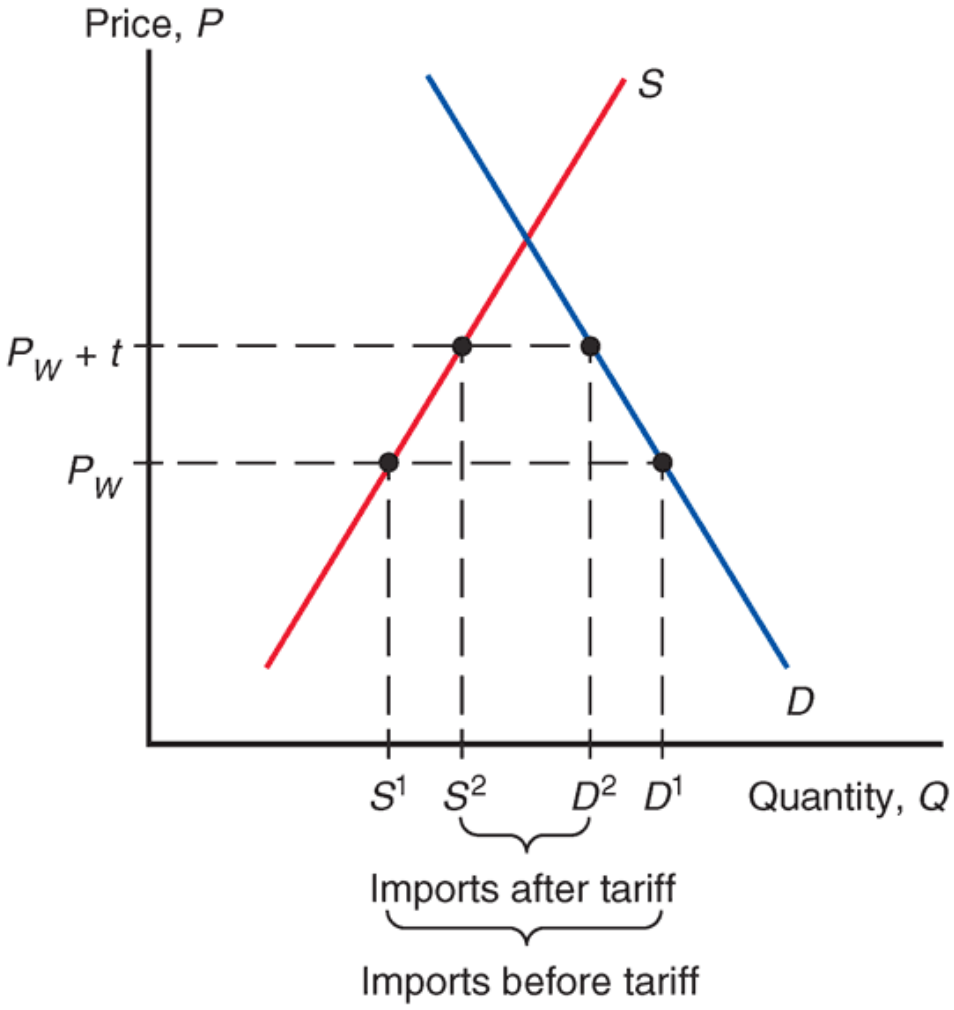
The Effects of a Tariff (cont.)

- The quantity of domestic import demand equals the quantity of foreign export supply when $P_T - P^*_T = t$
- In this case, the increase in the price of the good in the domestic country is less than the amount of the tariff.
  - Part of the effect of the tariff causes the foreign country's export price to decline, and thus is not passed on to domestic consumers.
  - But this effect is sometimes not very significant:

The Effects of a Tariff in a Small Country

- When a country is “small,” it has no effect on the foreign (world) price of a good, because its demand of the good is an insignificant part of world demand.
  - Therefore, the foreign price will not fall, but will remain at P_w
  - The price in the domestic market, however, will rise to $P_T = P_w + t$

Fig. 8-5: A Tariff in a Small Country



Effective Rate of Protection

- The **effective rate of protection** measures how much protection a tariff or other trade policy provides domestic producers.
  - It represents the change in value that firms in an industry add to the production process when trade policy changes.
  - The change in value that firms in an industry provide depends on the change in prices when trade policies change.
  - Effective rates of protection often differ from tariff rates because tariffs affect sectors other than the protected sector, causing indirect effects on the prices and value added for the protected sector.

Effective Rate of Protection (cont.)

- For example, suppose that automobiles sell in world markets for $8,000, and they are made from factors of production worth $6,000.
  - The value added of the production process is $8,000-$6,000
- Suppose that a country puts a 25% tariff on imported autos so that domestic auto assembly firms can now charge up to $10,000 instead of $8,000.
  - Auto assembly will occur in the domestic country if the value added is at least $10,000-$6,000.

Effective Rate of Protection (cont.)

- The effective rate of protection for domestic auto assembly firms is the change in value added:

($4,000 - $2,000)/$2,000 = 100%

- In this case, the effective rate of protection is greater than the tariff rate.

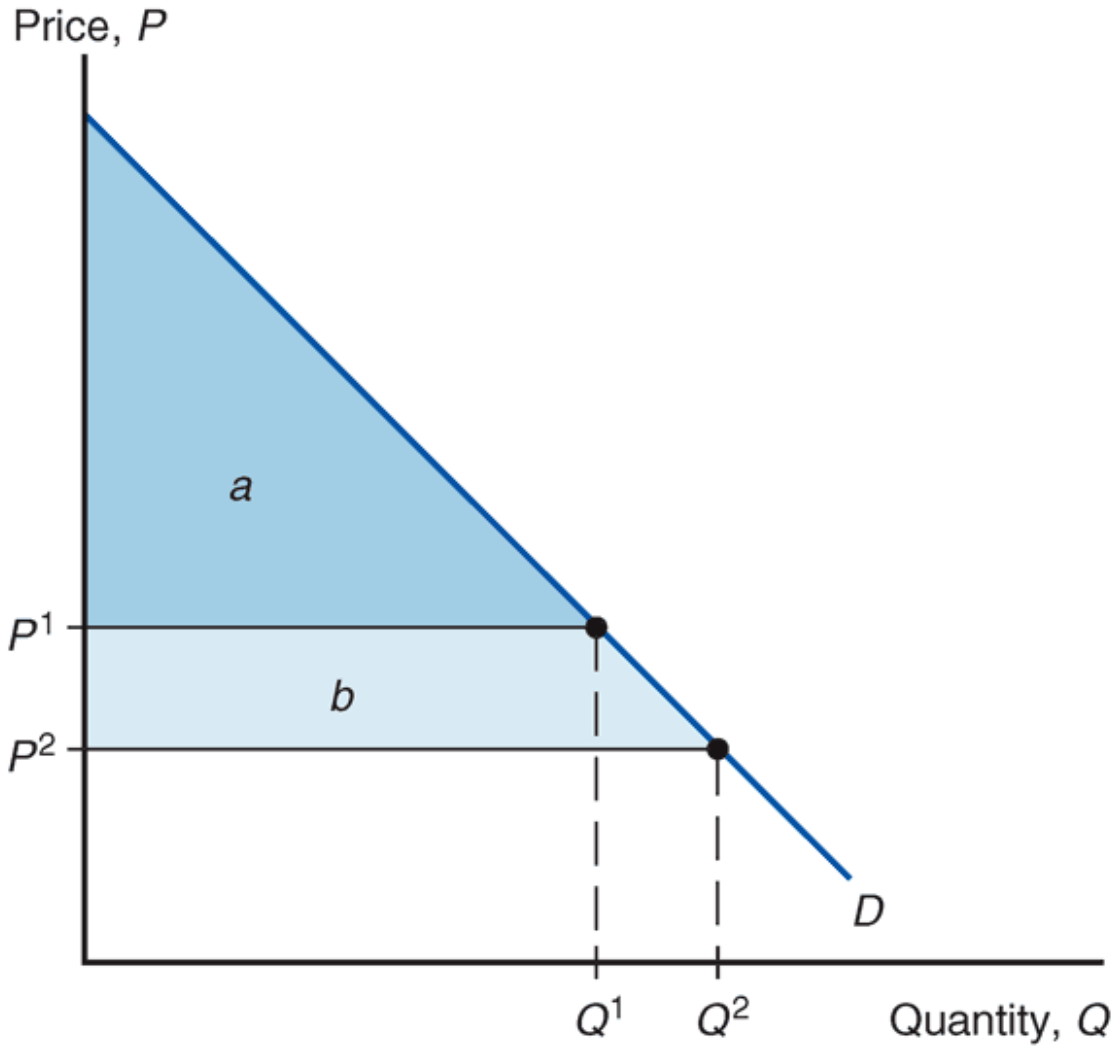
Costs and Benefits of Tariffs

- A tariff raises the price of a good in the importing country, so we expect it to hurt consumers and benefit producers there.
- In addition, the government gains tariff revenue from a tariff.
- How to measure these costs and benefits?
- We use the concepts of consumer surplus and producer surplus.

Consumer Surplus

- **Consumer surplus** measures the amount that consumers gain from purchases by the difference in the price that each pays from the maximum price each would be willing to pay.
  - The maximum price each would be willing to pay is determined by a demand (willingness to buy) function.
  - When the price increases, the quantity demanded decreases as well as the consumer surplus.

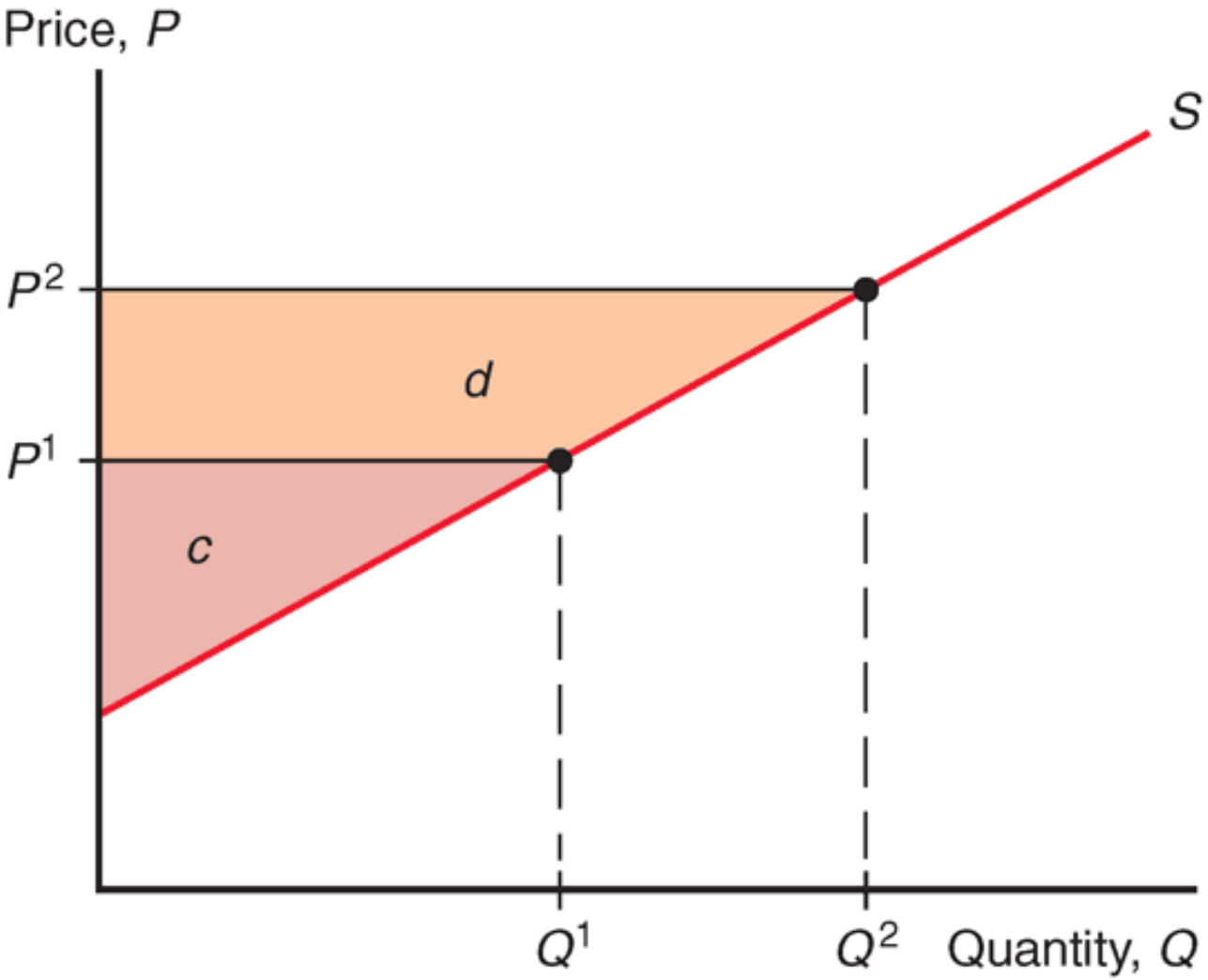
Fig. 8-7: Geometry of Consumer Surplus



Producer Surplus

- **Producer surplus** measures the amount that producers gain from a sale by the difference in the price each receives from the minimum price each would be willing to sell at.
  - The minimum price each would be willing to sell at is determined by a supply (willingness to sell) function.
  - When price increases, the quantity supplied increases as well as the producer surplus.

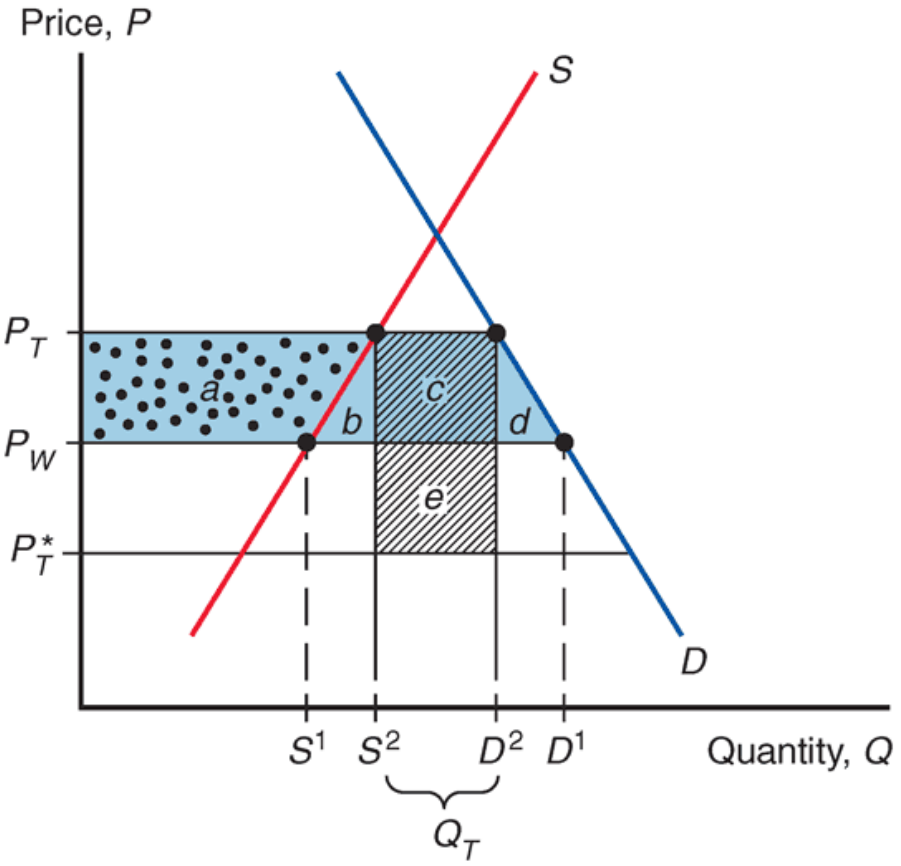
Fig. 8-8: Geometry of Producer Surplus



Costs and Benefits of Tariffs

- A tariff raises the price of a good in the importing country, making its consumer surplus decrease (making its consumers worse off) and making its producer surplus increase (making its producers better off).
- Also, government revenue will increase.

Fig. 8-9: Costs and Benefits of a Tariff for the Importing Country



Costs and Benefits of Tariffs (cont.)

- For a “large” country, whose imports and exports can affect foreign (world) prices, the welfare effect of a tariff is ambiguous.
- The triangles *b* and *d* represent the **efficiency loss**.
  - The tariff distorts production and consumption decisions: producers produce too much and consumers consume too little compared to the market outcome.
- The rectangle *e* represents the **terms of trade gain**.
  - The terms of trade increases because the tariff lowers foreign export (domestic import) prices.

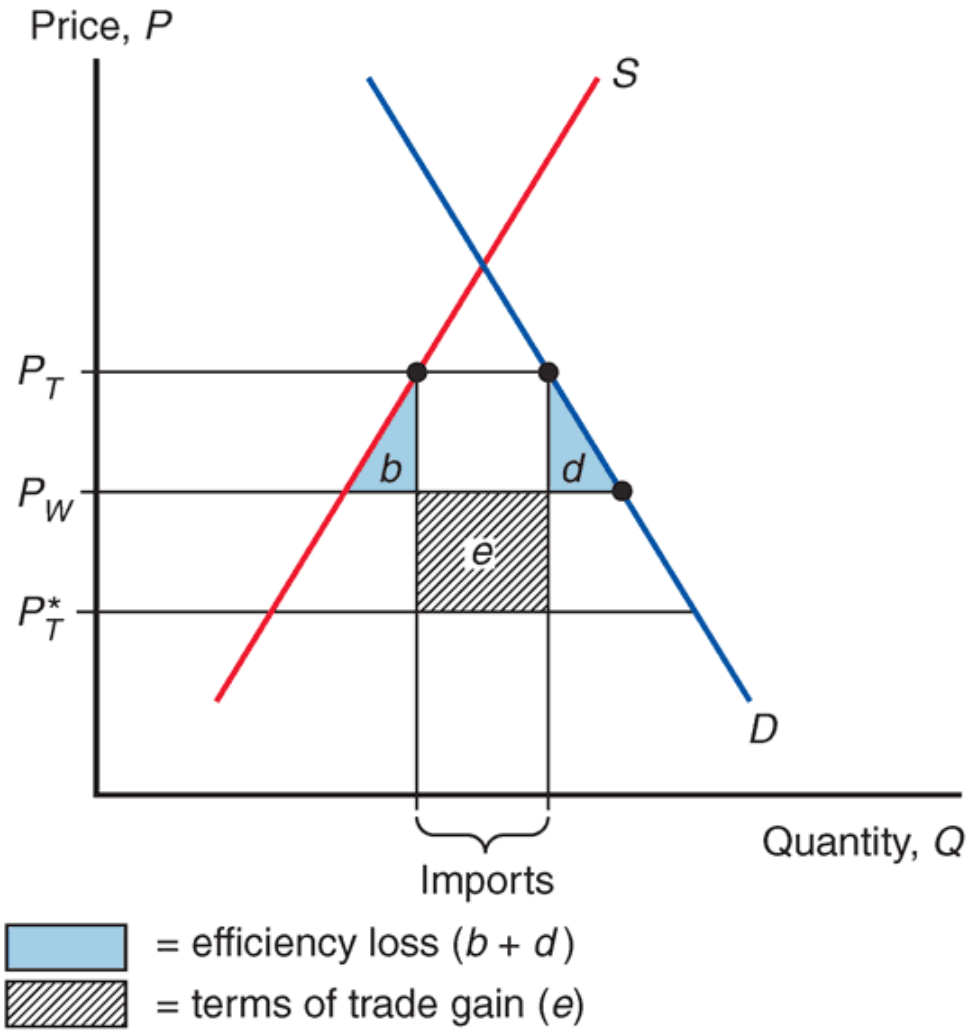
Costs and Benefits of Tariffs (cont.)

- Government revenue from the tariff equals the tariff rate times the quantity of imports.
  - $t = P_T - P^*_T$
  - $Q_T = D_2 - S_2$
  - Government revenue = $t \times Q_T = c + e$
- Part of government revenue (rectangle *e*) represents the terms of trade gain, and part (rectangle *c*) represents part of the value of lost consumer surplus.
  - The government gains at the expense of consumers and foreigners.

Costs and Benefits of Tariffs (cont.)

- If the terms of trade gain exceeds the efficiency loss, then national welfare will increase under a tariff, at the expense of foreign countries.
  - However, this analysis assumes that the terms of trade does not change due to tariff changes by foreign countries (that is, due to retaliation).

Fig. 8-10: Net Welfare Effects of a Tariff



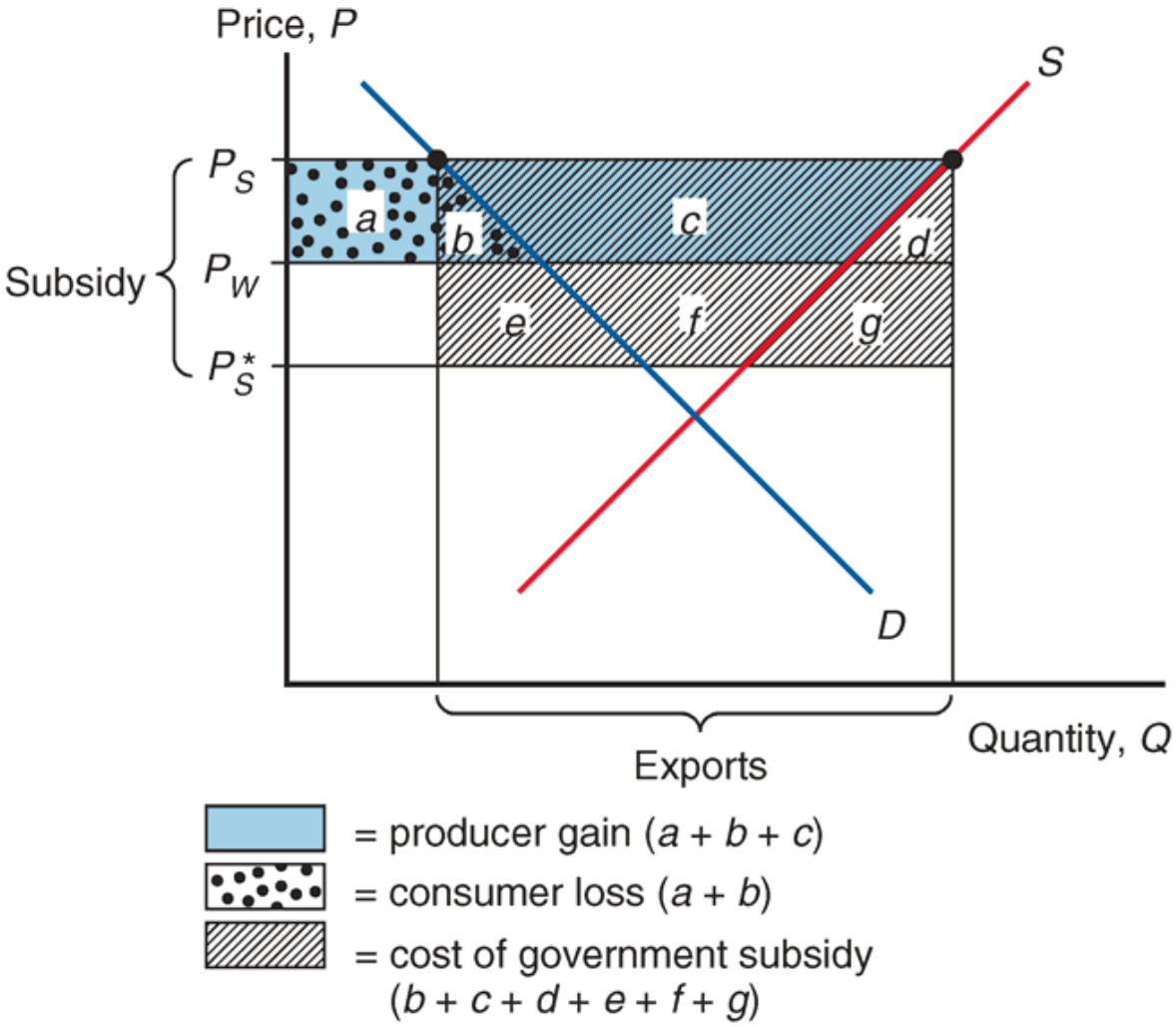
Export Subsidy

- An export subsidy can also be *specific* or *ad valorem*
  - A specific subsidy is a payment per unit exported.
  - An ad valorem subsidy is a payment as a proportion of the value exported.
- An export subsidy raises the price of a good in the exporting country, decreasing its consumer surplus (making its consumers worse off) and increasing its producer surplus (making its producers better off).
- Also, government revenue will decrease.

Export Subsidy (cont.)

- An export subsidy raises the price of a good in the exporting country, while lowering it in foreign countries.
- In contrast to a tariff, an export subsidy worsens the terms of trade by lowering the price of domestic products in world markets.

Fig. 8-11: Effects of an Export Subsidy



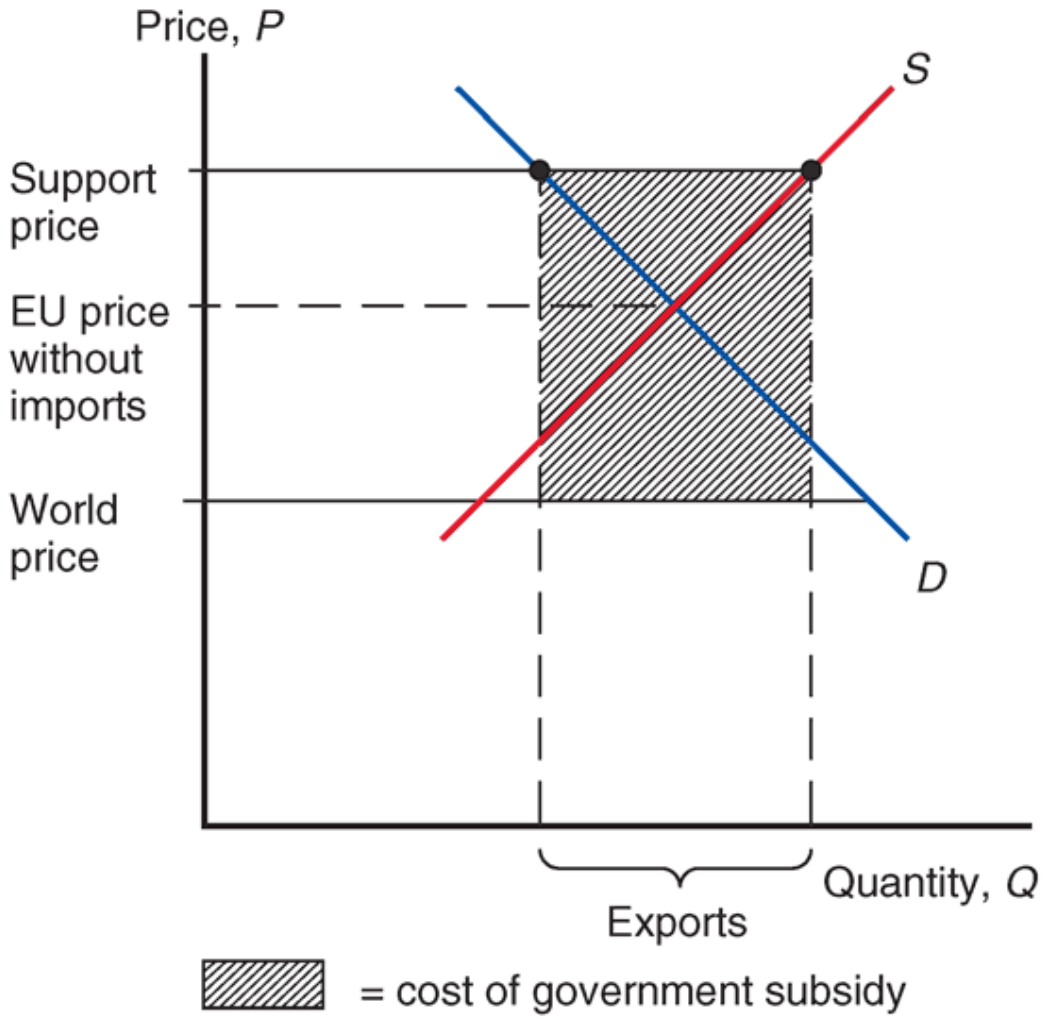
Export Subsidy (cont.)

- An export subsidy unambiguously produces a negative effect on national welfare.
- The triangles *b* and *d* represent the **efficiency loss**.
  - The subsidy distorts production and consumption decisions: producers produce too much and consumers consume too little compared to the market outcome.
- The area *b* + *c* + *d* + *f* + *g* represents the **cost of government subsidy**.
  - In addition, the terms of trade *decreases*, because the price of exports falls in foreign markets to P^*_s.

Export Subsidy in Europe

- The European Union's Common Agricultural Policy sets high prices for agricultural products and subsidizes exports to dispose of excess production.
  - The subsidized exports reduce world prices of agricultural products.
- The direct cost of this policy for European taxpayers is almost $50 billion.
  - But the EU has proposed that farmers receive direct payments independent of the amount of production to help lower EU prices and reduce production.

Fig. 8-12: Europe's Common Agricultural Program



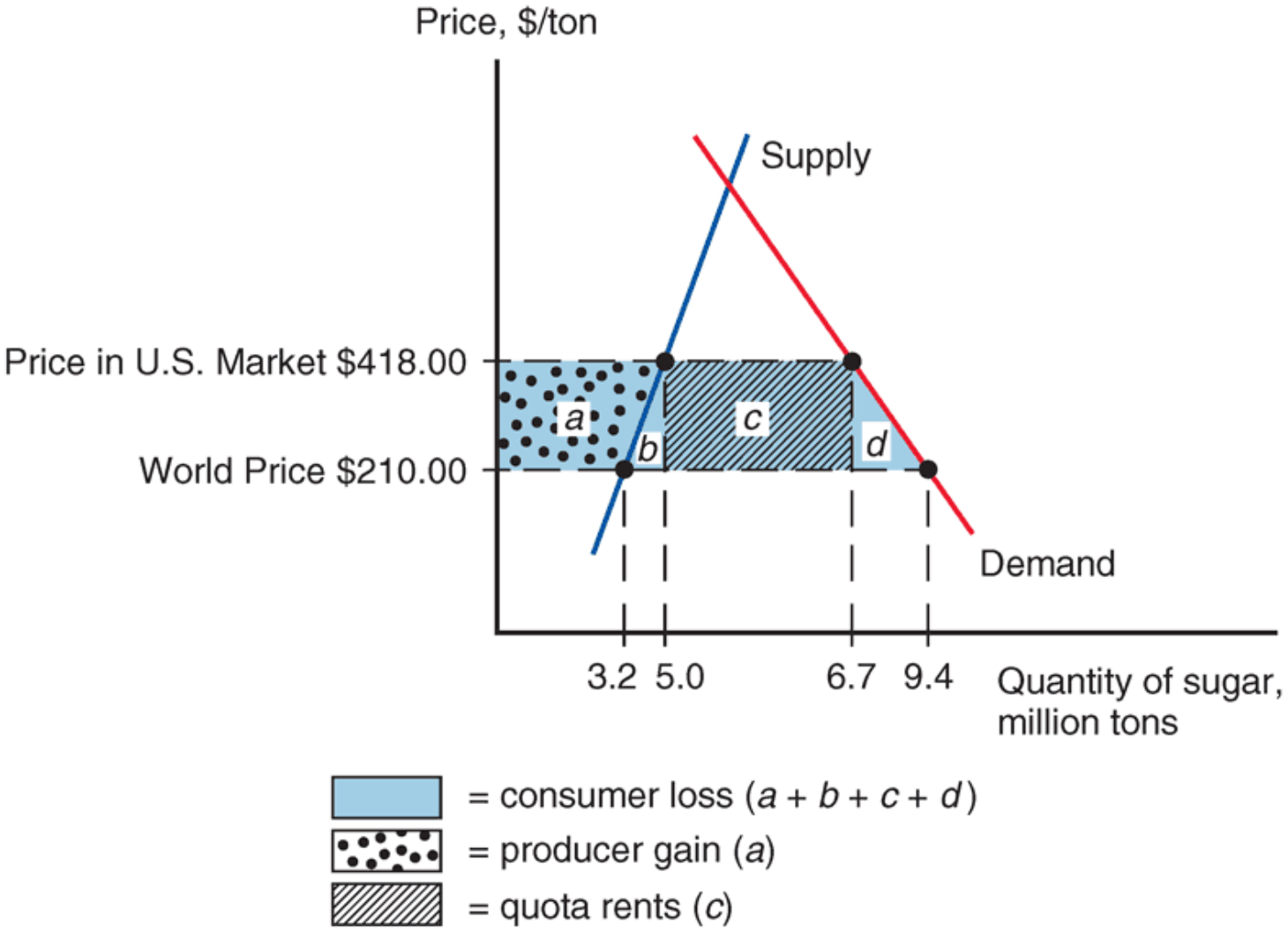
Import Quota

- An import quota is a restriction on the quantity of a good that may be imported.
- This restriction is usually enforced by issuing licenses to domestic firms that import, or in some cases to foreign governments of exporting countries.
- A binding import quota will push up the price of the import because the quantity demanded will exceed the quantity supplied by domestic producers and from imports.

Import Quota (cont.)

- When a quota instead of a tariff is used to restrict imports, the government receives no revenue.
  - Instead, the revenue from selling imports at high prices goes to quota license holders: either domestic firms or foreign governments.
  - These extra revenues are called **quota rents**.

Fig. 8-13: Effects of the U.S. Import Quota on Sugar



Voluntary Export Restraint

- A **voluntary export restraint** works like an import quota, except that the quota is imposed by the exporting country rather than the importing country.
- However, these restraints are usually requested by the importing country.
- The profits or rents from this policy are earned by foreign governments or foreign producers.
  - Foreigners sell a restricted quantity at an increased price.

Local Content Requirement

- A **local content requirement** is a regulation that requires a specified fraction of a final good to be produced domestically.
- It may be specified in value terms, by requiring that some minimum share of the value of a good represent domestic valued added, or in physical units.

Local Content Requirement (cont.)

- From the viewpoint of domestic producers of inputs, a local content requirement provides protection in the same way that an import quota would.
- From the viewpoint of firms that must buy domestic inputs, however, the requirement does not place a strict limit on imports, but allows firms to import more if they also use more domestic parts.

Local Content Requirement (cont.)

- Local content requirement provides neither government revenue (as a tariff would) nor quota rents.
- Instead the difference between the prices of domestic goods and imports is averaged into the price of the final good and is passed on to consumers.

Other Trade Policies

- Export credit subsidies
  - A subsidized loan to exporters
  - U.S. Export-Import Bank subsidizes loans to U.S. exporters.
- Government procurement
  - Government agencies are obligated to purchase from domestic suppliers, even when they charge higher prices (or have inferior quality) compared to foreign suppliers.
- Bureaucratic regulations
  - Safety, health, quality, or customs regulations can act as a form of protection and trade restriction.

Summary

	Tariff	Export subsidy	Import quota	Voluntary export restraint
Producer surplus	Increases	Increases	Increases	Increases
Consumer surplus	Decreases	Decreases	Decreases	Decreases
Government net revenue	Increases	Decreases	No change: rents to license holders	No change: rents to foreigners
National welfare	Ambiguous, falls for small country	Decreases	Ambiguous, falls for small country	Decreases

Summary (cont.)

1. A tariff decreases the world price of the imported good, increases the domestic price of the imported good and reduces the quantity traded when a country is “large”.
2. A quota does the same.
3. An export subsidy decreases the world price of the exported good increases the domestic price of the exported good and increases the quantity produced when a country is “large”.

Summary (cont.)

4. The welfare effect of a tariff, quota and export subsidy can be measured by:
   - Efficiency loss from consumption and production
   - Terms of trade gain or loss
5. With import quotas, voluntary export restraints and local content requirements; the government of the importing country receives no revenue.
6. With voluntary export restraints and occasionally import quotas, quota rents go to foreigners.

Additional Chapter Art

Fig. 8-6: Deriving Consumer Surplus from the Demand Curve

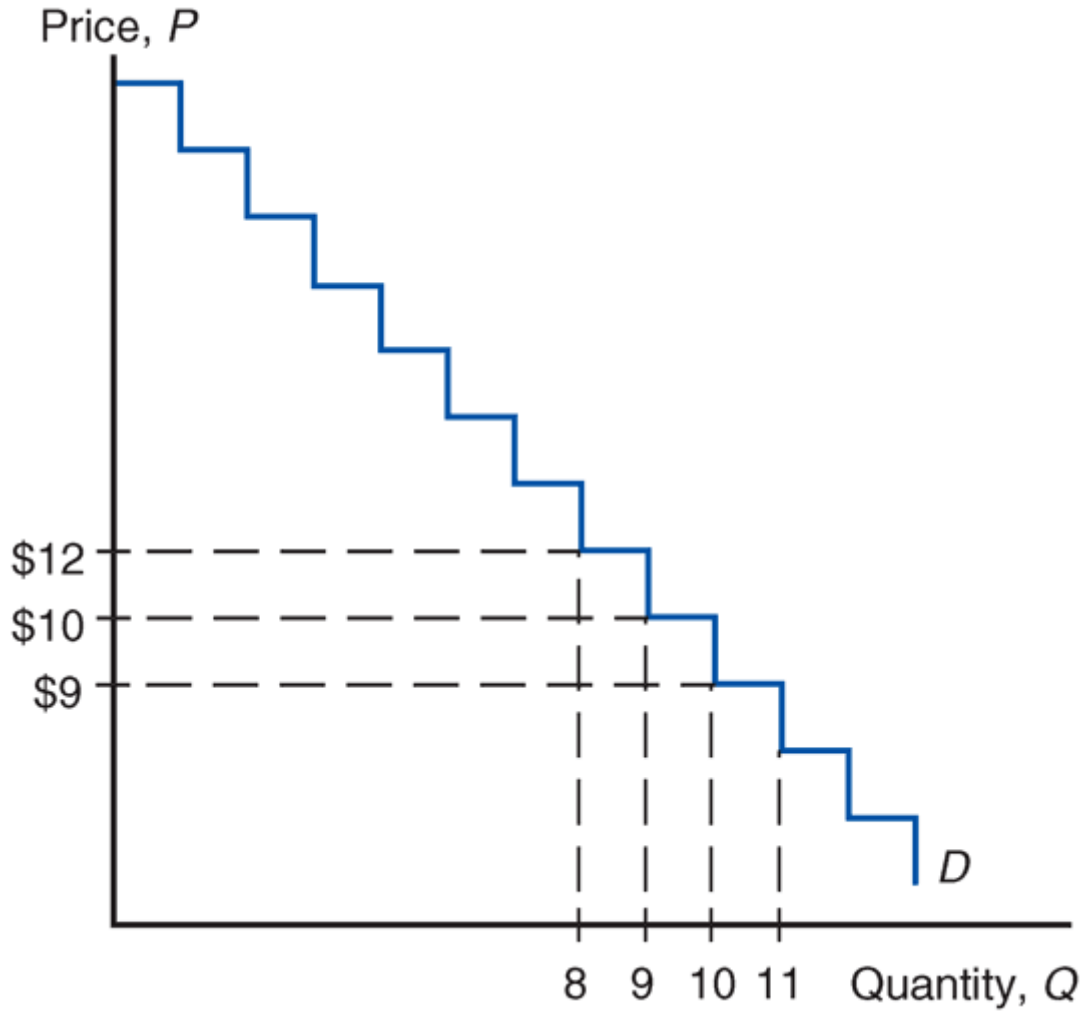


Table 8-1: Effects of Alternative Trade Policies

	Tariff	Export Subsidy	Import Quota	Voluntary Export Restraint
Producer surplus	Increases	Increases	Increases	Increases
Consumer surplus	Falls	Falls	Falls	Falls
Government revenue	Increases	Falls (government spending rises)	No change (rents to license holders)	No change (rents to foreigners)
Overall national welfare	Ambiguous (falls for small country)	Falls	Ambiguous (falls for small country)	Falls

Fig. 8A1-1: Free Trade Equilibrium for a Small Country

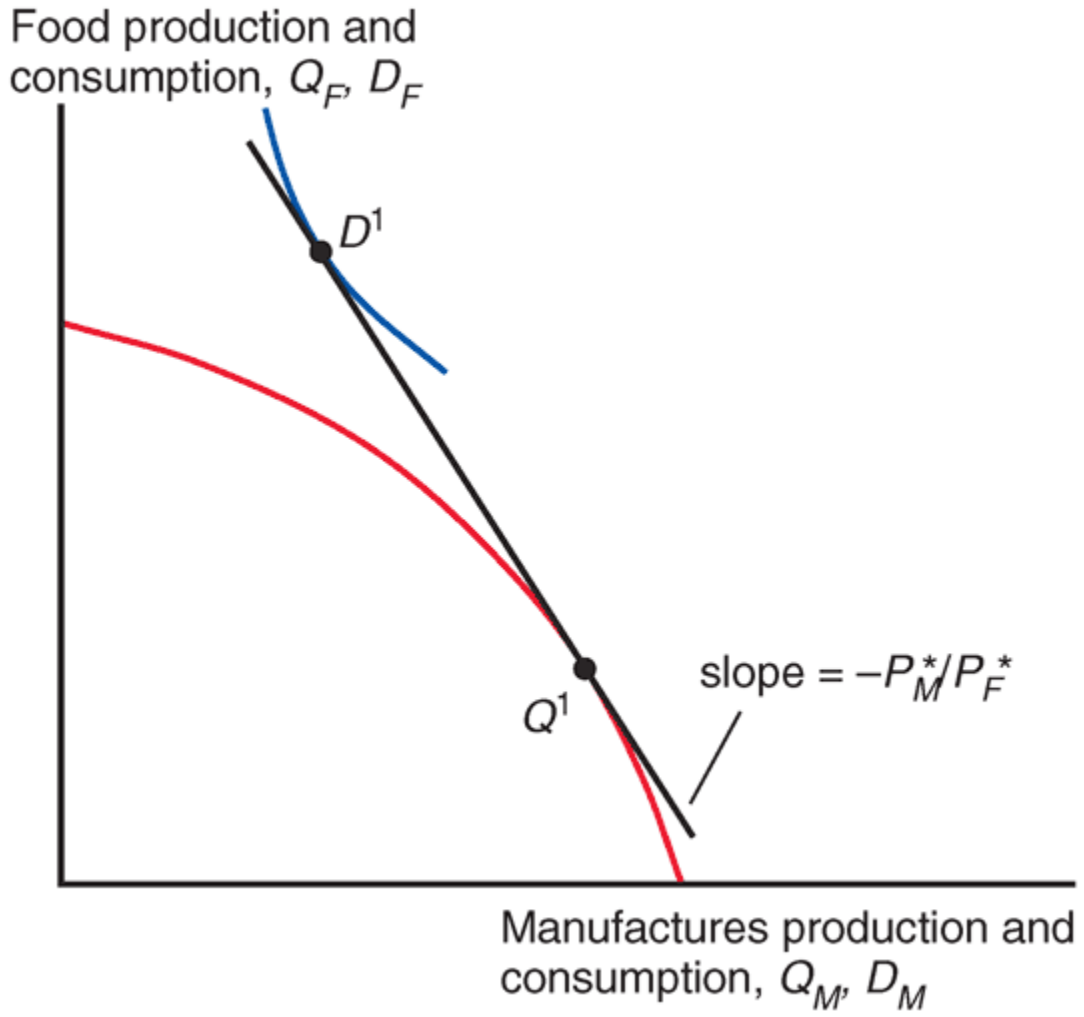


Fig. 8A1-2: A Tariff in a Small Country

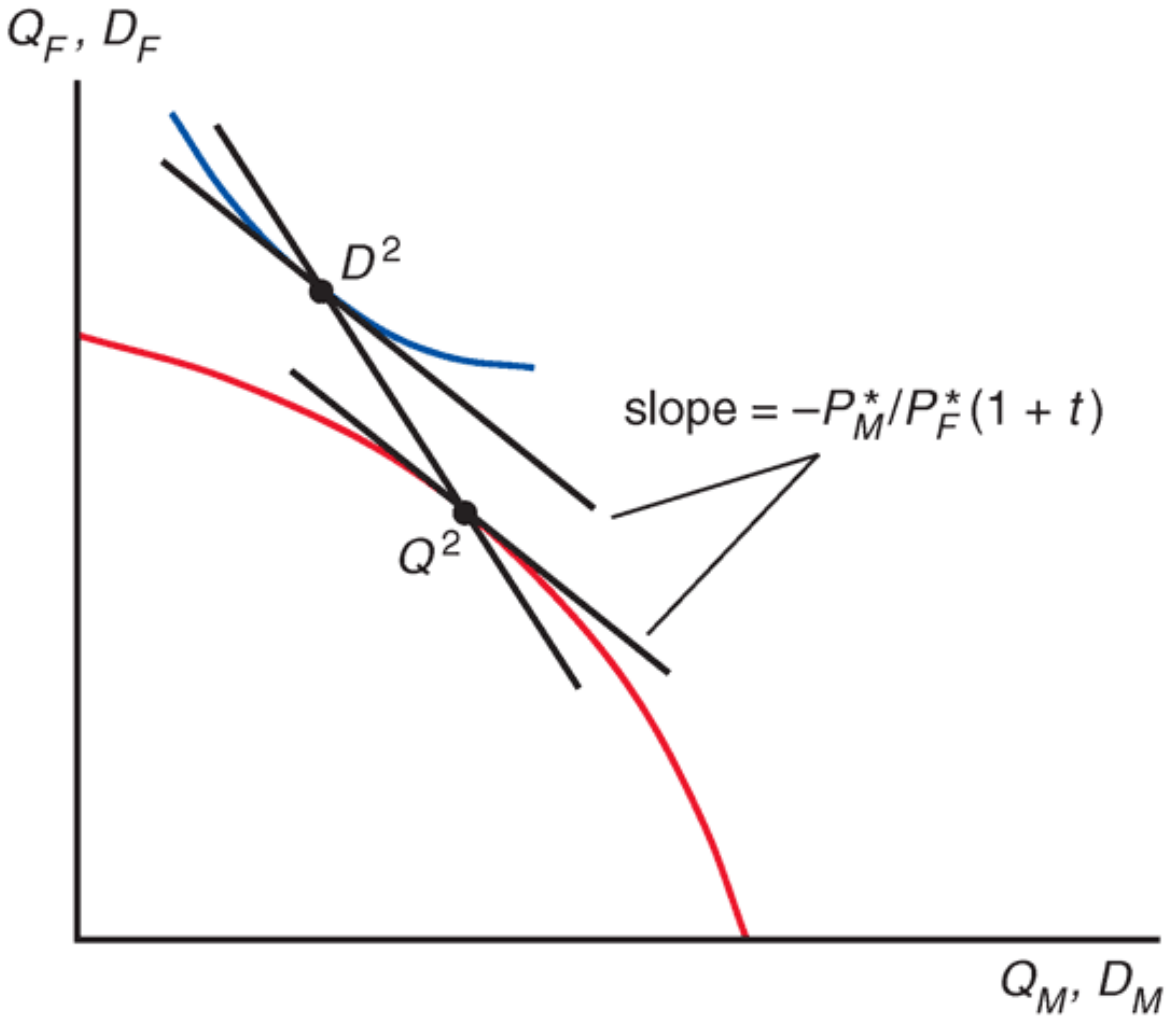


Fig. 8A1-3: Effect of a Tariff on the Terms of Trade

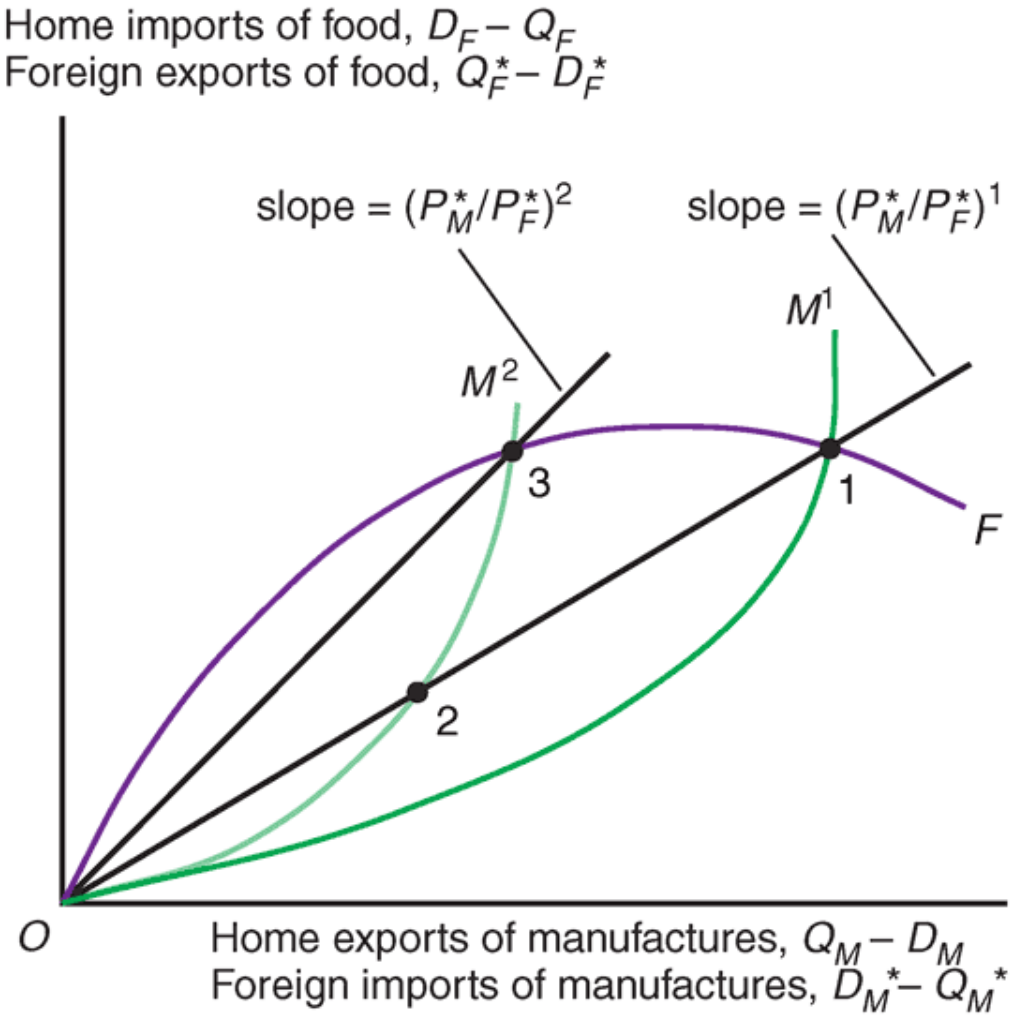


Fig. 8A2-1: A Monopolist Under Free Trade

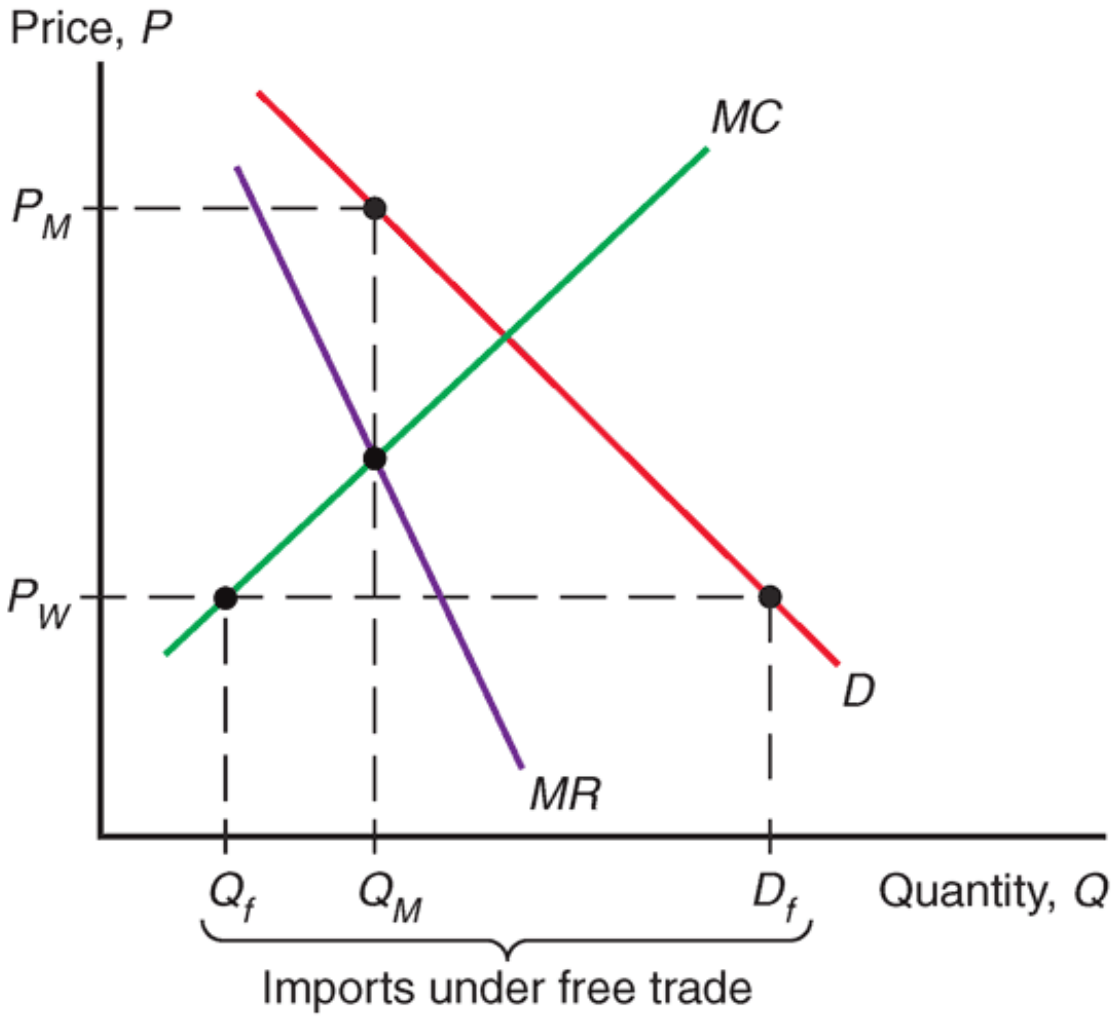


Fig. 8A2-2: A Monopolist Protected by a Tariff

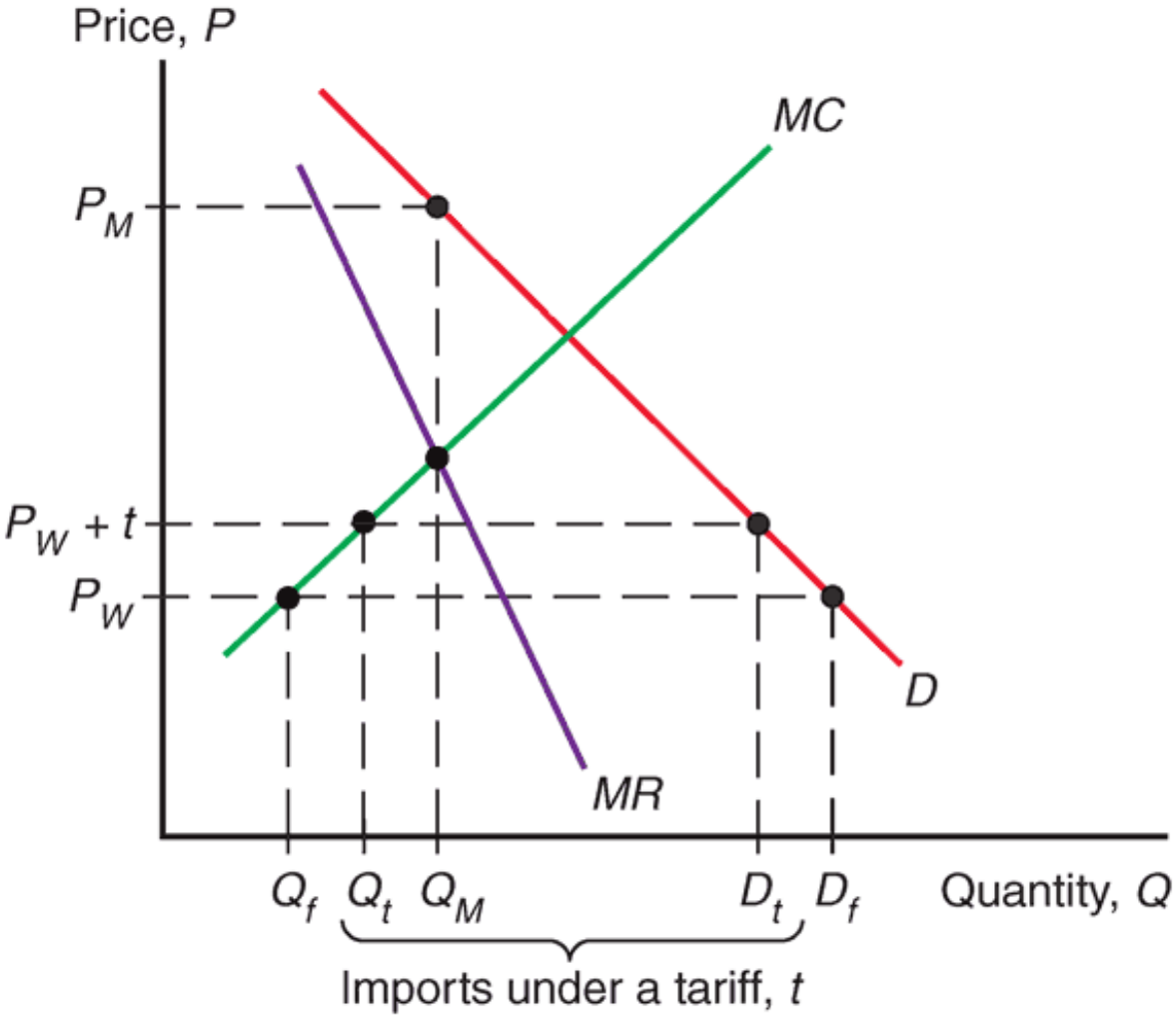


Fig. 8A2-3: A Monopolist Protected by an Import Quota

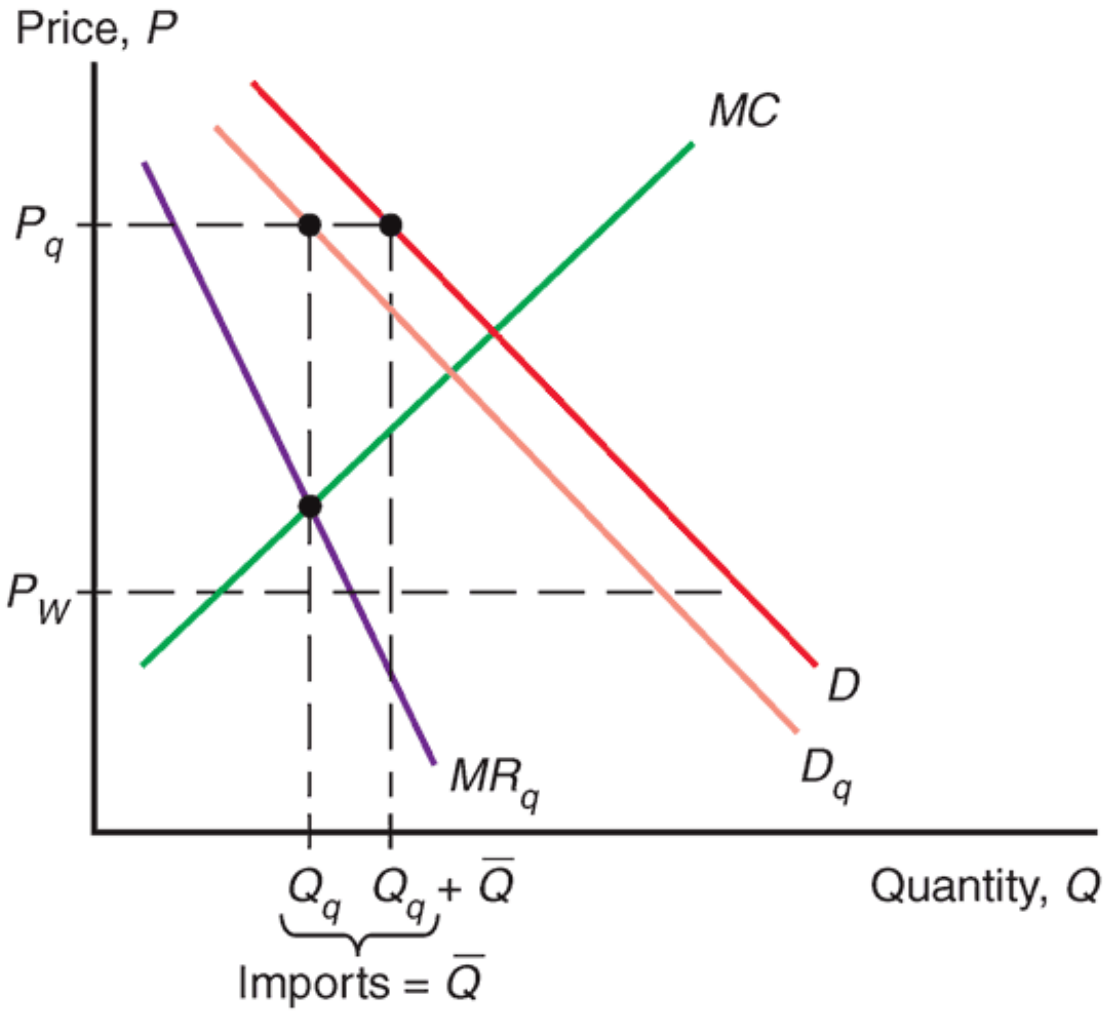


Fig. 8A2-4: Comparing a Tariff and a Quota