EC 380: Lecture 7

Trade Policy: Tariffs, Quotas and Subsidies

Philip Economides
Winter 2024

Prologue

Recap

Previously

- Trade openness appears to have had an affect on the compositional make-up of US industrial activity

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- Effects of protectionism through **tariff rates and quotas**
- Inform ourselves on how interference with free trade impacts market

Key Topics

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- New **unconventional methods** of protectionism

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- **Quota**: Weight and quantity limits on the amount of goods that can be imported into the country

Not all quotas are acts of protectionism. Some are required for national security (e.g. protecting the domestic supply of food), or to avoid health concerns related to imports from specific countries (e.g. livestock diseases)

Tariffs Analysis

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Why? Trade policy, like any other form of intervention, introduces **costs for firms**, which get passed on to consumers. Some will **switch to domestic goods**.

Tariffs Analysis

Consumer Demand Curve

Tariffs Analysis

Consumer Demand Curve

- Demand is mapped by the marginal willingness of individuals to pay for a good at a given price
- At a particularly high price, only a small number of individuals would purchase
- **As price falls**, the good enters into a greater pool of individuals' marginal willingness to pay, leading to **quantity demanded rising**

Therefore, we assume a **negative relationship** between market price and quantity demanded

Tariffs Analysis

Producer Supply Curve

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- When the market price is particularly low, only a small number of firms can afford to service the market
- As **price rises**, the **quantity supplied to the market increases**, given that the greater associated revenue makes business profitable for an increasing number of firms.

Therefore, we assume a **positive relationship** between market price and quantity supplied

Tariffs Analysis

Consumer and Producer Surplus

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Combining these two strands of intuition:

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As per standard econ: market produces where supply meets demand.

Any difference between marginal willingness to pay and price represents surplus for the consumer. Similarly the case for producers.

Tariffs Analysis

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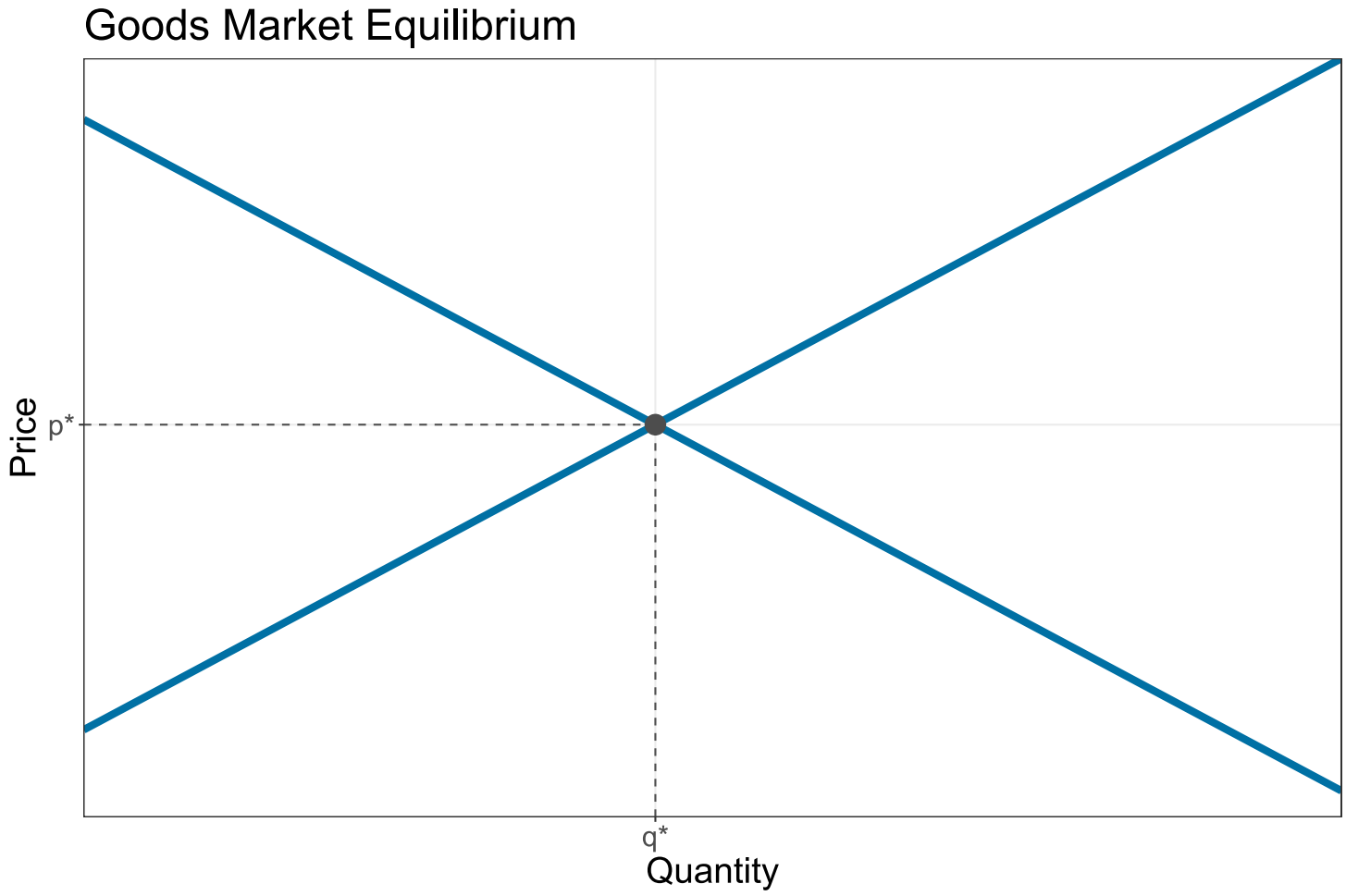
Consumer and Producer Surplus



Tariff Analysis

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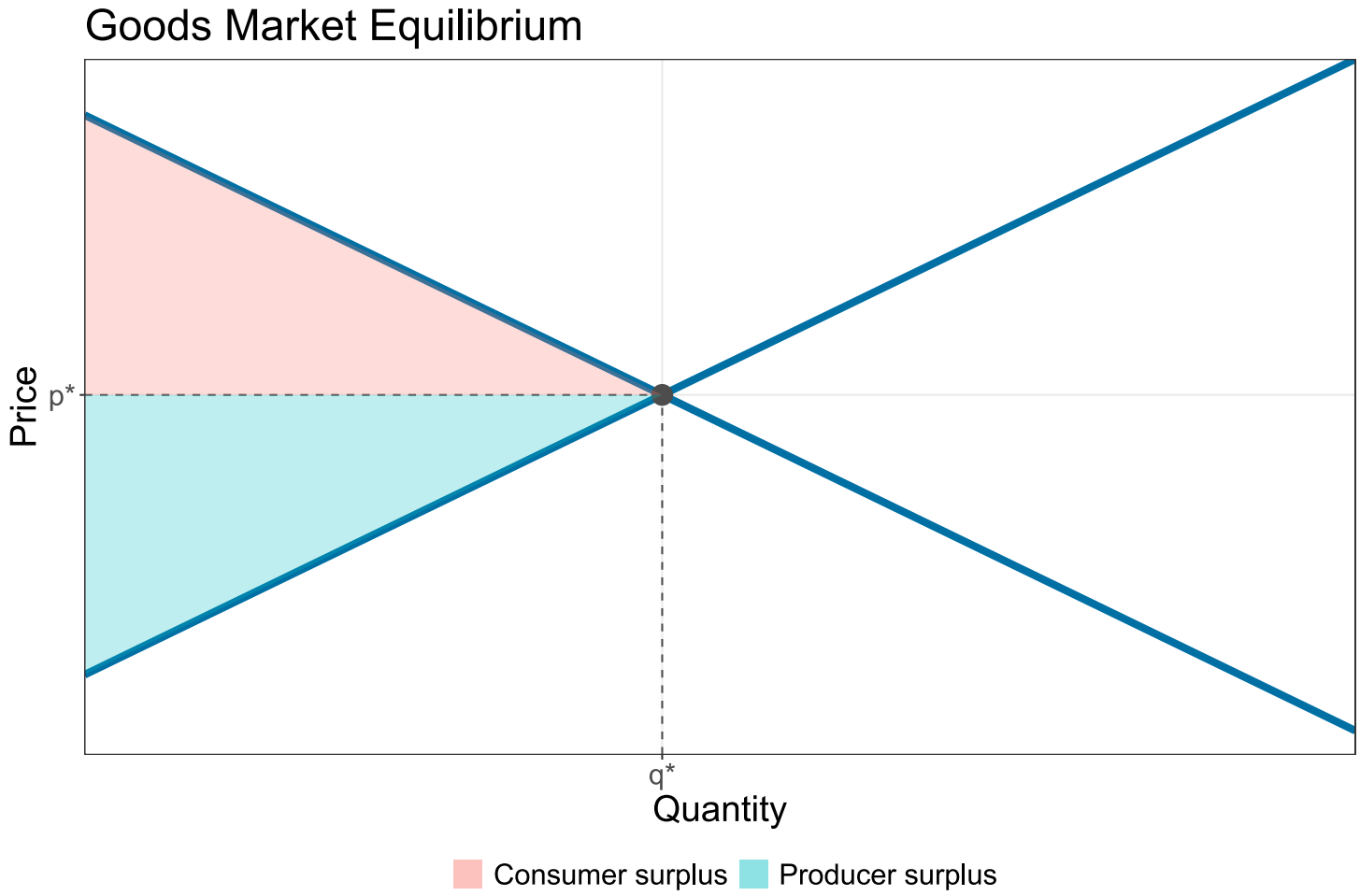

Tariff Analysis

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$$\text{CS} = \frac{1}{2} \times [\ \text{Demand}(q = 0) - \ p^* \ ] \times q_d^*$$

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We are simply calculating the areas of the triangles for our measures of CS and PS in this free-market scenario.

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How do tariffs influece P and Q?

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How do tariffs influece P and Q?

- Our demand and supply curves will reflect national production capacitys
- Equilibrium price is determined by world price

Tariff Analysis

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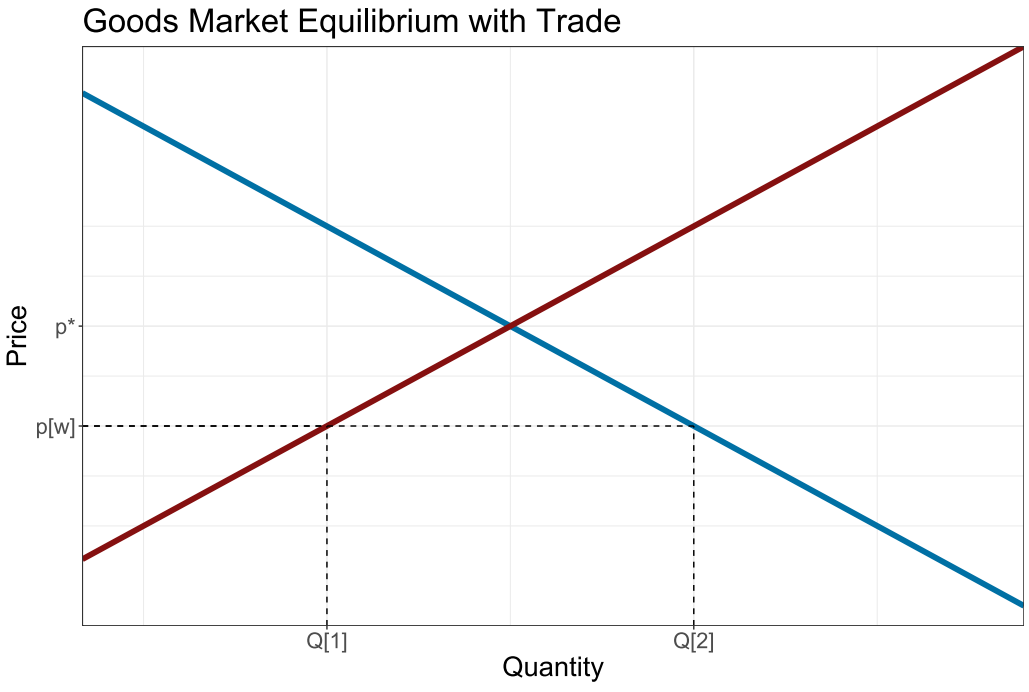

$p_w < p^*$

Local supply Q_1 below market demand Q_2

Import amount is $Q_2 - Q_1$

Tariff will upset this balance

- Market experiences a huge increase in CS due to trade, PS falls, but net welfare rises ($CS + PS$)
- Assume small country, scale of demand cannot affect **world price**

Tariff Analysis

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Government imposes tariff amount t, per good imported

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Price updates to $P_t = P_w + t$, all of our outcome variables are affected

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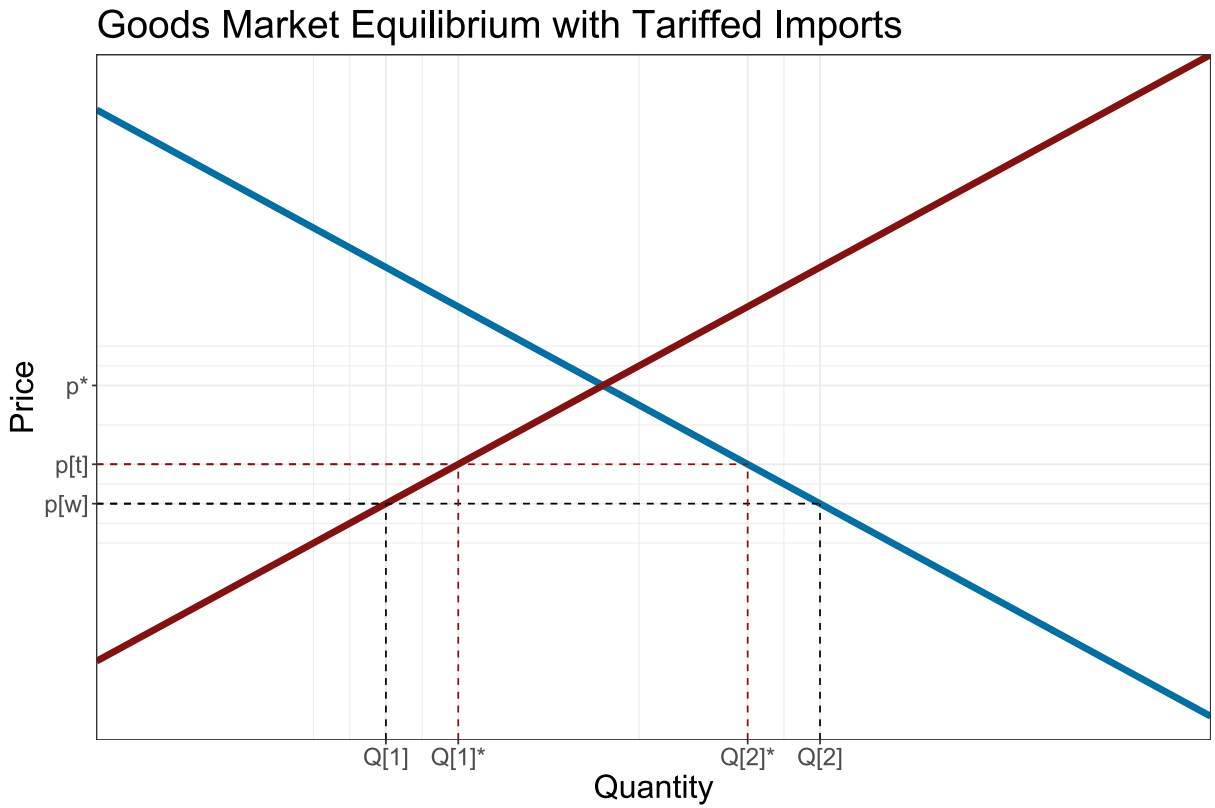

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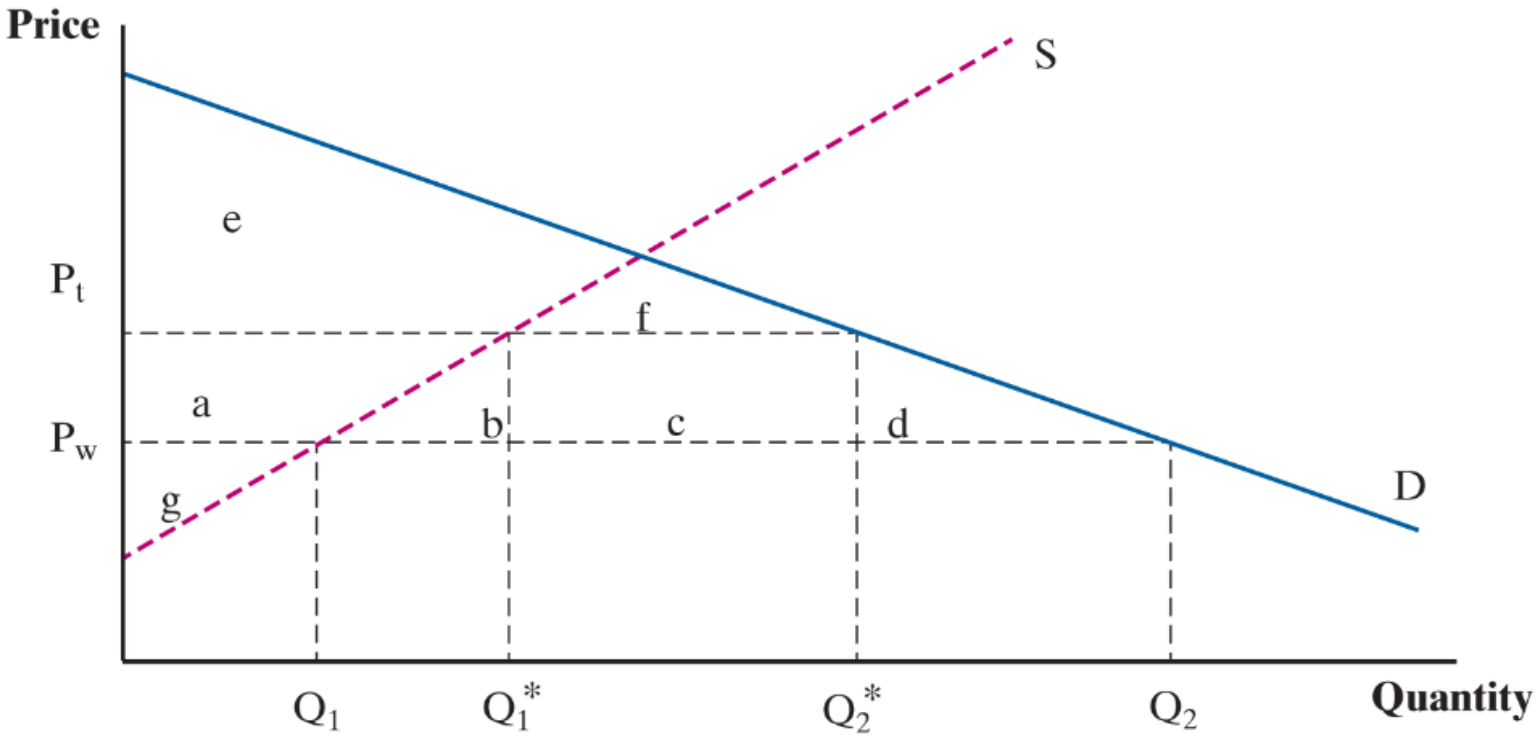

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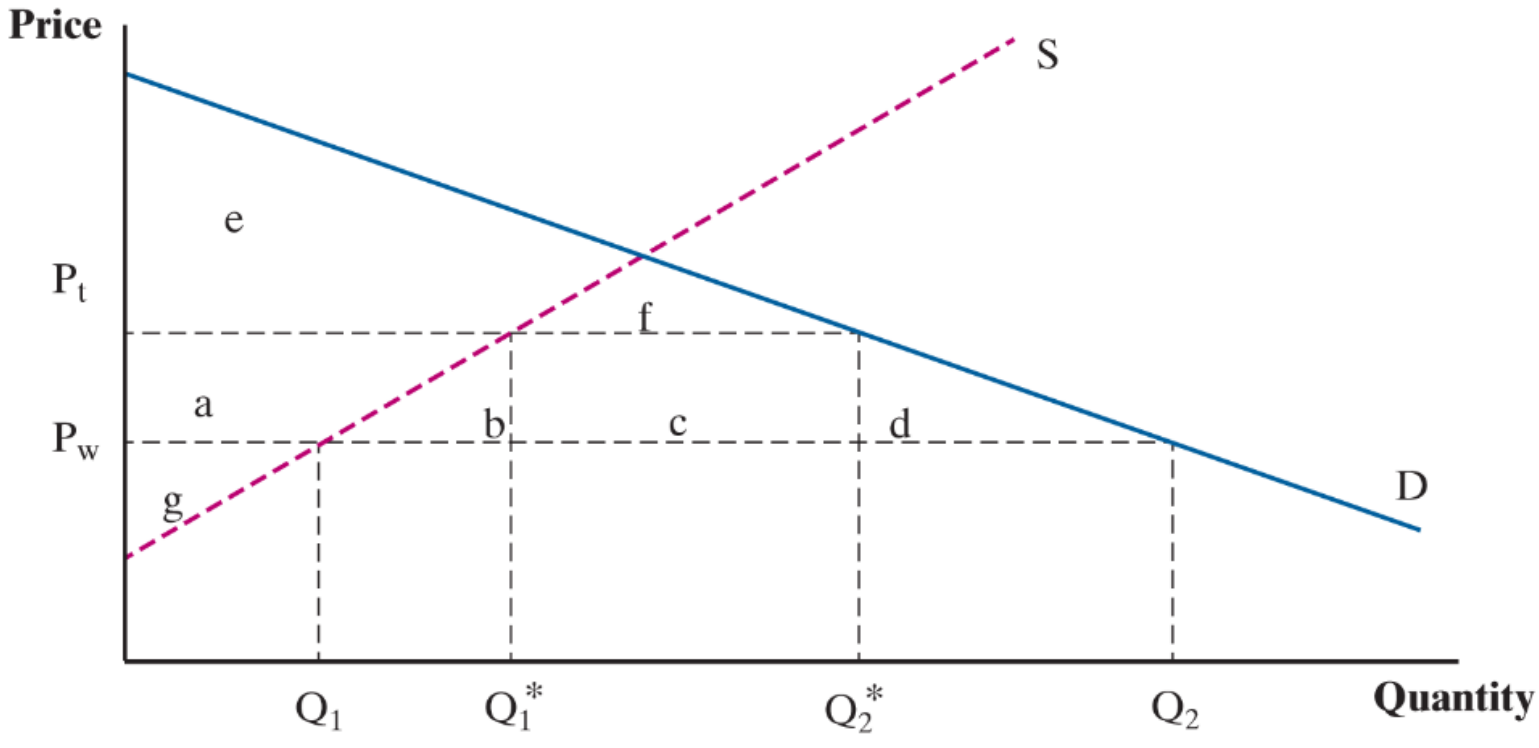
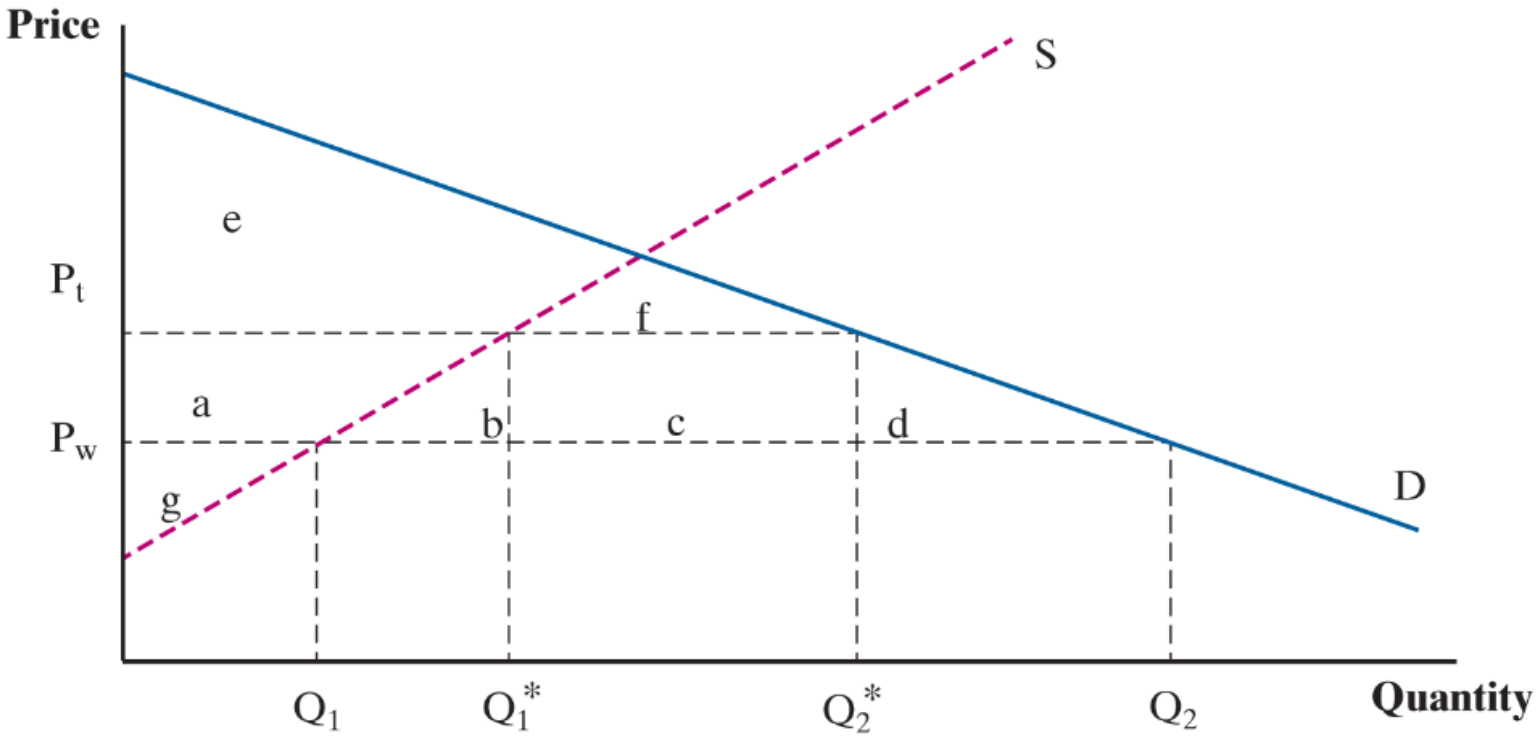


CS under **free trade**, where $t = 0$: $a + b + c + d + e + f$

Tariff Analysis



CS under **tariff**, where $t = 10$: $e + f$

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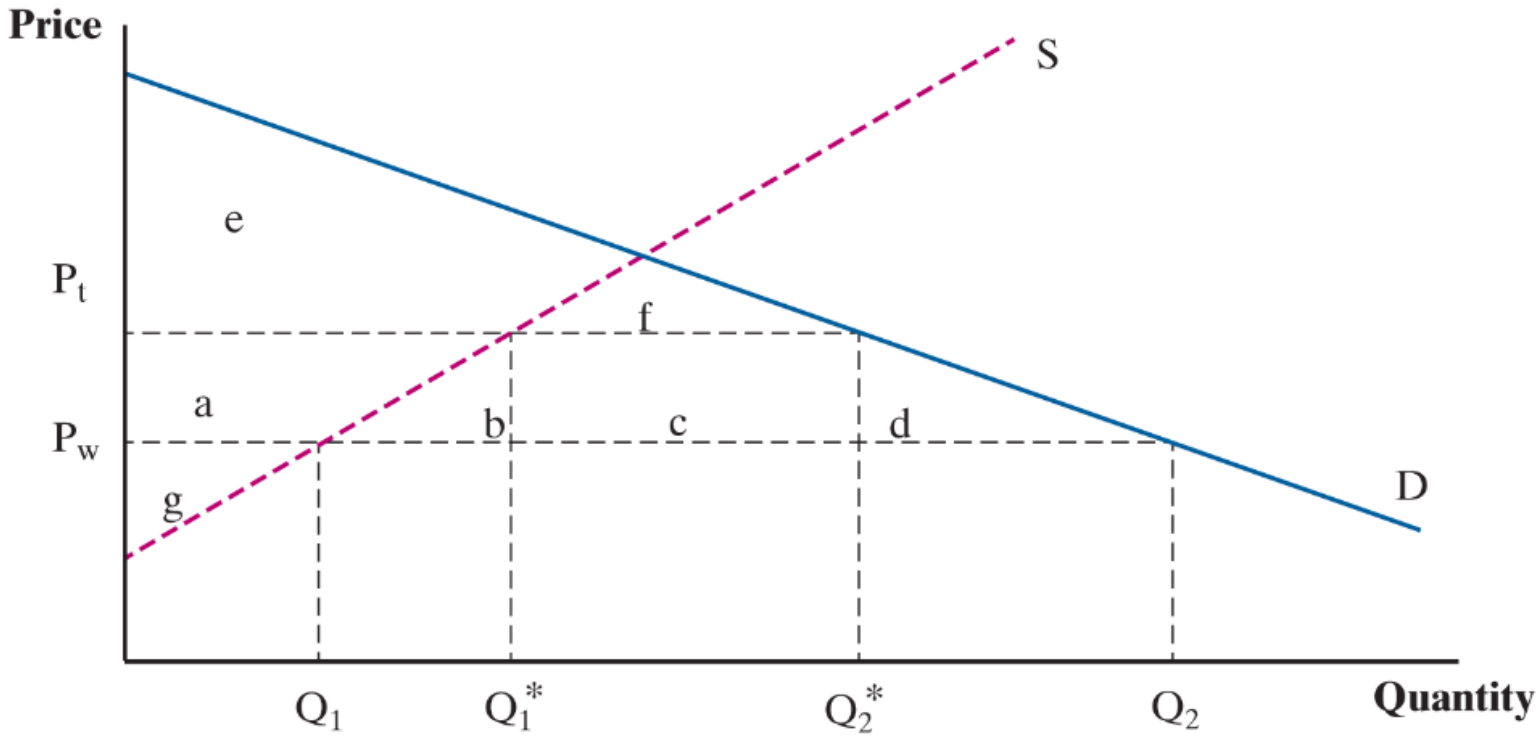

CS under **tariff**, where $t = 10$: $e + f$

$\Delta CS = -(a + b + c + d)$

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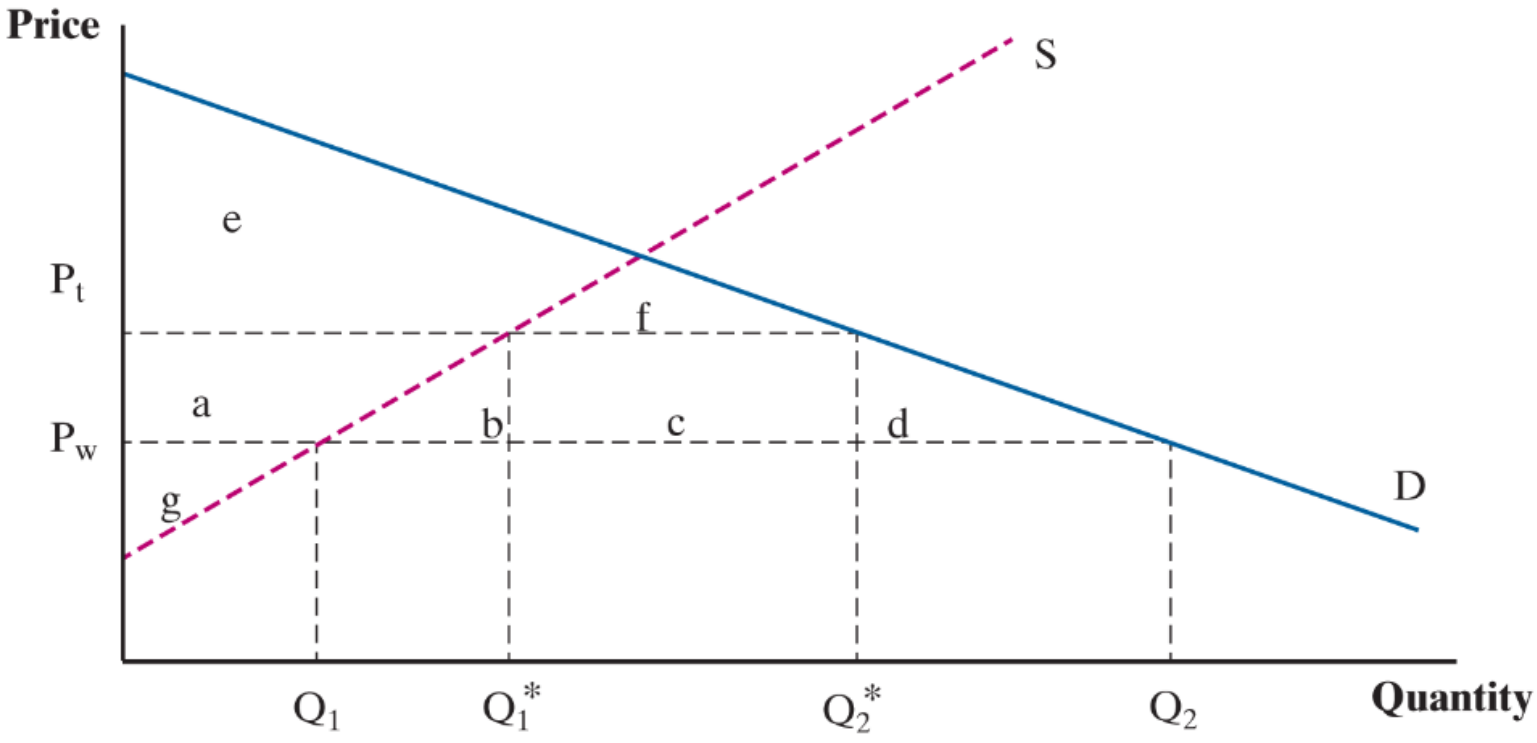

PS under **free trade**, where $t = 0$: g

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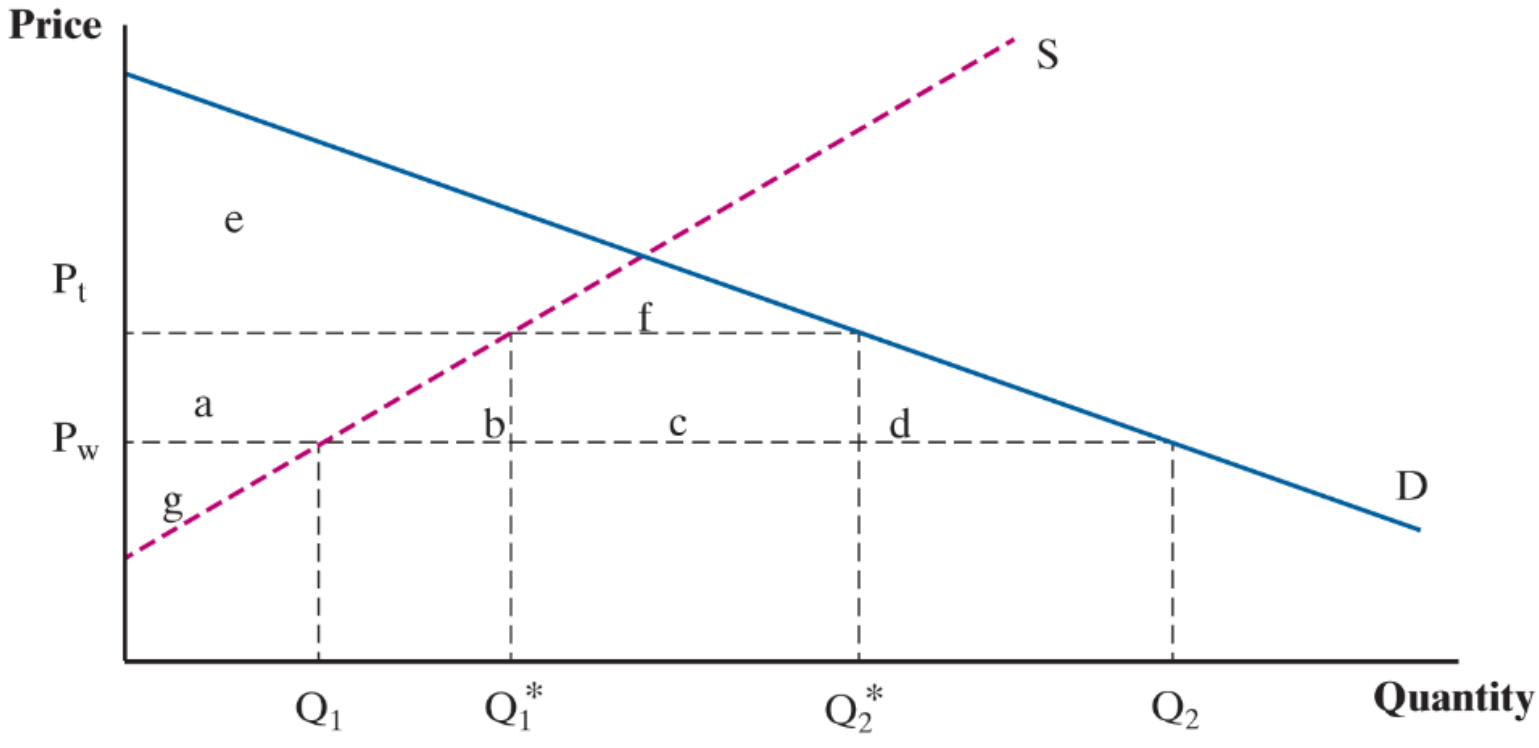

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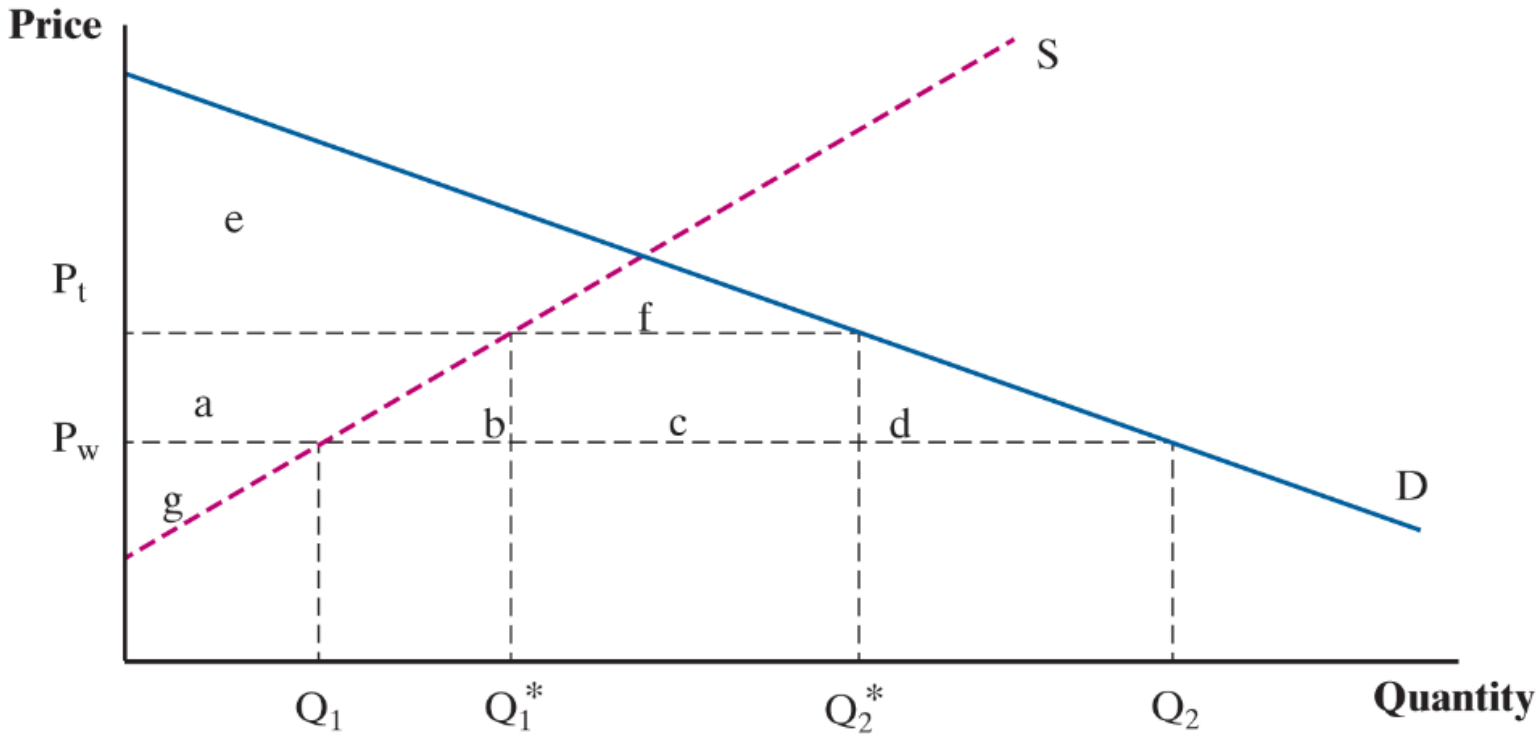

PS under **tariff**, where $t = 10$: $g + a$

$\Delta PS = a$ transferred from consumers to producers

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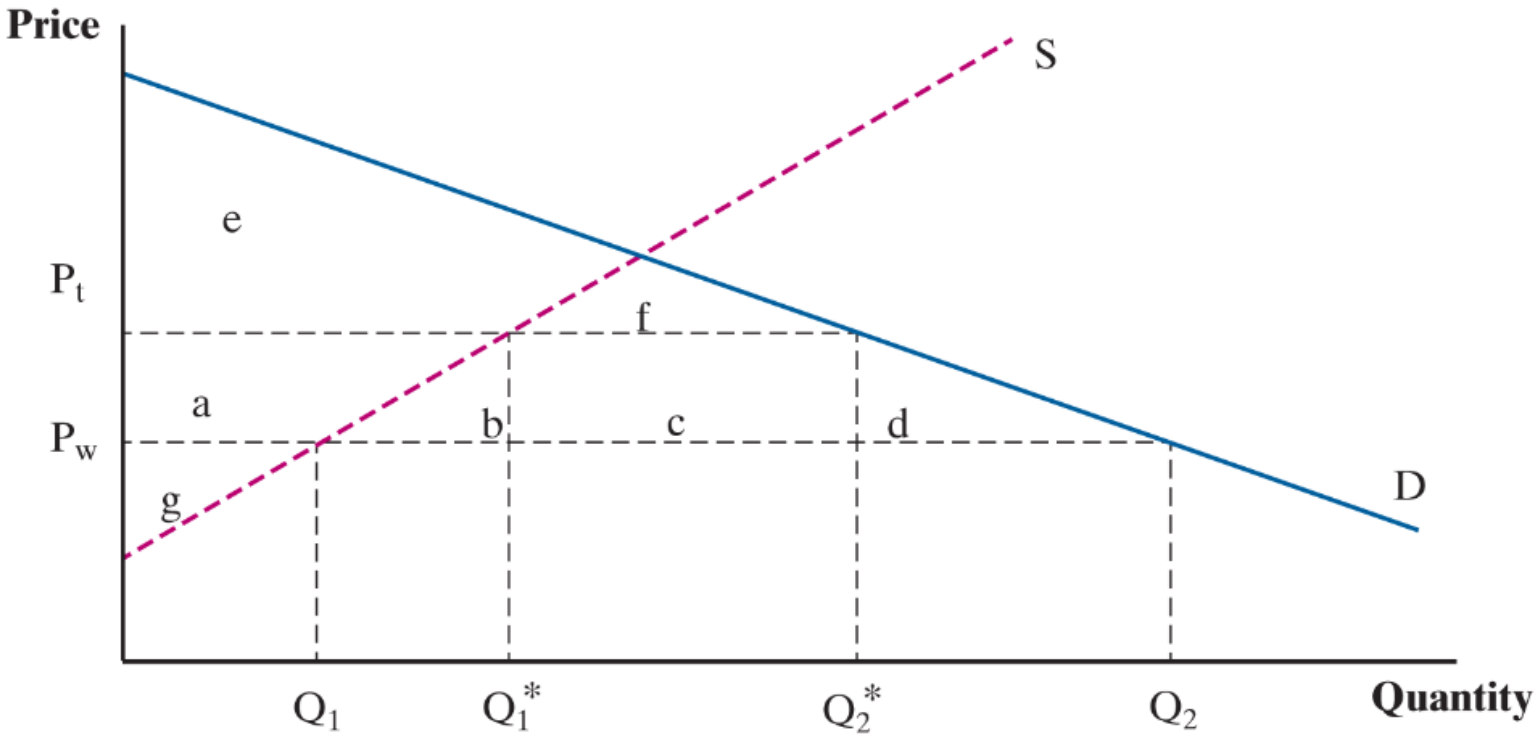

Government collects revenue t times the number of imports

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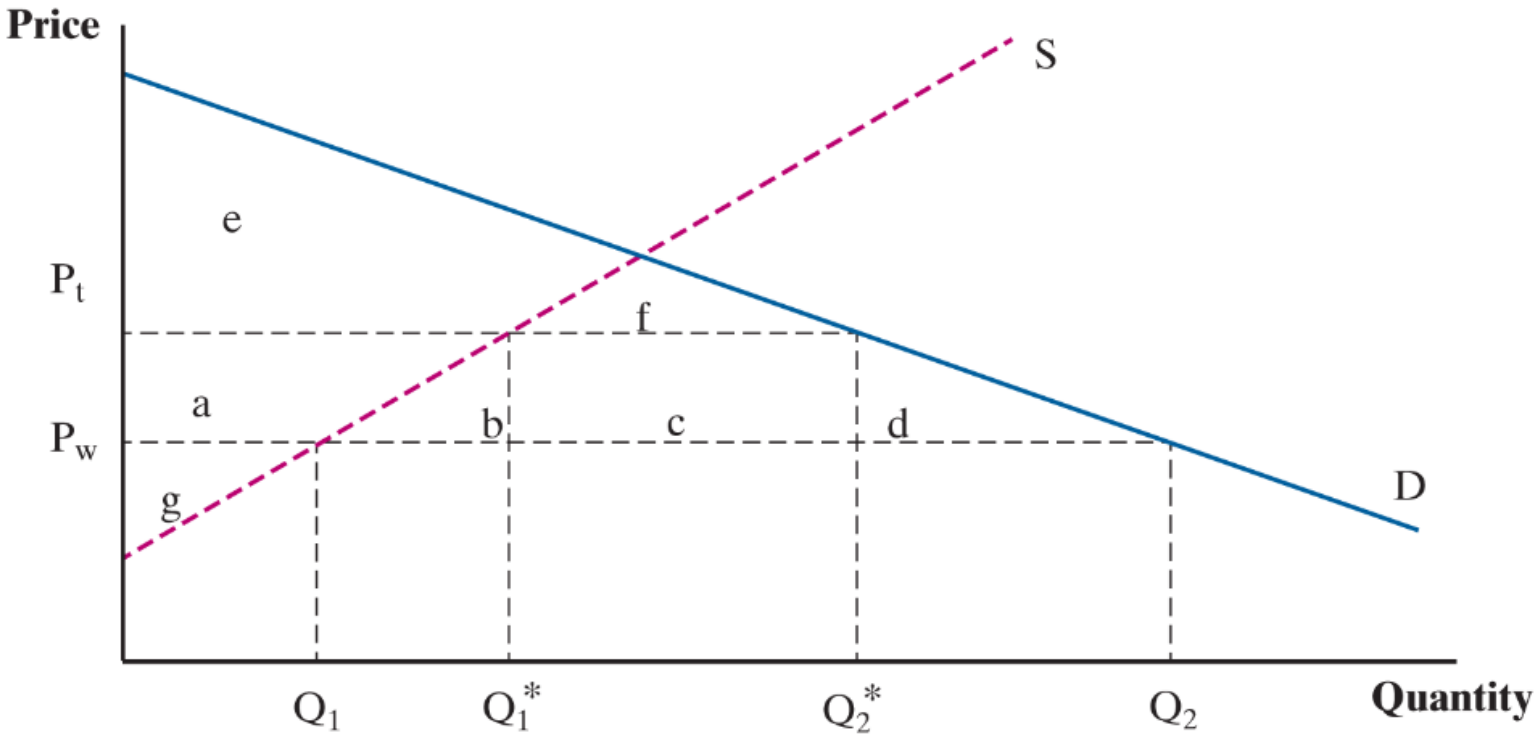

Government collects revenue t times the number of imports

$c = t \times [Q_2^* - Q_1^*]$ transferred from consumers to govt

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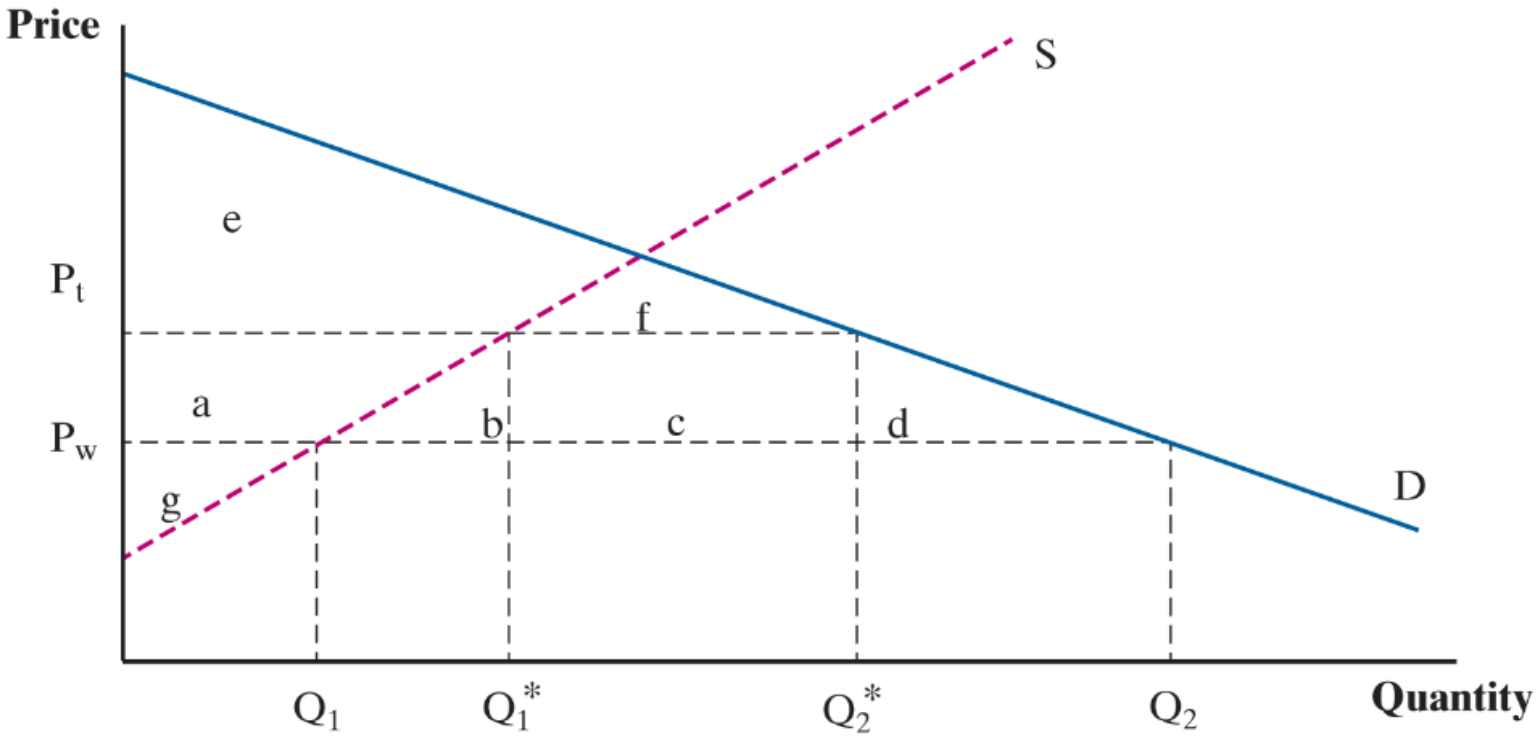

Consumers lost $a + b + c + d$, other parties gained a & c

Societal net loss of $b + d$ where d is **deadweight loss** and b is **efficiency loss**

Tariff Analysis

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> Loss associated with producing additional goods at an excessive cost, relatively to how much it would have cost the rest of the world to generate these goods.

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- Innovation and productivity (less competition)
- Import/Export interdependencies within country
- Rent seeking behaviour (lobbying)

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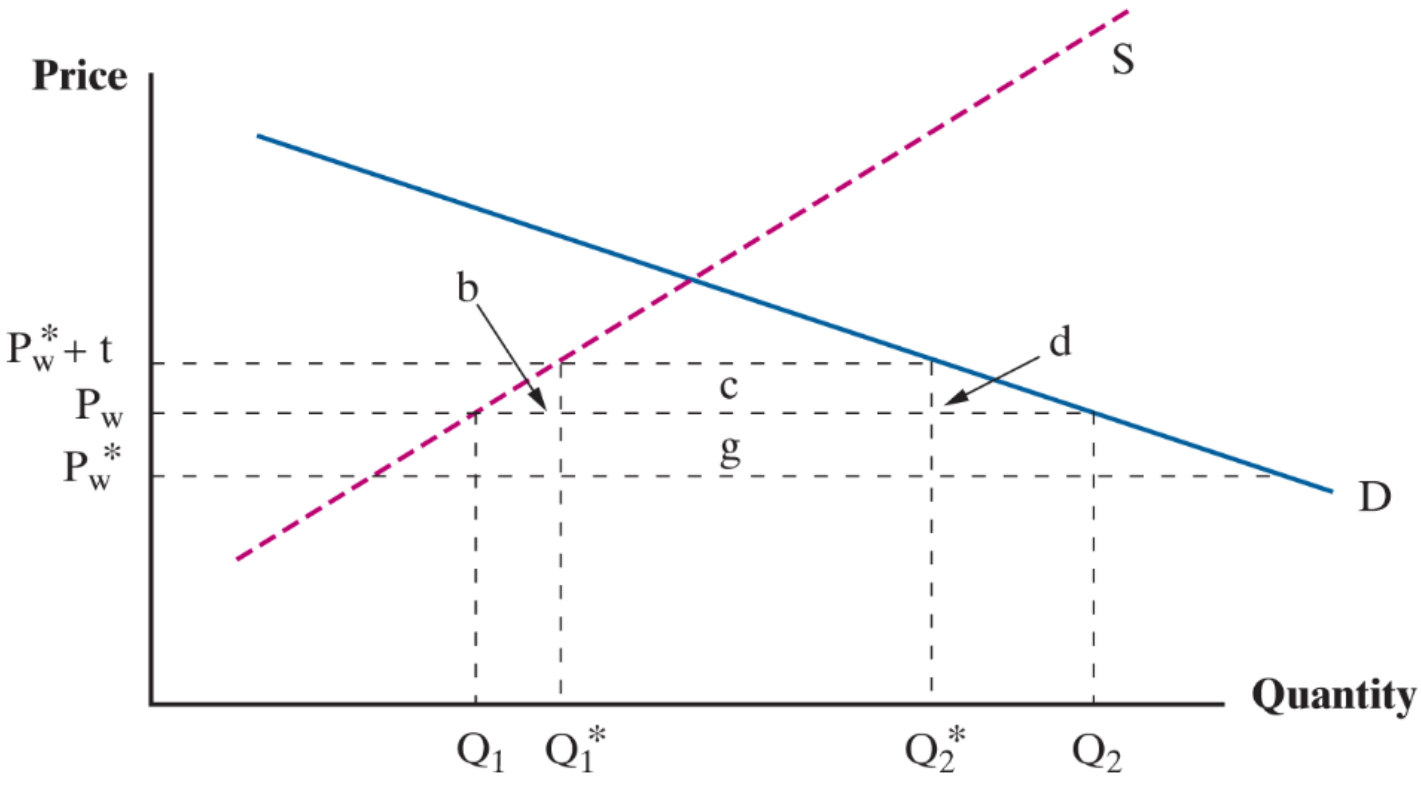
- Tariff adjustment triggers price reduction by exporter country (rest of world)
- Fall in Home country demand lowers P_w to P_w^*. Home price becomes $P_t^* = P_w^* + t$
- Price reduction offsets some of the deadweight loss caused by tariff introduction

Tariff Analysis: Large Country



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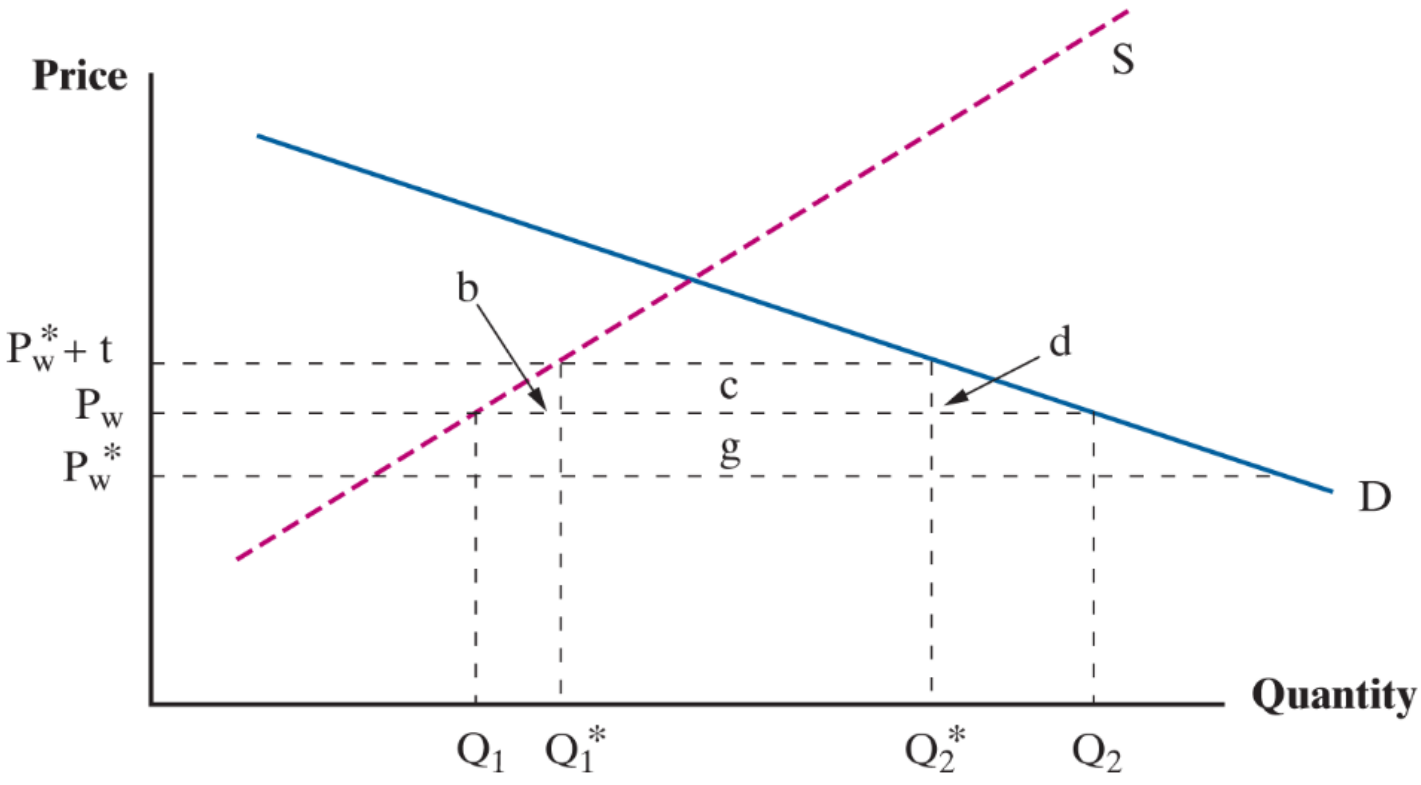
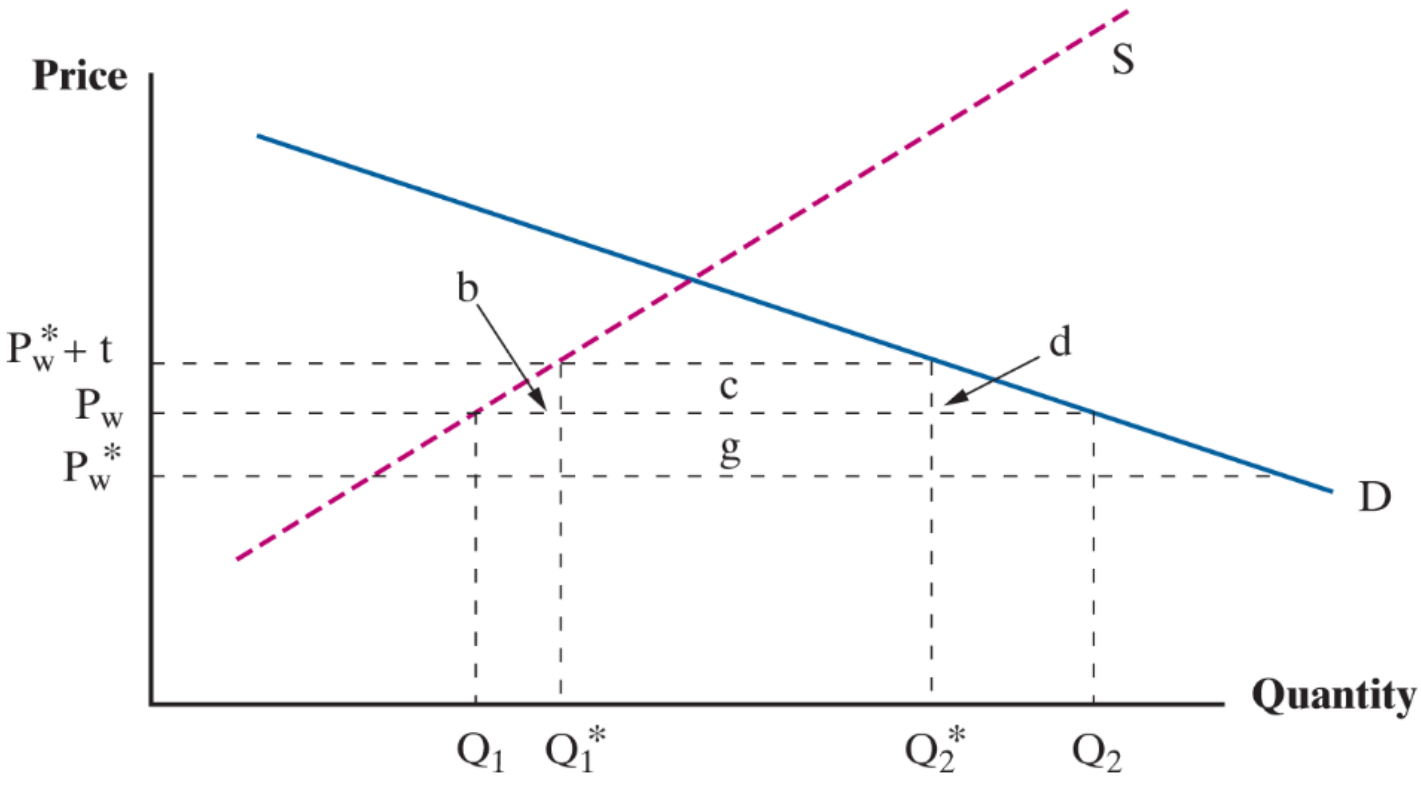


What happens to overall economic welfare following tariff introduction?

Tariff Analysis: Large Country



Lower price implies areas b and d are smaller and domestic production grows by a lower scale. If $g > b + d$ then tariff was **welfare enhancing**.

Key Topics

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- **Compare tariff data on inputs and outputs to compare effective and nominal protection levels**
- Comparing the **impact of quotas** relative to tariff rate adjustments
- Highlight forms of protection **difficult to observe**
- New **unconventional methods** of protectionism

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Nominal rate of protection: The amount of a tariff expressed as a percentage of a good's price. This is the tariff we have discussed so far.

Effective rate of protection: Level of protection on intermediate inputs and nominal tariff levied on protected good. Measured as percentage change in domestic value added after tariffs on intermediate and final goods applied.

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- VA is domestic value-added under free trade
- VA^* is VA after accounting for all relevant tariffs

Inputs & Outputs

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Suppose we introduce **two tariffs** in sequence

Variable	No Tariff	40% Tariff, Final Good	+10% Tariff, Intrm. Good
Domestic Price of Good, VA*	5000	7000.0	7000.0
Value of Imported Input	400	400.0	440.0
Domestic Value-Added, VA	4600	6600.0	6560.0
Effective RP, %	0	43.5	42.6

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Sufficiently high import reliance can make tariff protection yield **negative protection measure**, depending on the good examined.

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Upcoming homework expects you to yield examples of such outcomes.

To summarise:

- Tariffs are bad for countries with little influence on world prices
- Large countries exhibit an ambiguous effect
- Tariff protection can backfire, depending on input reliances

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Next time

Discuss quotas, difficulties in observing protectionism and unconventional methods used