

Lecture 8a:

Tariffs in a small economy

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C181 – International Trade

Spring 2018

1- Introduction

These coming lectures (Feenstra and Taylor ch. 8):

1. How large are tariffs?
2. Is it beneficial to set a positive tariff on imports?
3. Two cases:
 - Small economies taking prices as given
 - Large economies
4. Global strategy to reduce tariffs worldwide?

1- Introduction

What is a tariff?

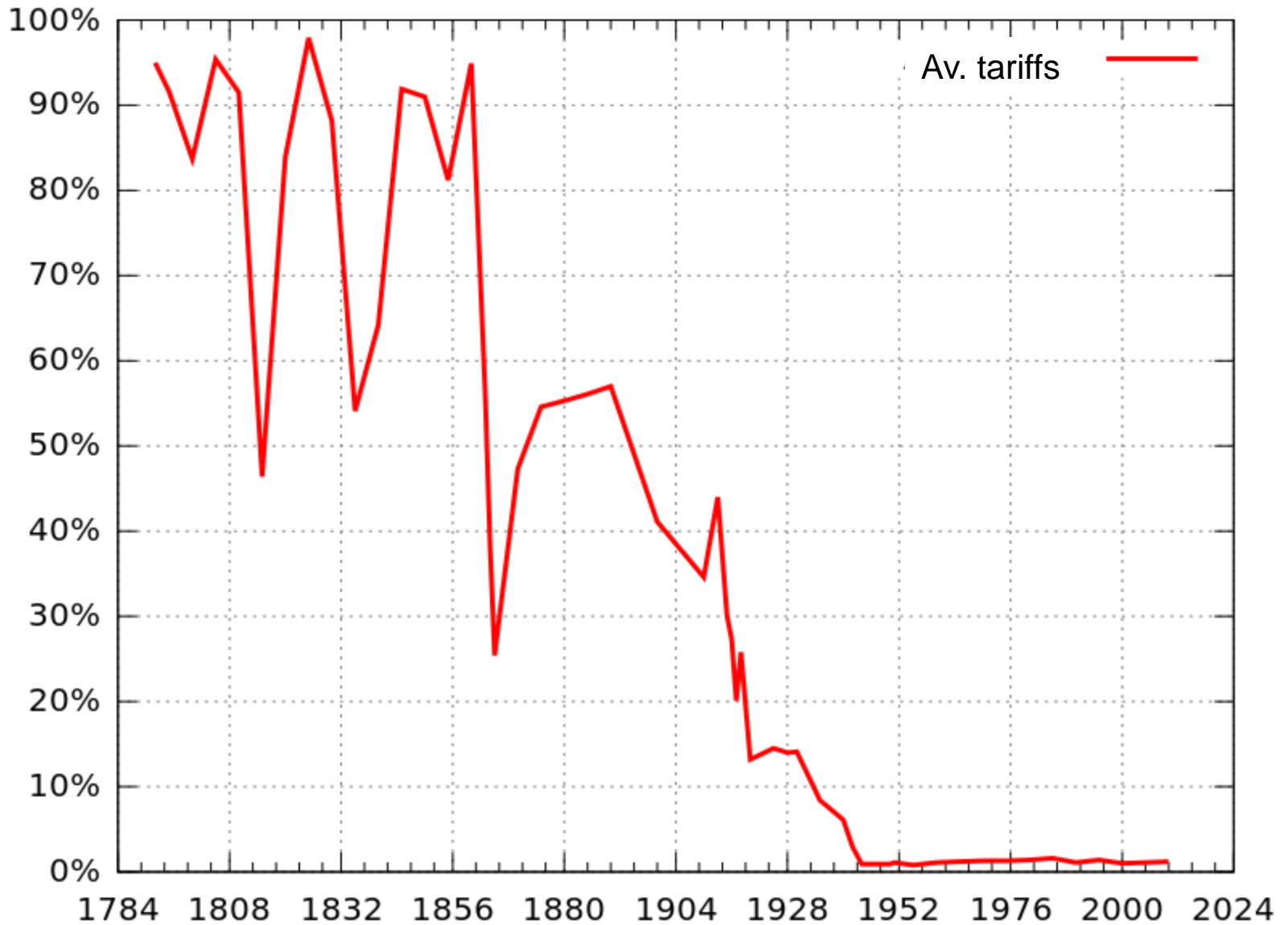
- Definition: tariff = tax on imports
 - Can be a tax in dollars (e.g. $P = \$6 + \2tax)
...or “ad valorem” (% tax on value of imports)
 - **Note:** There are other trade barriers (such as quotas) but effect usually similar to a tariff:
- useful to start with a discussion of the effect of tariffs

1- Introduction

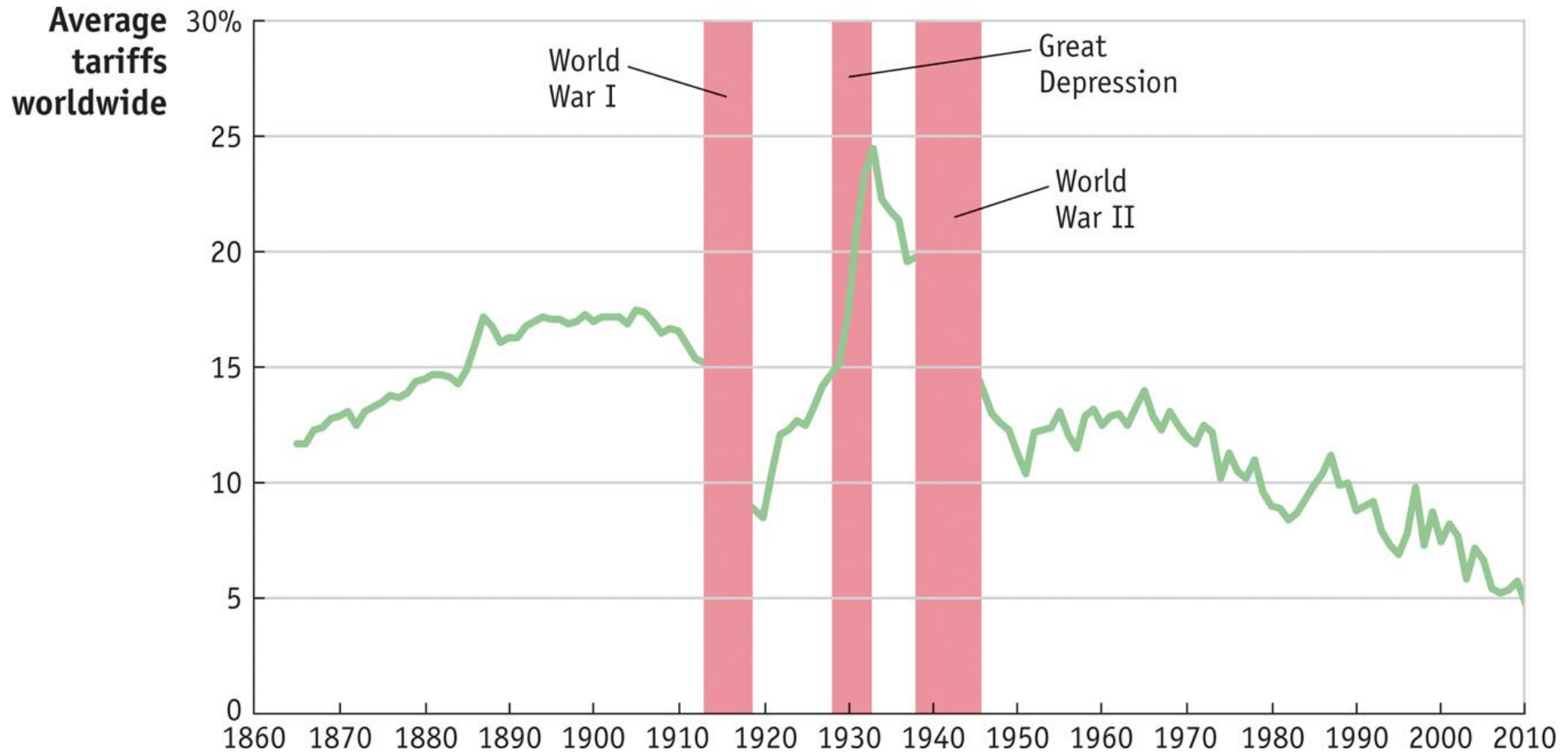
How large are tariff?

- Tariffs were very high historically

Average US tariffs

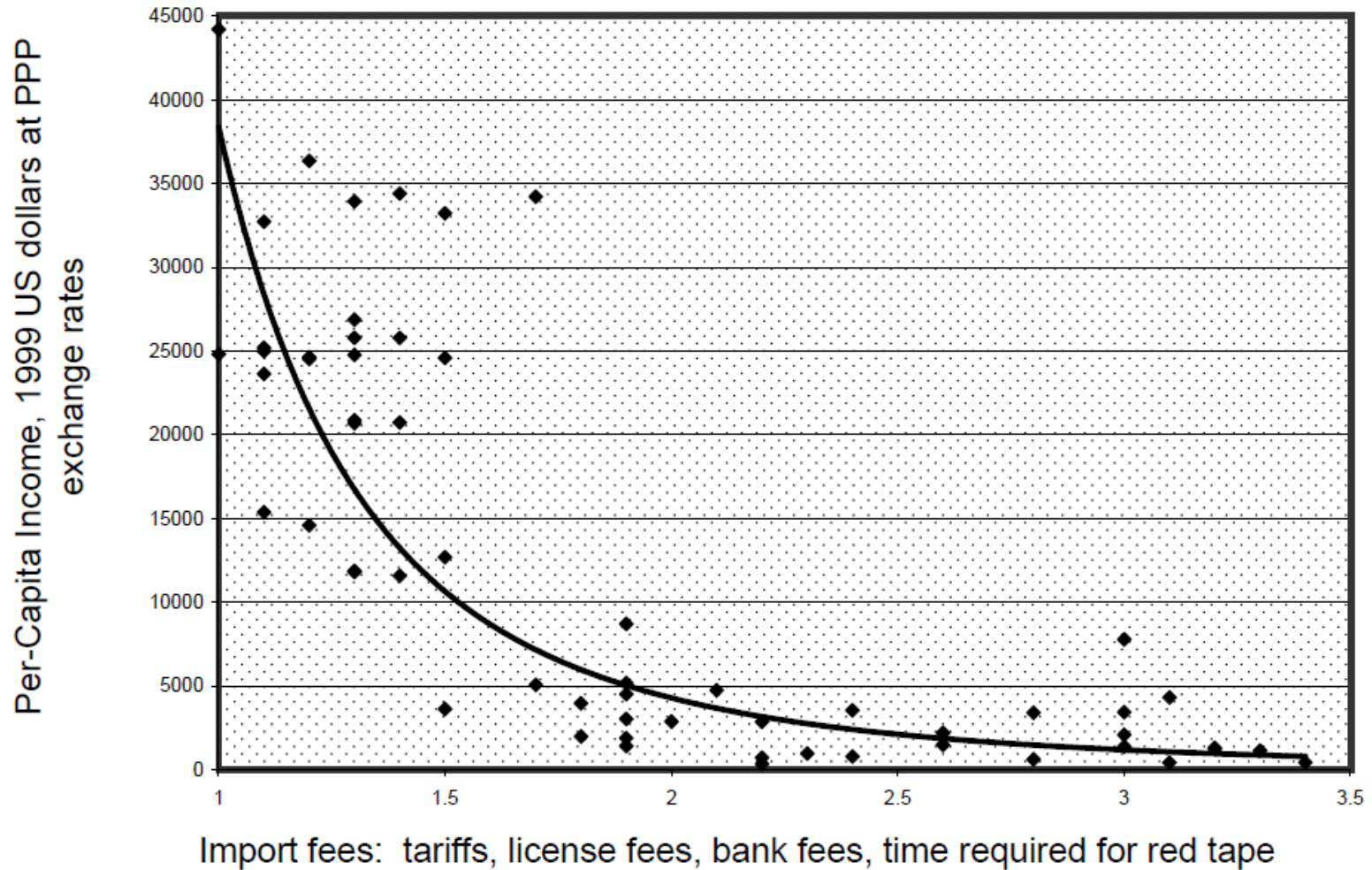


Average US tariffs



Tariffs and other trade barriers

Per-Capita Income as a Function of Trade Barriers



1- Introduction

How large are tariff?

- Tariffs were very high historically
- Low on average in rich countries but there are exceptions if we look more closely across industries

... Especially food items

1- Introduction

How large are tariff?

- Tariffs were very high historically
- Low on average in rich countries but there are exceptions if we look more closely across industries
 - ... Especially food items
- Tariffs are now often imposed on a temporary basis (e.g. recently to protect US steel and tire industries)

2- Tariffs in a small economy

Setup

- Perfect competition
- Partial equilibrium: looking at a specific industry, no effect on wages
- General setup to account for effects on two sides:
 - Consumer surplus
 - Producer surplus
- Small open economy: *constant international price*

2- Tariffs in a small economy

Objective

- Offers simple tools to evaluate/quantify effects of tariffs
- The same tools are being used by the ITC in DC:
(ITC: International Trade Commission)
- ITC's mission is to inform US policy makers on quantitative impacts of tariffs across industry
- Notes: tariffs often set up at the "HS 6" level
= same level of disaggregation as in Problem Set 5

2- Tariffs in a small economy

Gains from tariffs?

- What we have seen so far:
- *In most the trade models:*
 - Both countries gain from trade compared to autarky
- Same conclusion here?
 - Not obvious: tariffs generate revenues.
 - Gains to be redistributed from/to consumers/producers?

2- Tariffs in a small economy

Review: consumer surplus

(a) Consumer Surplus

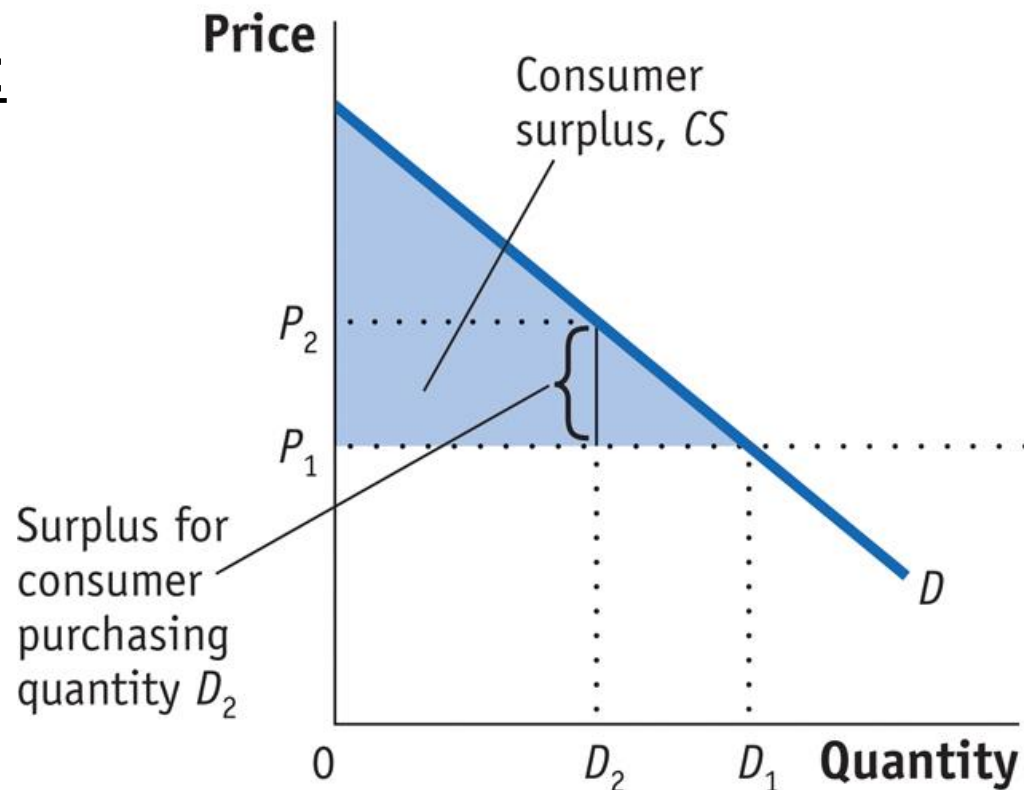
- For a small change in price:

$$\Delta(\text{consumer surplus}) \approx Q \times \Delta(\text{price})$$

- More generally:

Consumer surplus

= Area between the demand curve and price



(blue area above!)

2- Tariffs in a small economy

Review: **producer surplus**

- For a small change in price:

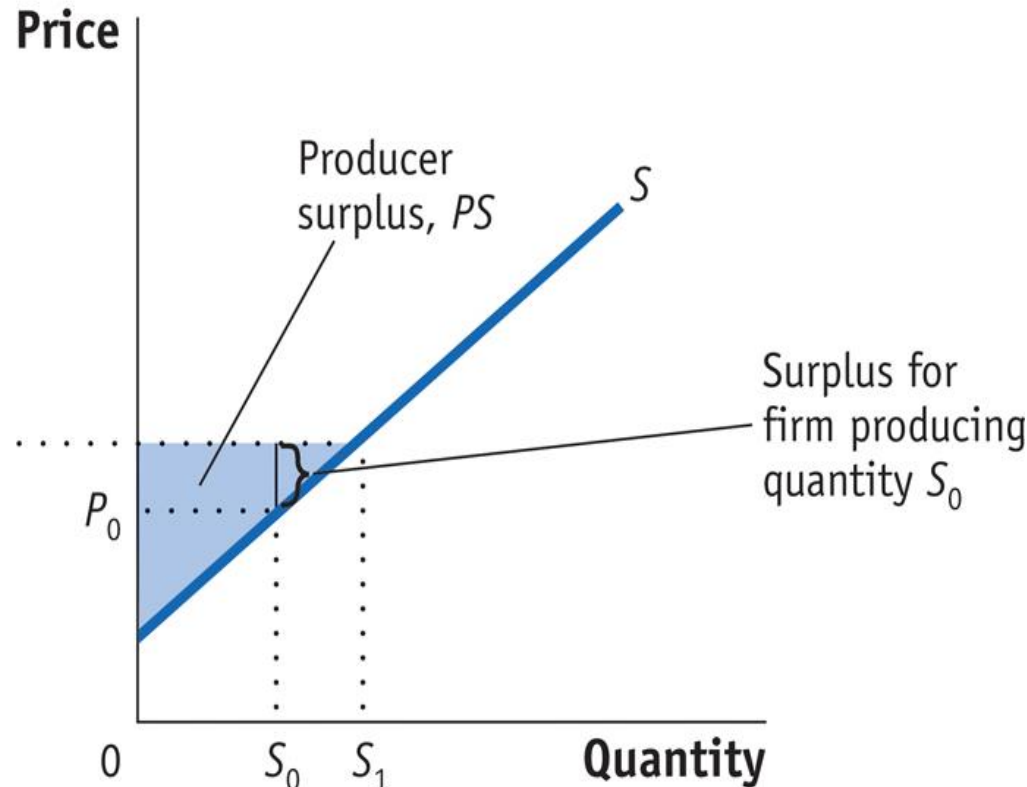
$$\Delta(\text{producer surplus}) \approx Q \times \Delta(\text{price})$$

- More generally:

Producer surplus

= Area between the **supply** curve and price

(b) Producer Surplus

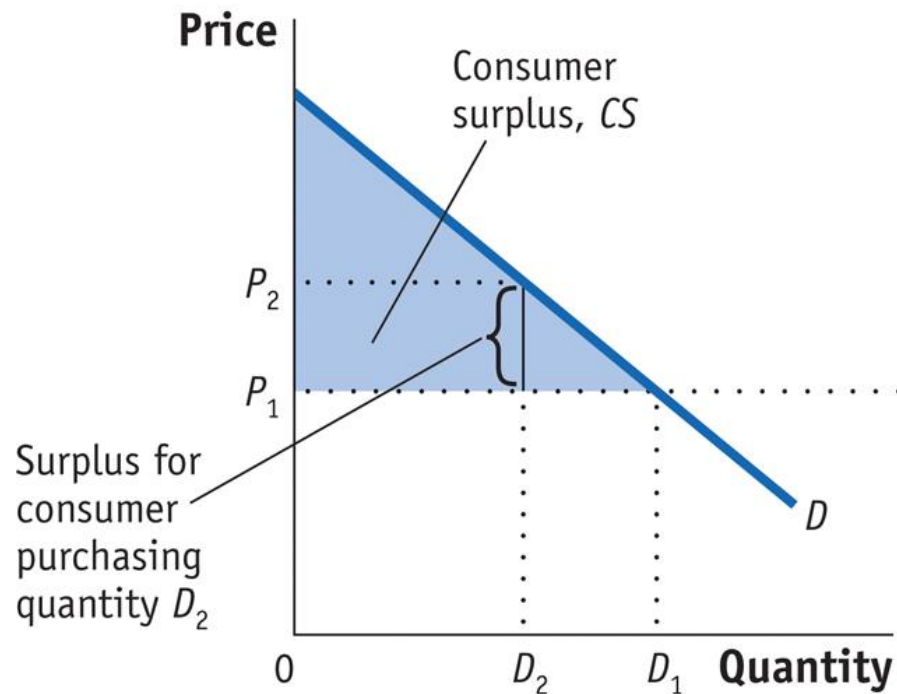


(blue area above!)

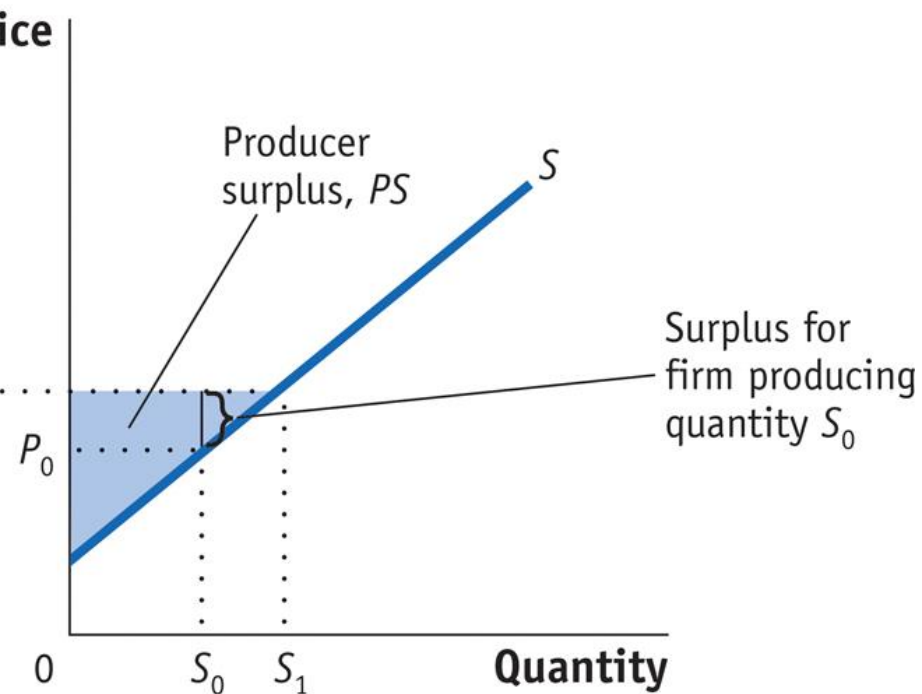
2- Tariffs in a small economy

Side by side:

(a) Consumer Surplus



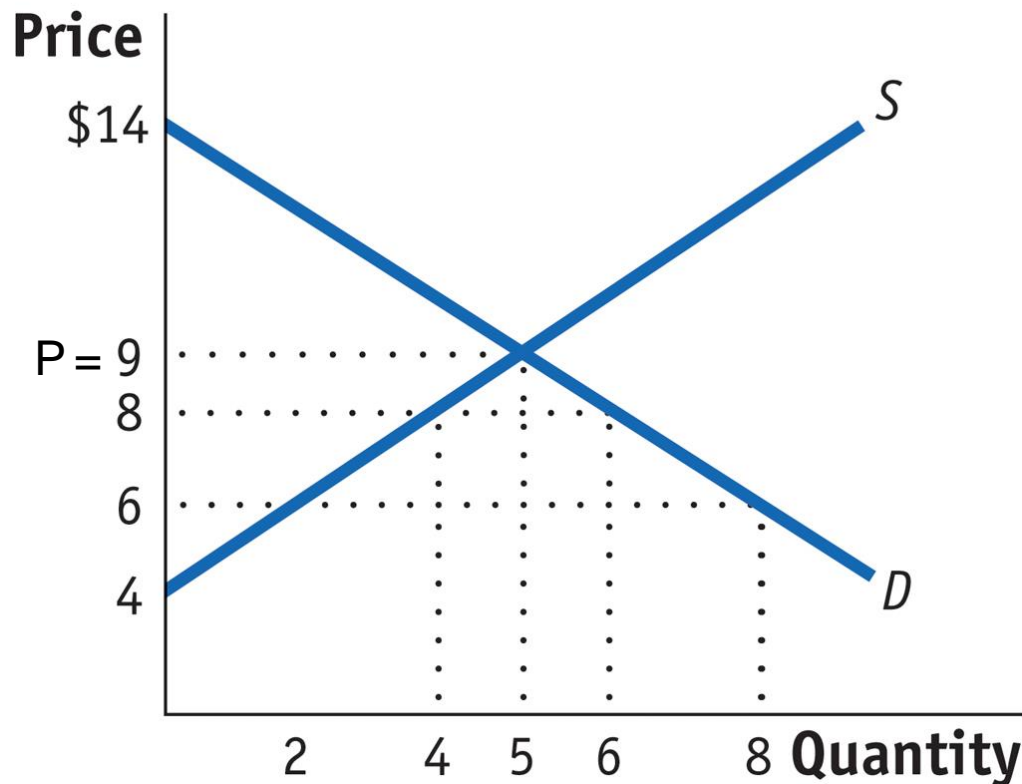
(b) Producer Surplus



2- Tariffs in a small economy

Numerical example: AUTARKY

Consumer surplus at $P=\$9$?

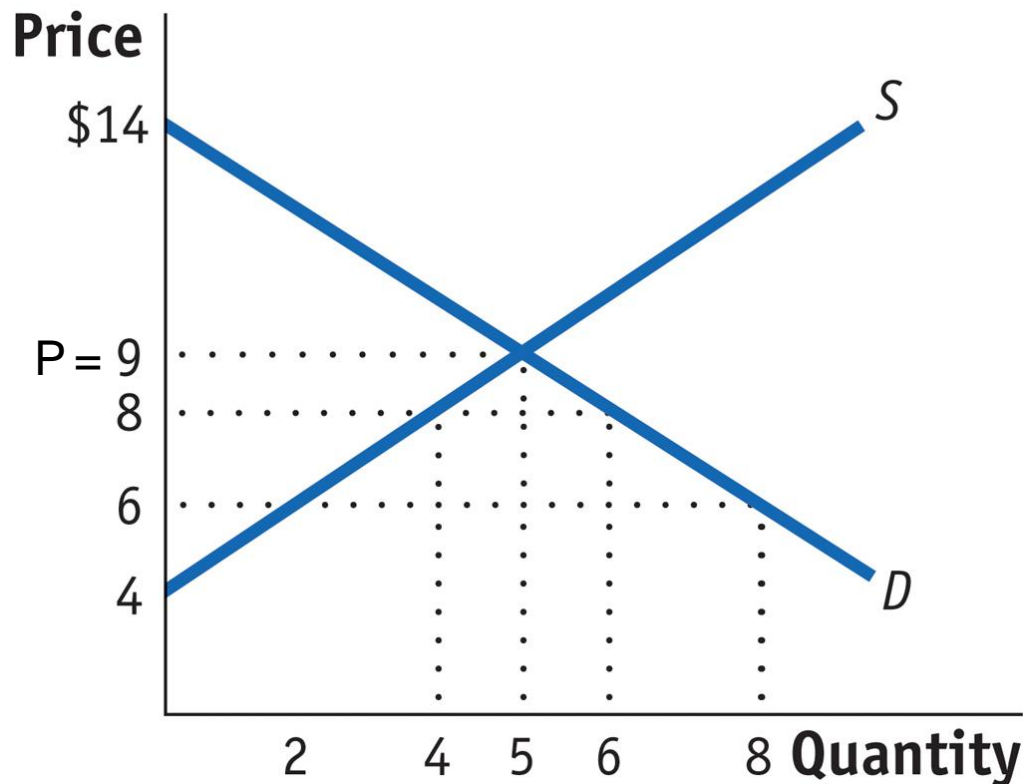


- a) \$9
- b) \$10
- c) \$12.5
- d) \$22.5
- e) \$45
- f) \$50
- g) \$1,000,000

2- Tariffs in a small economy

Numerical example: AUTARKY

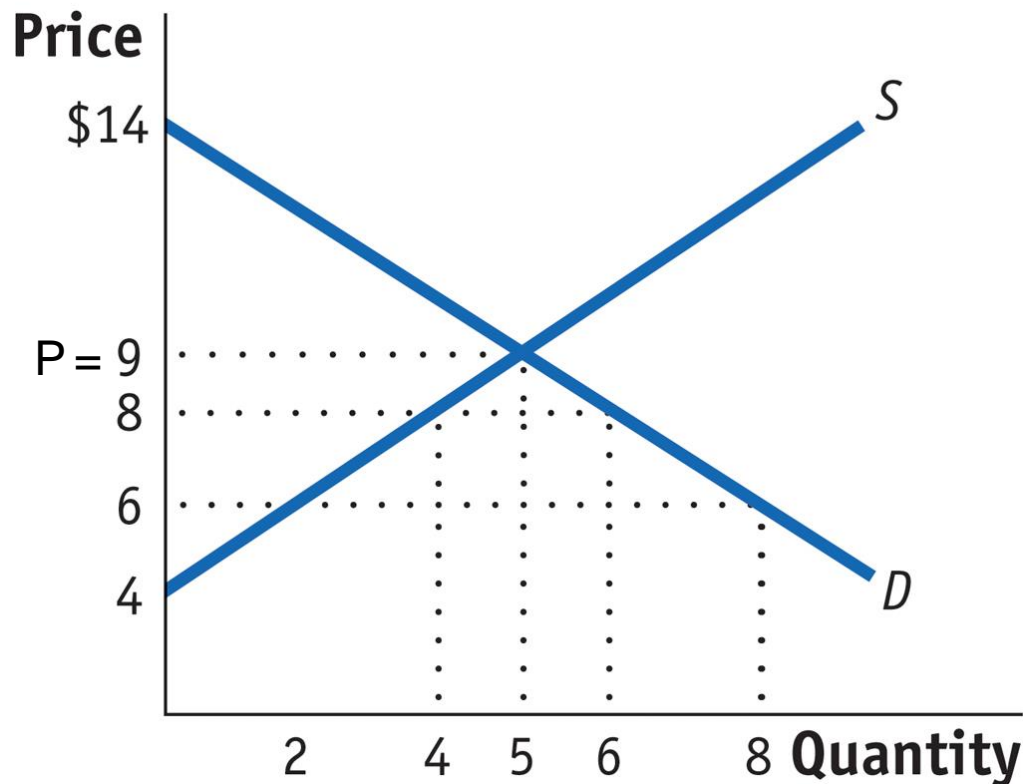
$$\text{Consumer surplus} = \frac{1}{2} \times (\$14 - \$9) \times 5 = \mathbf{\$12.5}$$



2- Tariffs in a small economy

Numerical example: AUTARKY

Producer surplus at $P=\$9$?

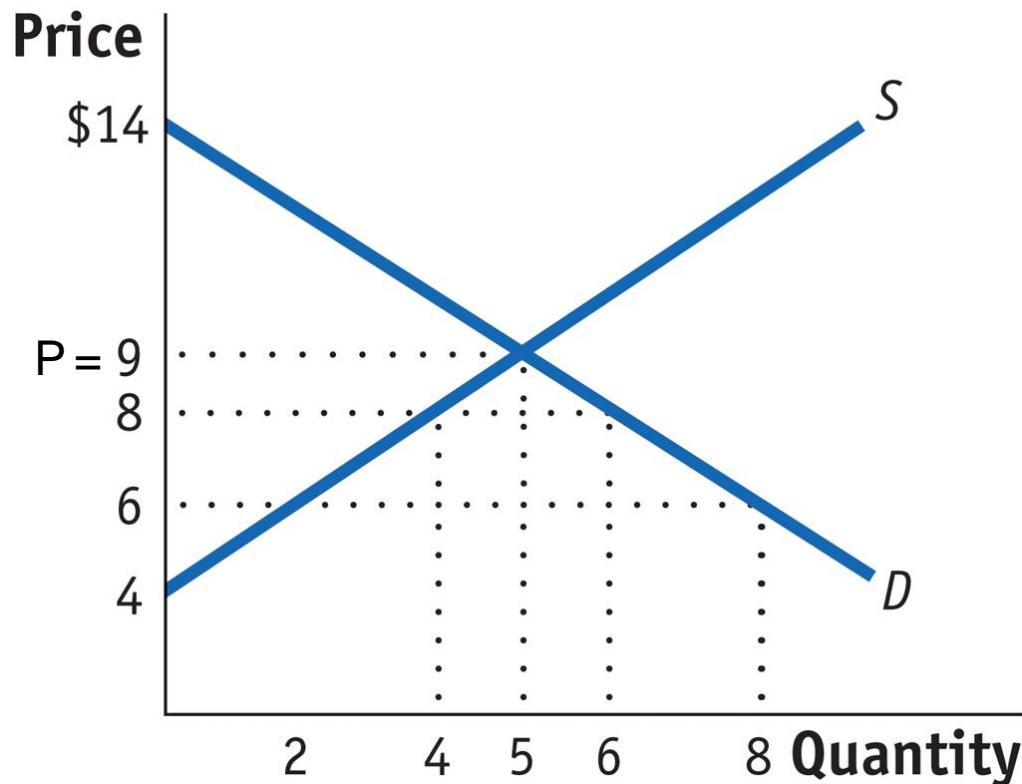


- a) \$9
- b) \$10
- c) \$12.5
- d) \$22.5
- e) \$45
- f) \$50
- g) \$1,000,000

2- Tariffs in a small economy

Numerical example: AUTARKY

$$\text{Producer surplus} = \frac{1}{2} \times (\$9 - \$4) \times 5 = \mathbf{\$12.5}$$

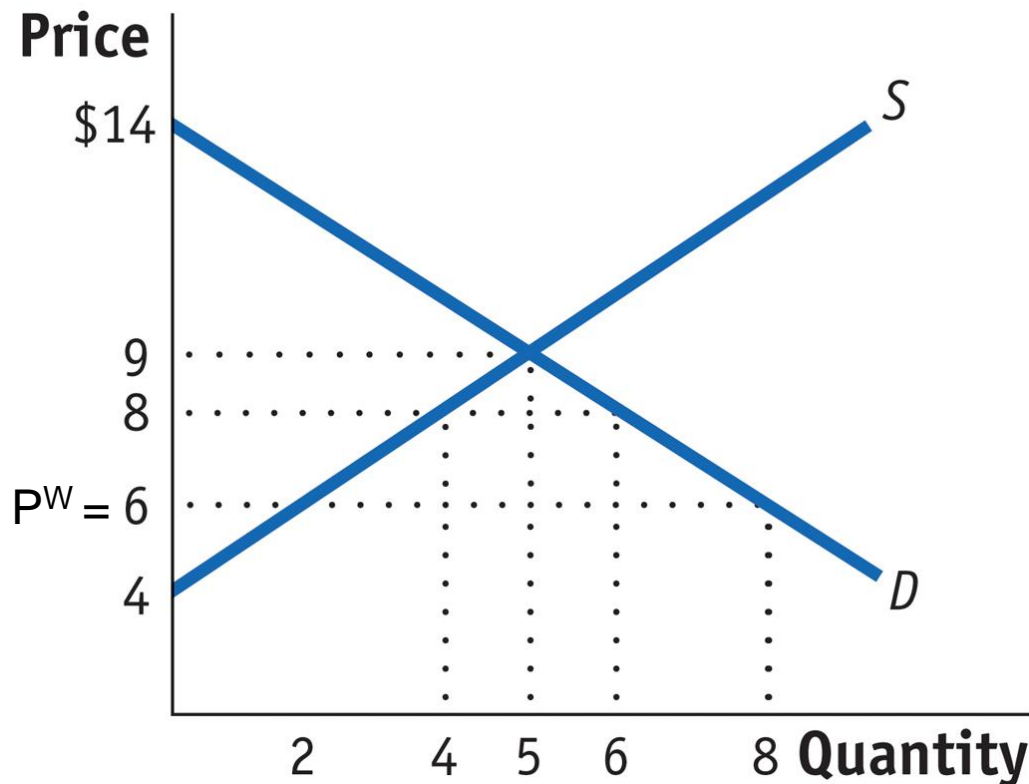


(coincidence!)

2- Tariffs in a small economy

Numerical example: IMPORT case

Consumer surplus at $P=\$6$?

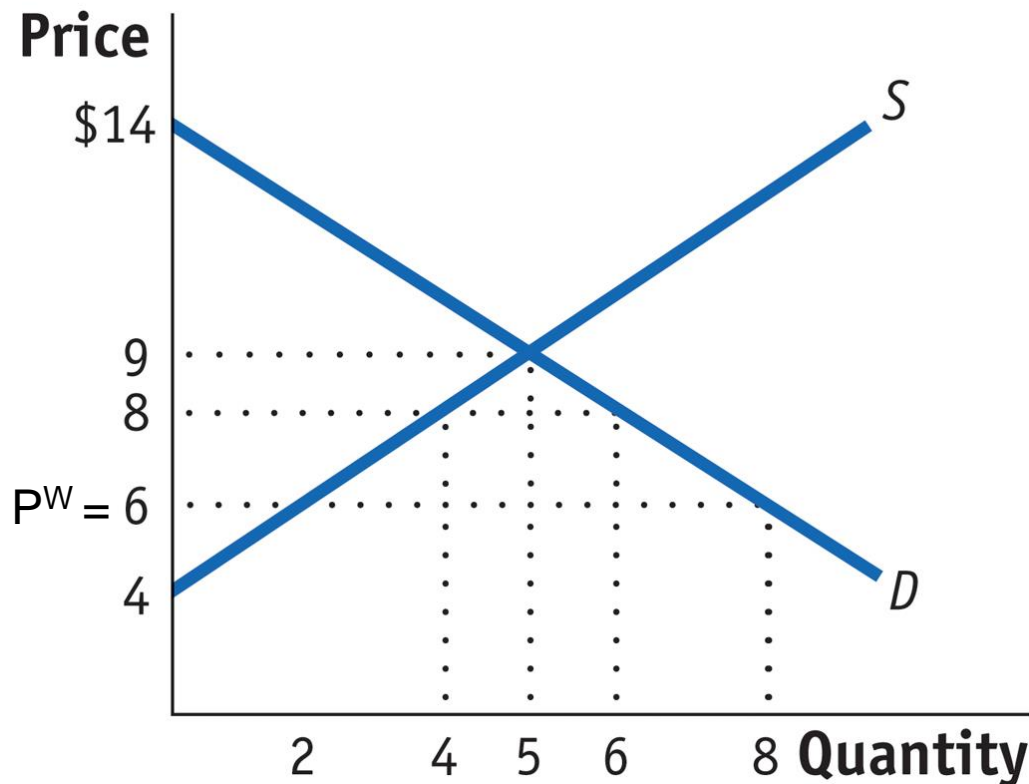


- a) \$2
- b) \$8
- c) \$16
- d) \$32
- e) \$64
- f) \$128
- g) \$256

2- Tariffs in a small economy

Numerical example: IMPORT case

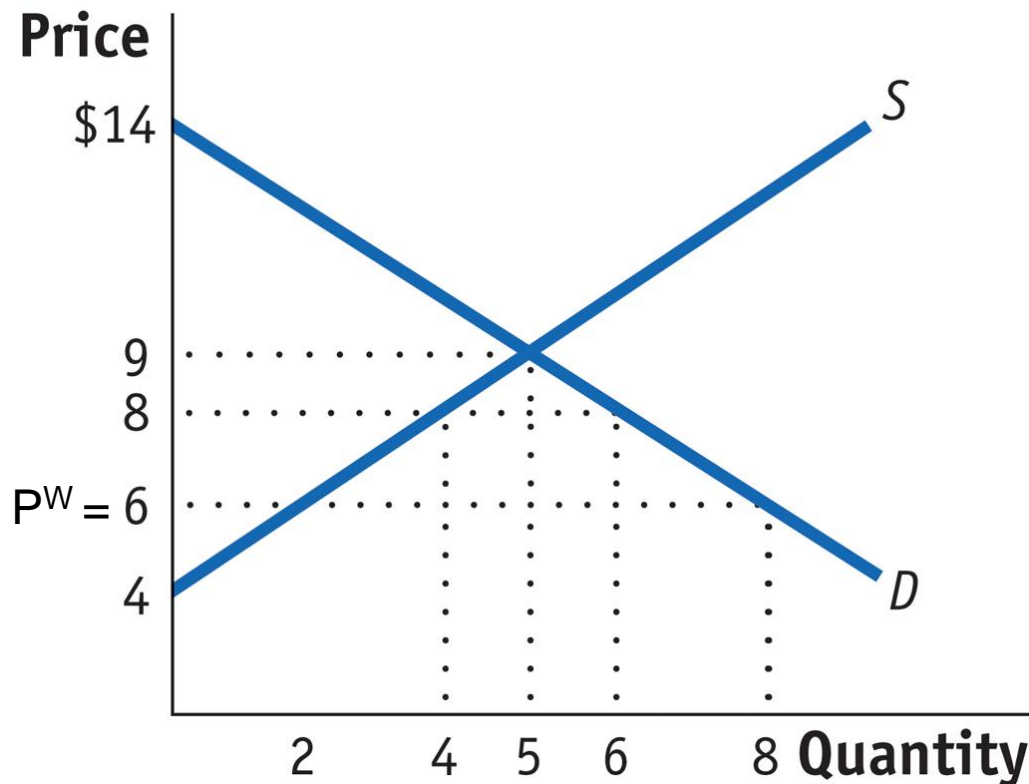
$$\text{Consumer surplus} = \frac{1}{2} \times (\$14 - \$6) \times 8 = \mathbf{\$32}$$



2- Tariffs in a small economy

Numerical example: IMPORT case

Producer surplus at $P=\$6$?

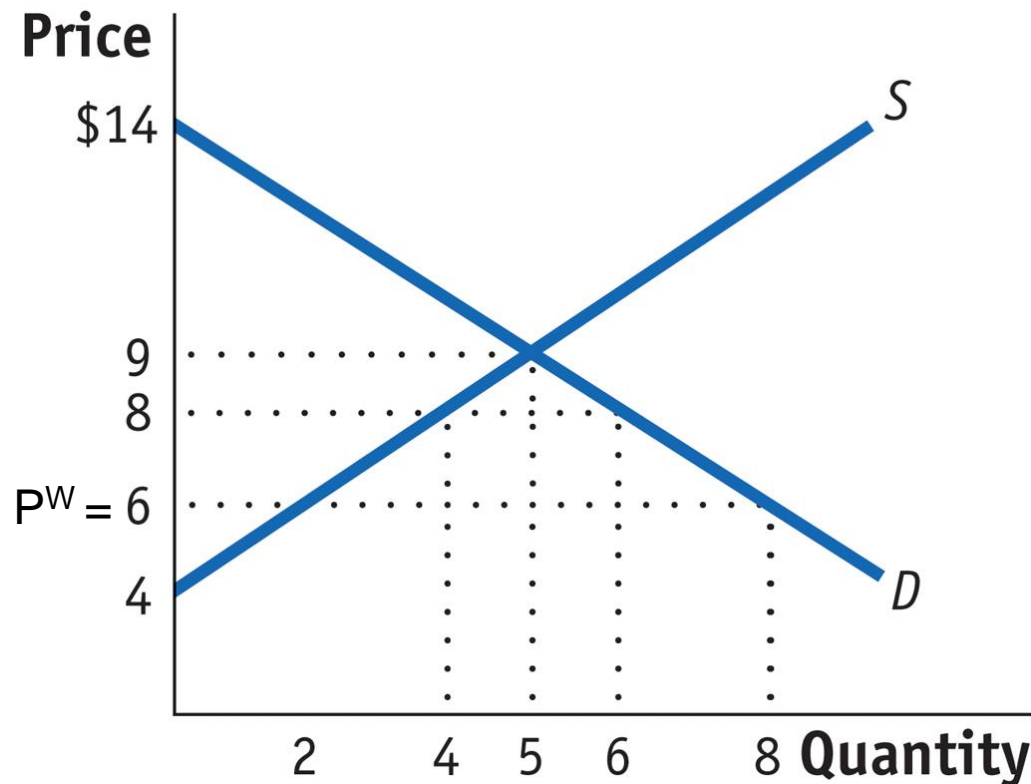


- a) \$2
- b) \$8
- c) \$16
- d) \$32
- e) \$64
- f) \$128
- g) \$256

2- Tariffs in a small economy

Numerical example: IMPORT case

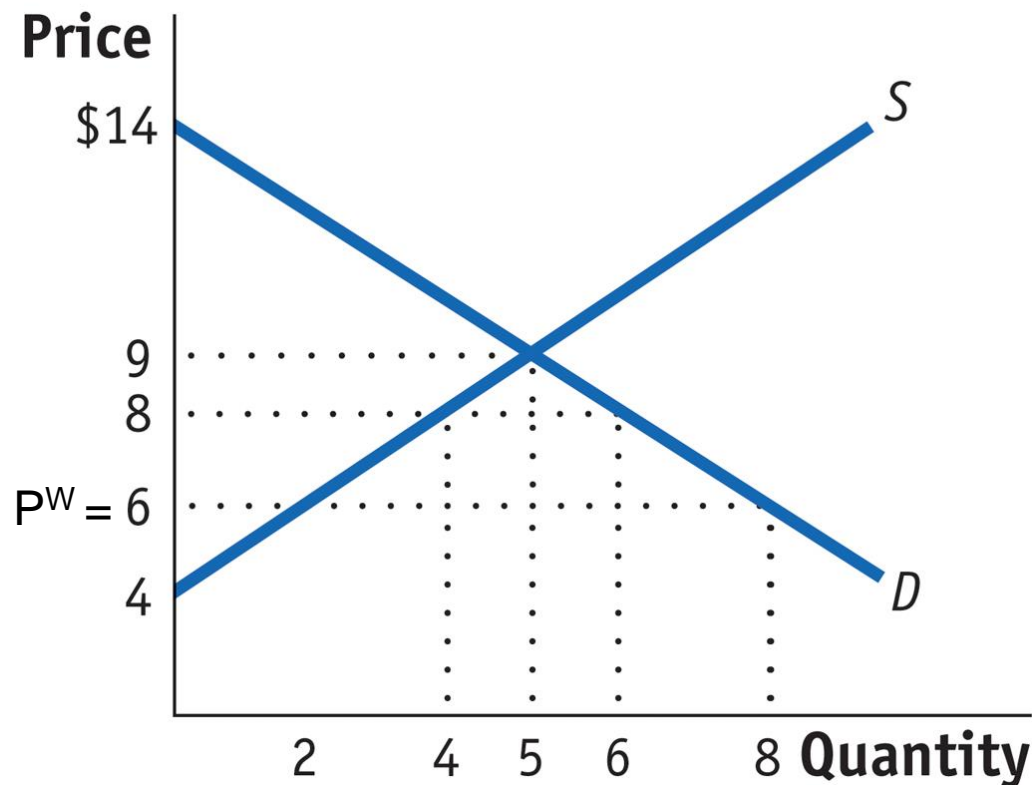
Producer surplus = $\frac{1}{2} \times (\$6 - \$4) \times 2 = \mathbf{\$2}$



2- Tariffs in a small economy

Numerical example: IMPORT case

Gains from trade at $P = \$6$?



- a) - \$9 (loss)
- b) - \$5 (loss)
- c) \$0
- d) \$5
- e) \$9
- f) \$45
- g) \$100,000,000

2- Tariffs in a small economy

Numerical example: IMPORT case

Gains from trade

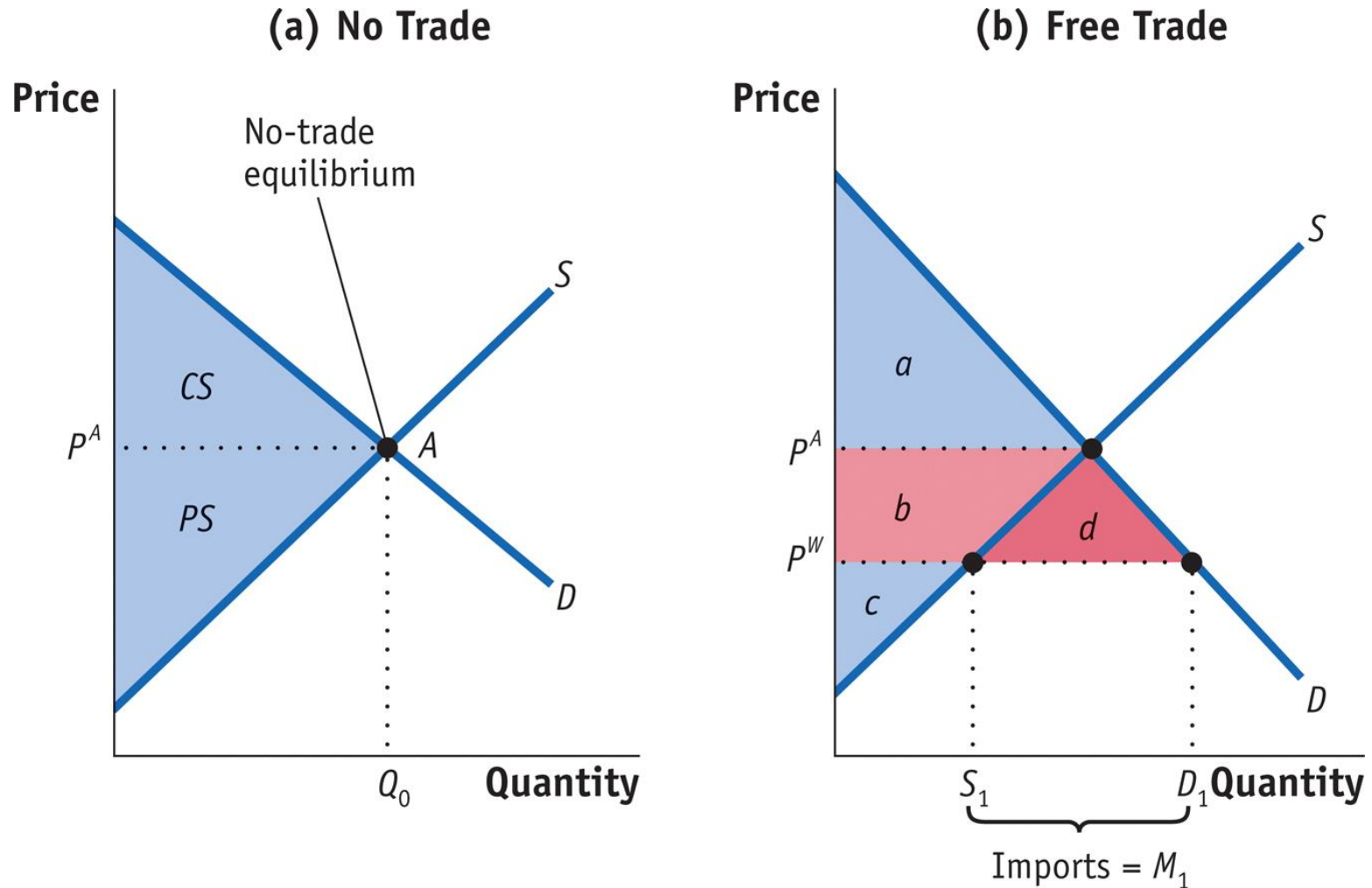
= increase in consumer surplus – decrease in producer surplus

$$= (\$32 - \$12.5) - (\$12.5 - \$2)$$

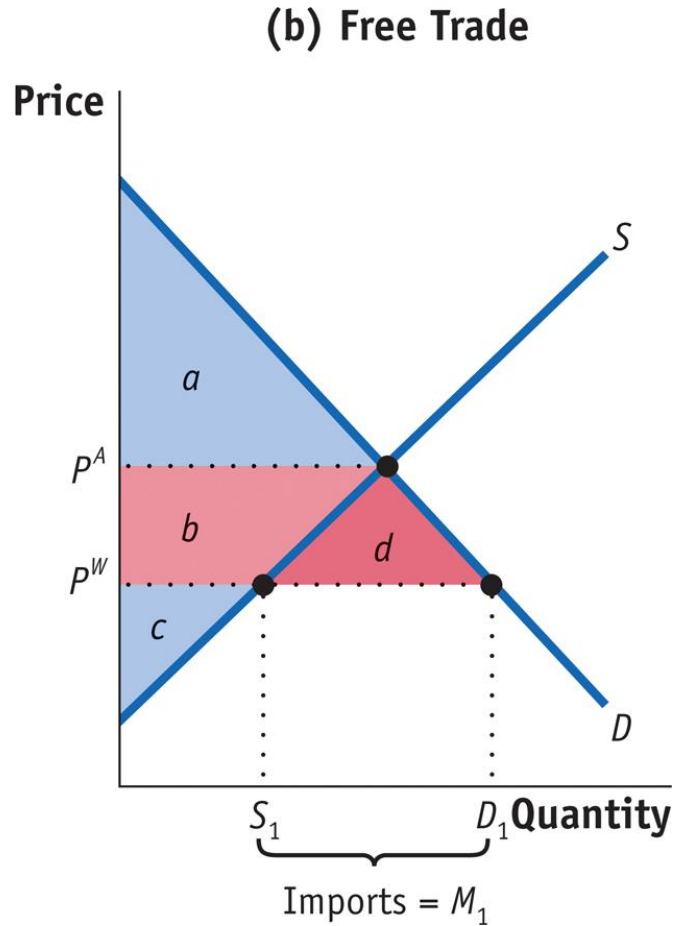
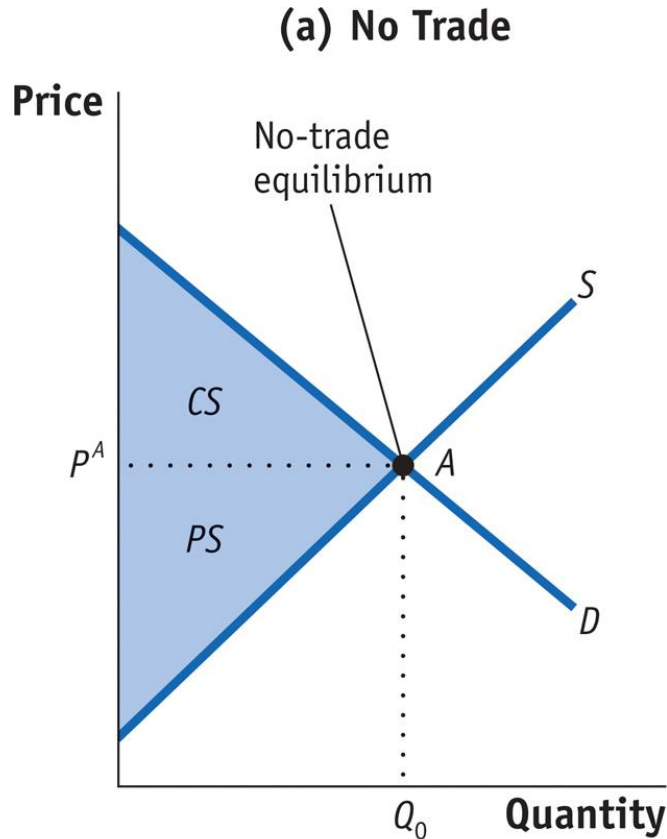
$$= \$9$$

2- Tariffs in a small economy

Gains from going from Autarky to trade:



Gains from going from Autarky to trade:



Gains from trade

= increase in consumer surplus – decrease in producer surplus

= **(b + d) - (b)**

= **d**

2- Tariffs in a small economy

Effect of tariffs?

Account for:

- change in consumer surplus
- change in producer surplus
- Tariff revenues

2- Tariffs in a small economy

Clicker question

Suppose that a small open economy sets up a tariff. This leads to:

- a) An **increase in consumer surplus** which offsets the **decrease in producer surplus**
- b) An **increase in consumer surplus** which is offset by the **decrease in producer surplus**
- c) An **increase in producer surplus** which offsets the **decrease in producer surplus**
- d) An **increase in producer surplus** which is offset by the **decrease in consumer surplus**
- e) No change

2- Tariffs in a small economy

Answer

Suppose that a small open economy sets up a tariff. This leads to:

- d) An increase in producer surplus** which is **offset by** the **decrease in consumer surplus**

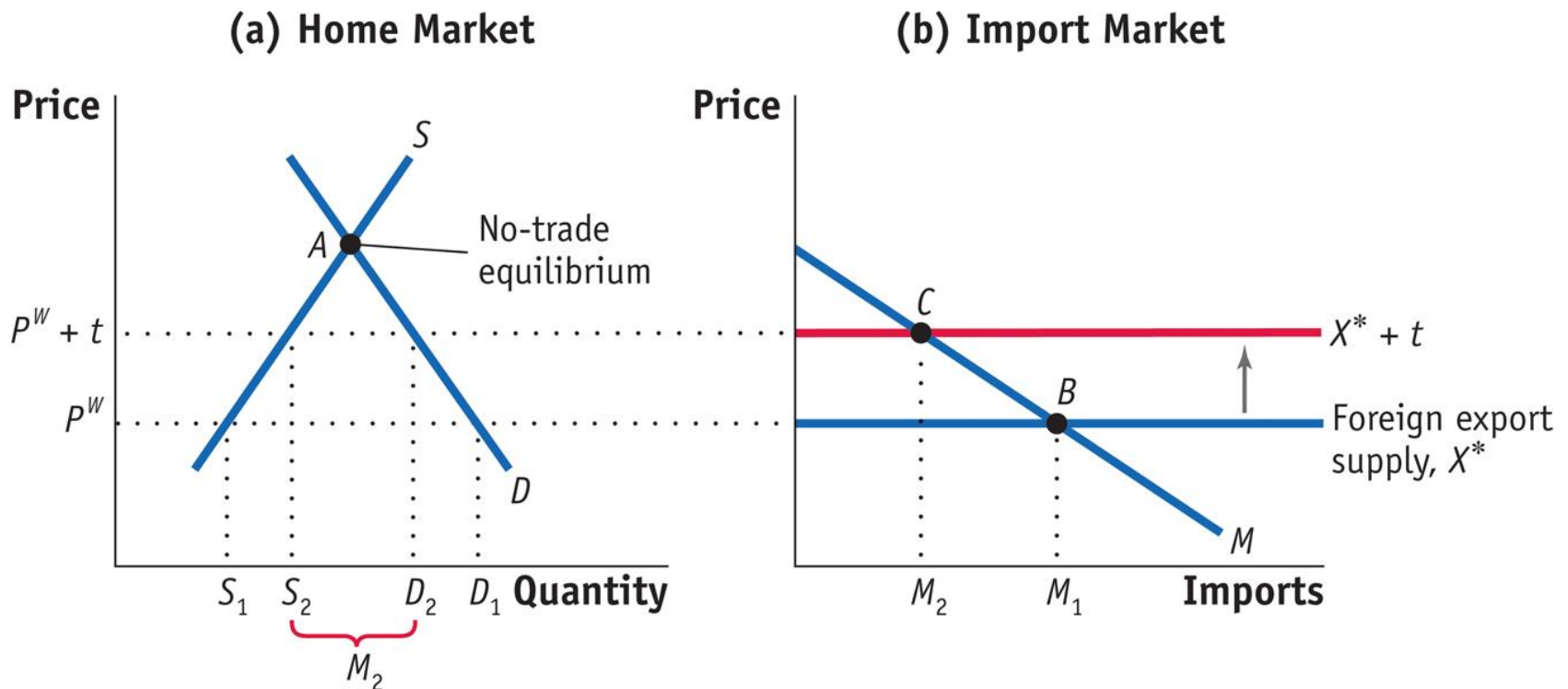
2- Tariffs in a small economy

Effect of tariffs?

First step: effect of the tariff on **prices** and **imports**:

→ Increase in price: P^W to $P^W + t$

→ Decrease in imports: M_1 to M_2

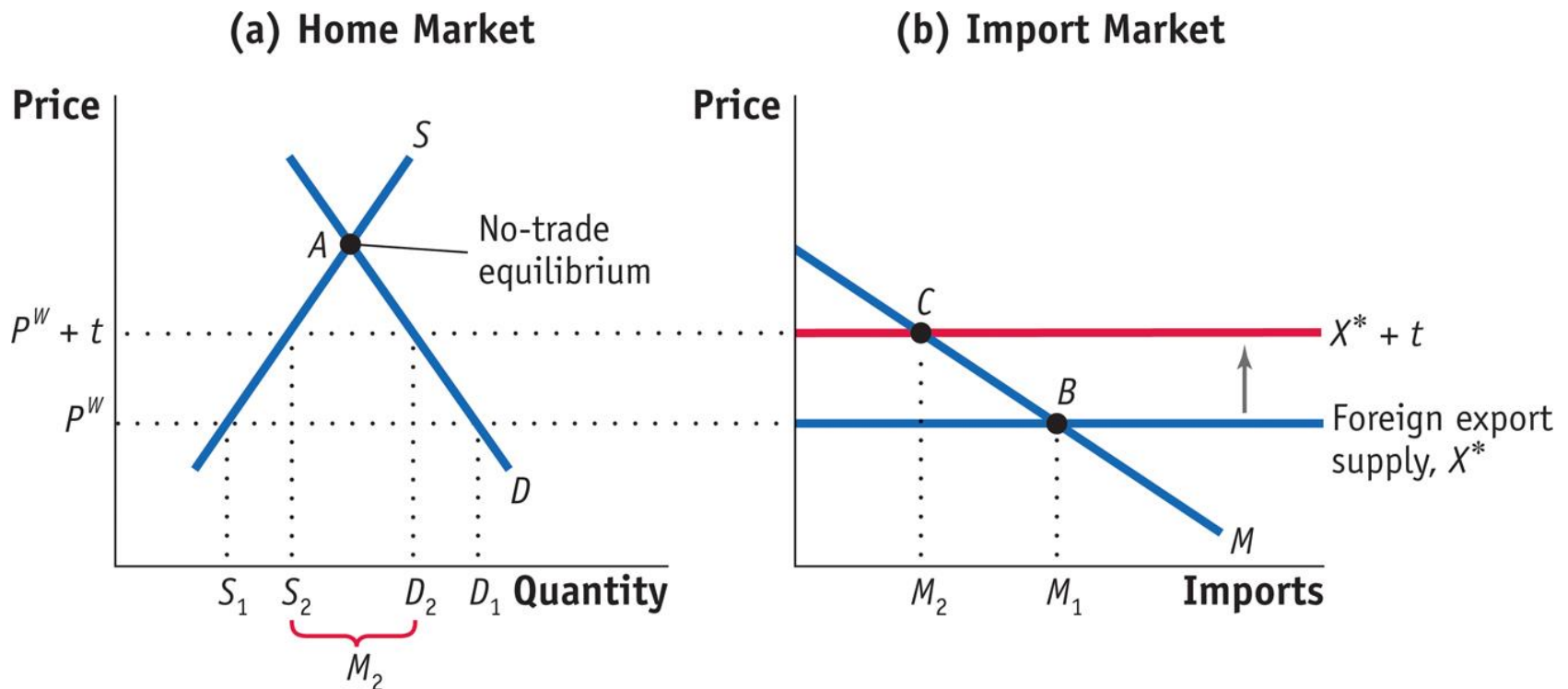


2- Tariffs in a small economy

Effect of tariffs?

Second step: effect of the tariff on:

consumer and **producer** surplus + **tariff revenues**:

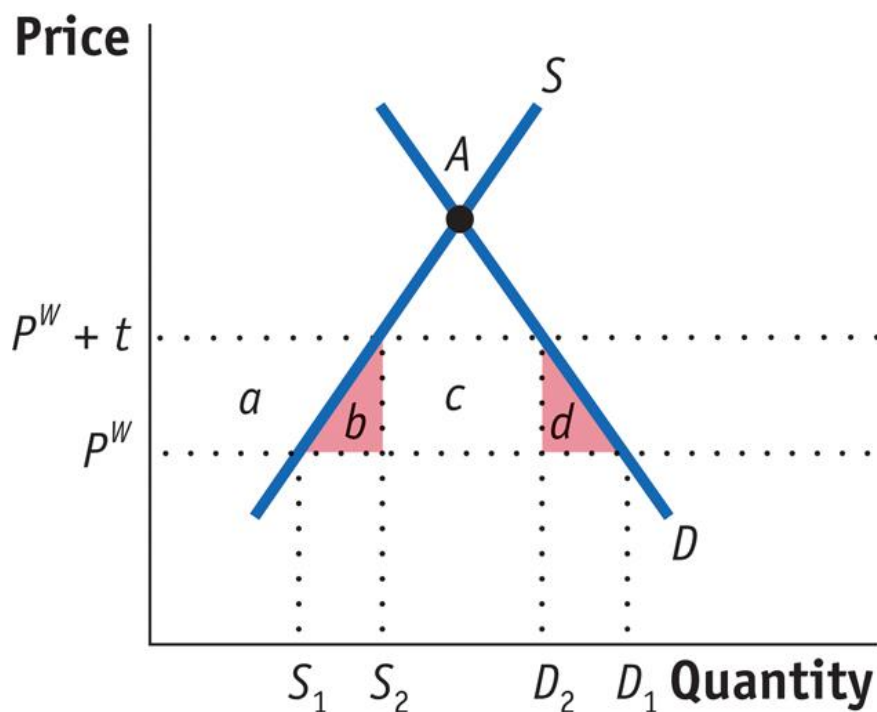


2- Tariffs in a small economy

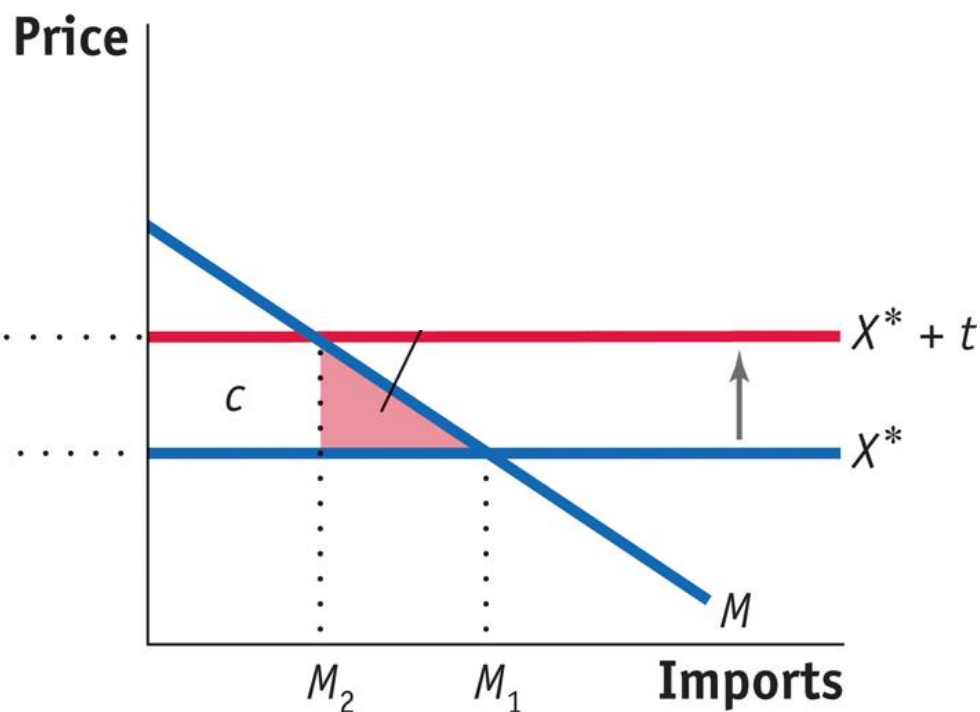
Effect of tariffs?

Decrease in consumer surplus = ?

(a) Home Market



(b) Import Market

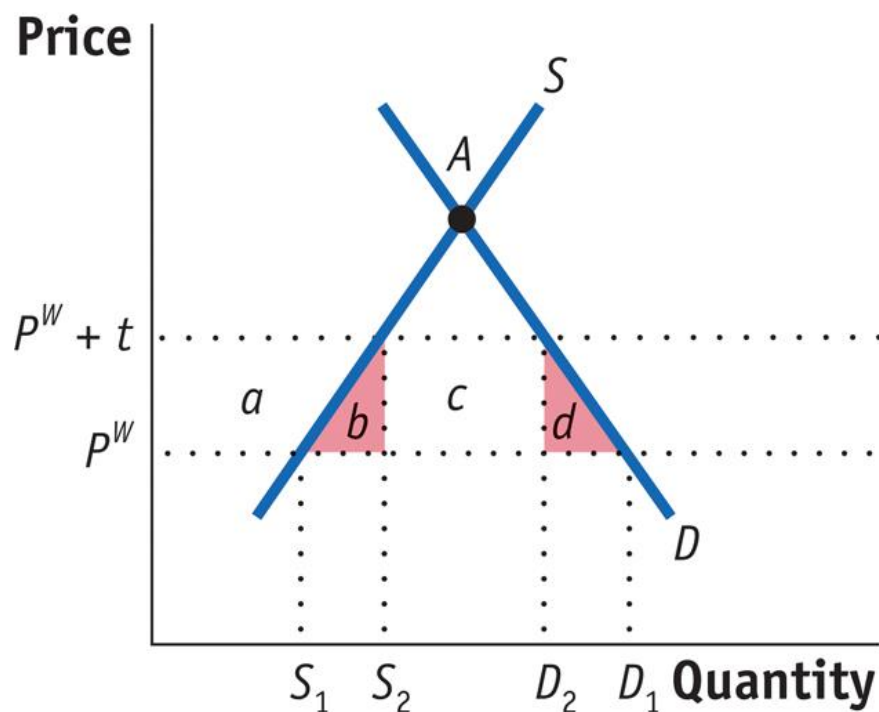


2- Tariffs in a small economy

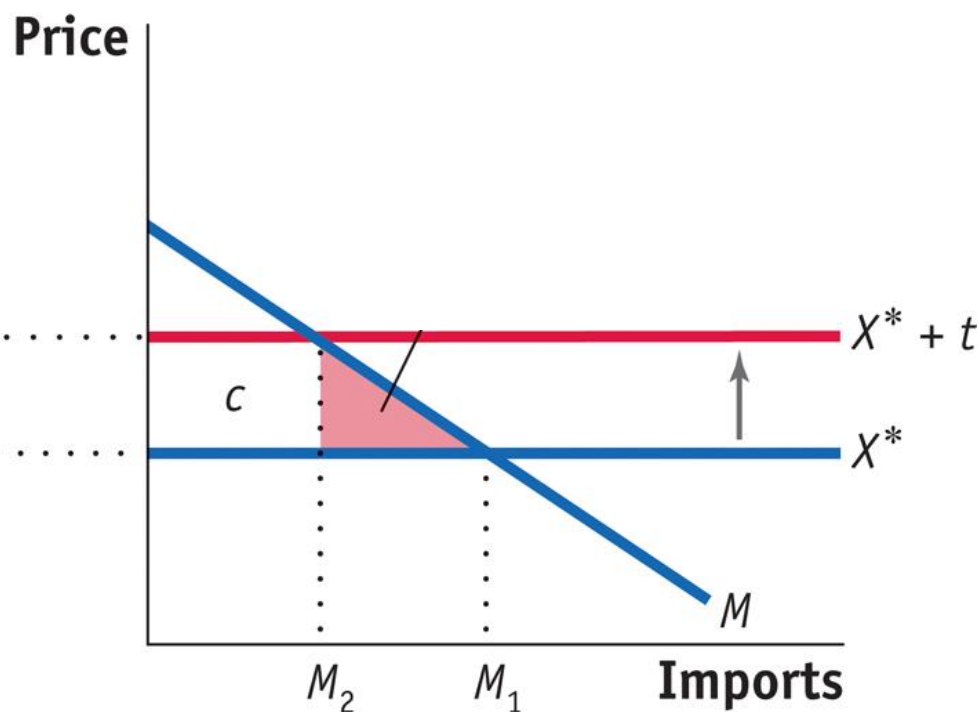
Effect of tariffs?

Decrease in consumer surplus = $(a+b+c+d)$

(a) Home Market



(b) Import Market

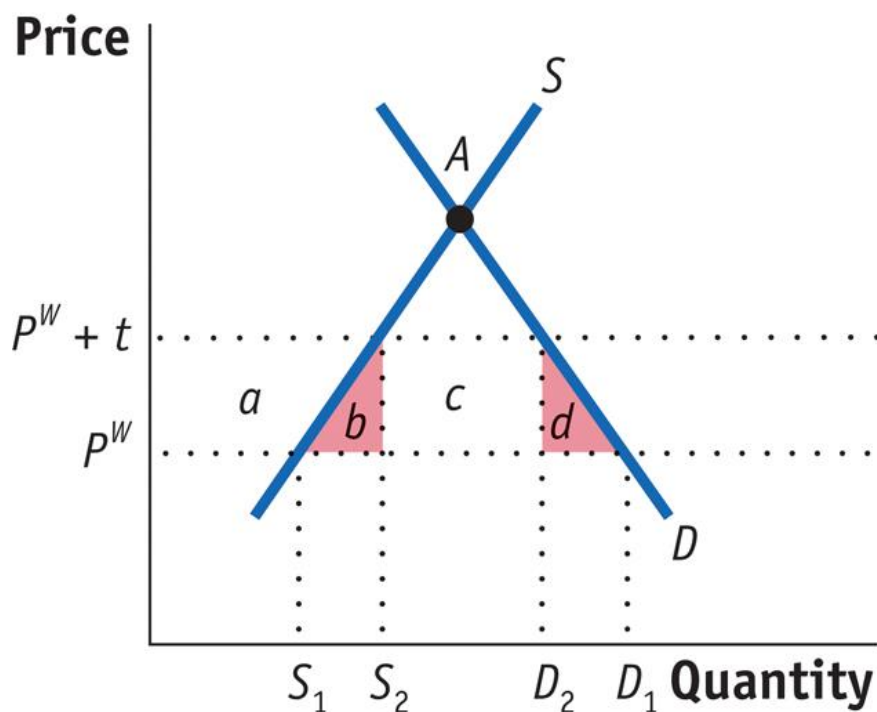


2- Tariffs in a small economy

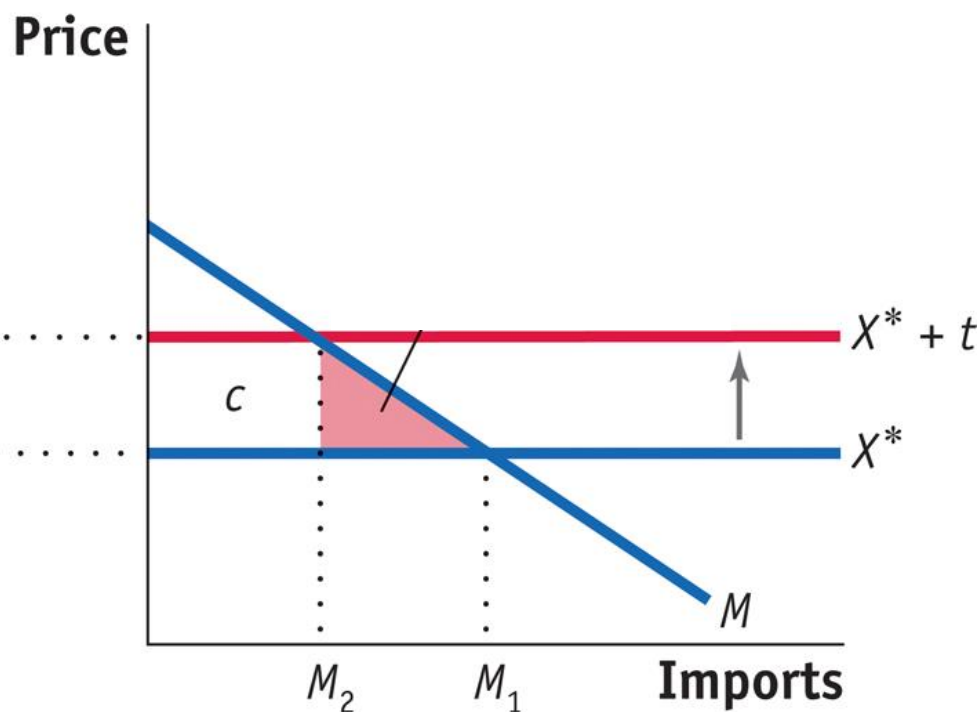
Effect of tariffs?

Increase in producer surplus = ?

(a) Home Market



(b) Import Market

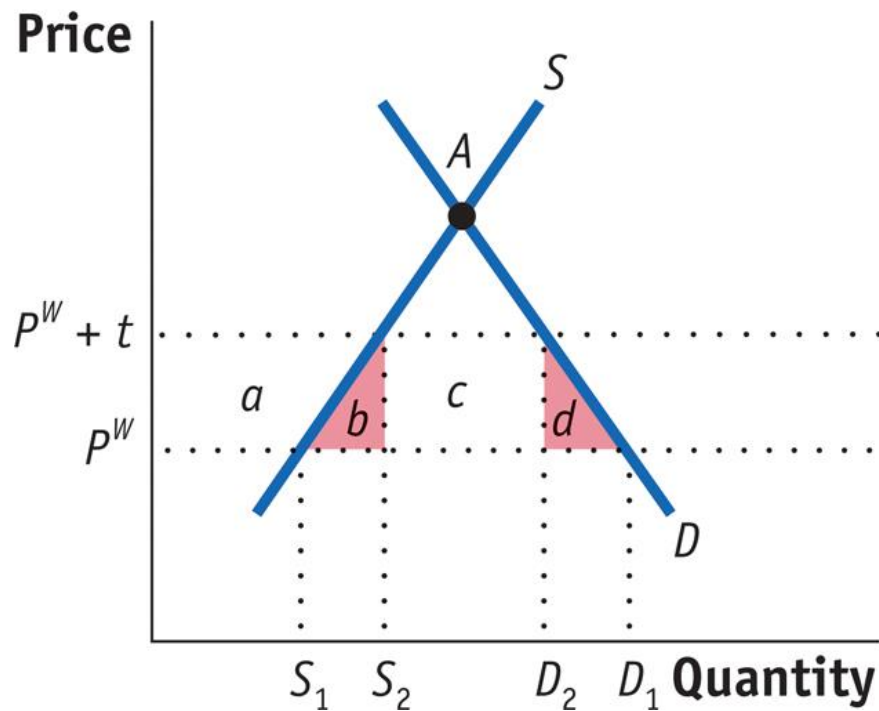


2- Tariffs in a small economy

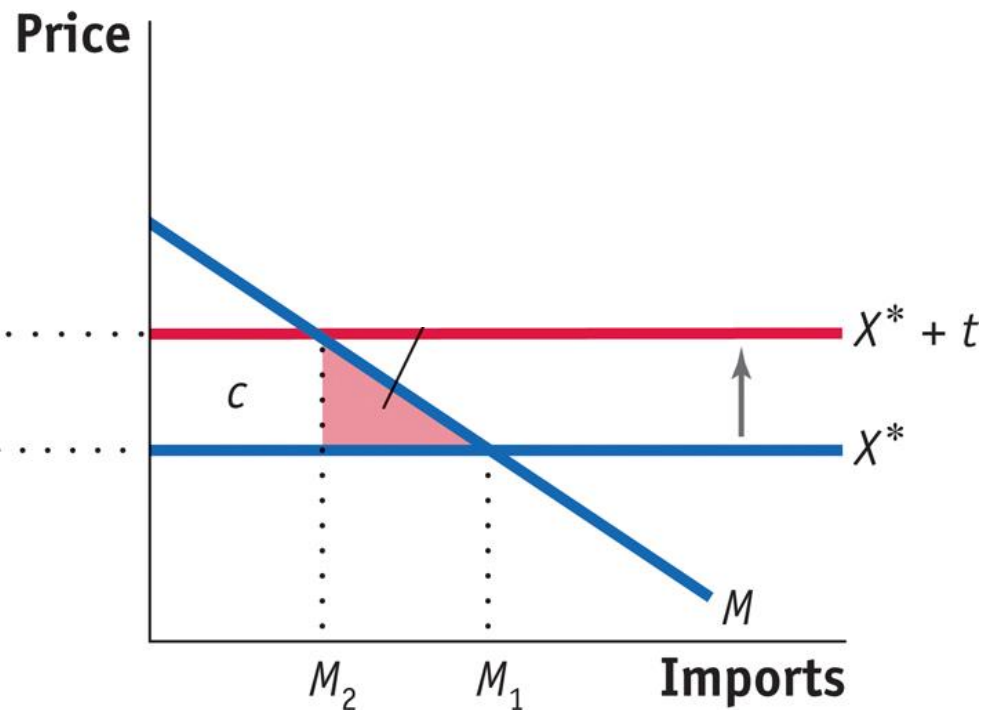
Effect of tariffs?

Increase in producer surplus = **a**

(a) Home Market



(b) Import Market

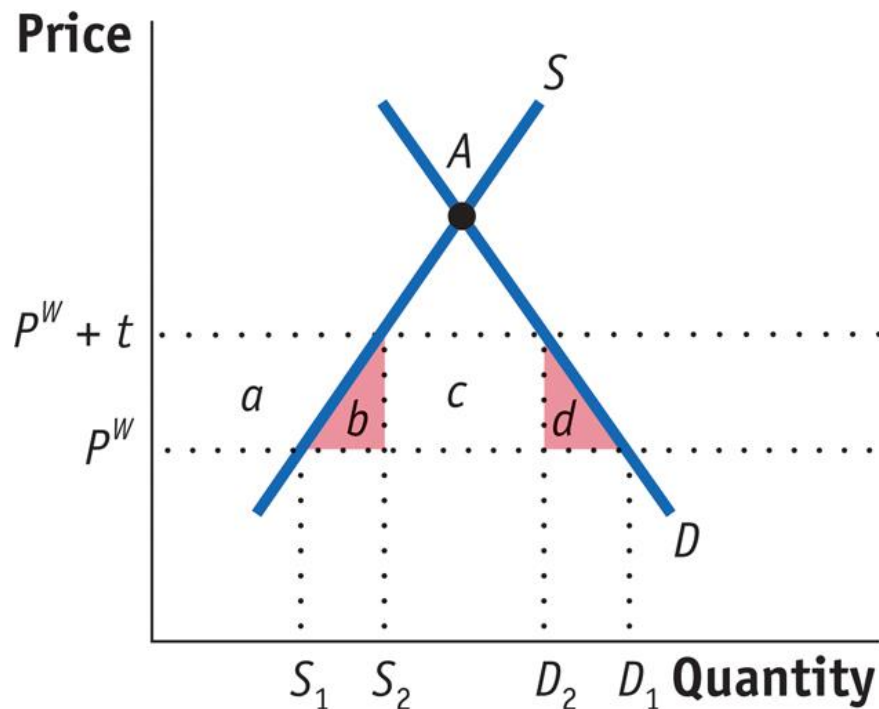


2- Tariffs in a small economy

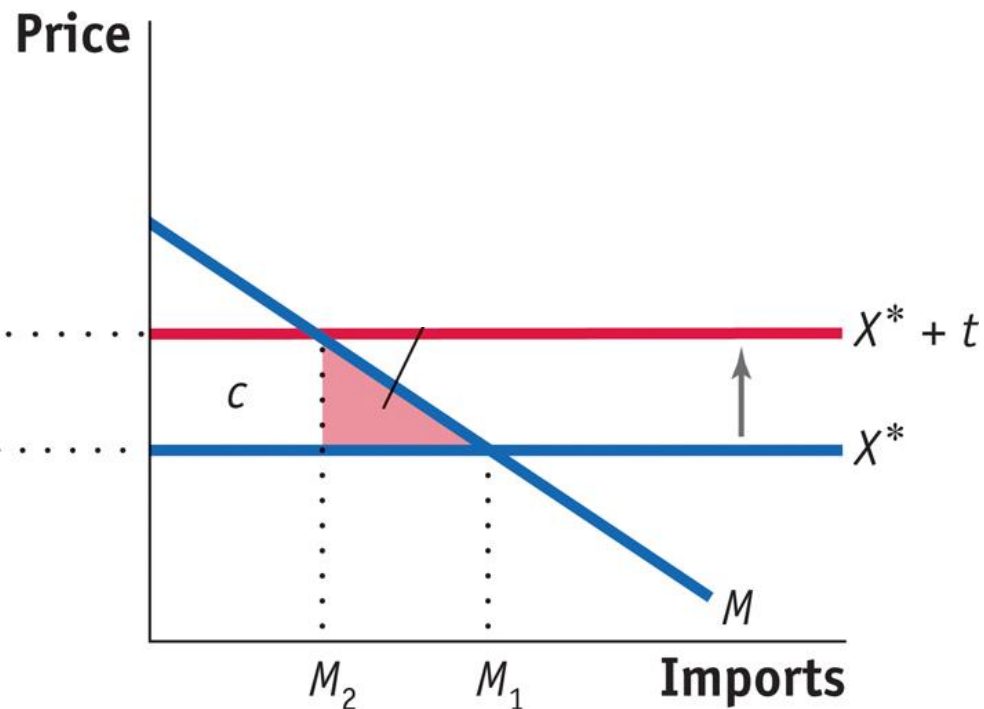
Effect of tariffs?

Additional tariff revenues = ?

(a) Home Market



(b) Import Market

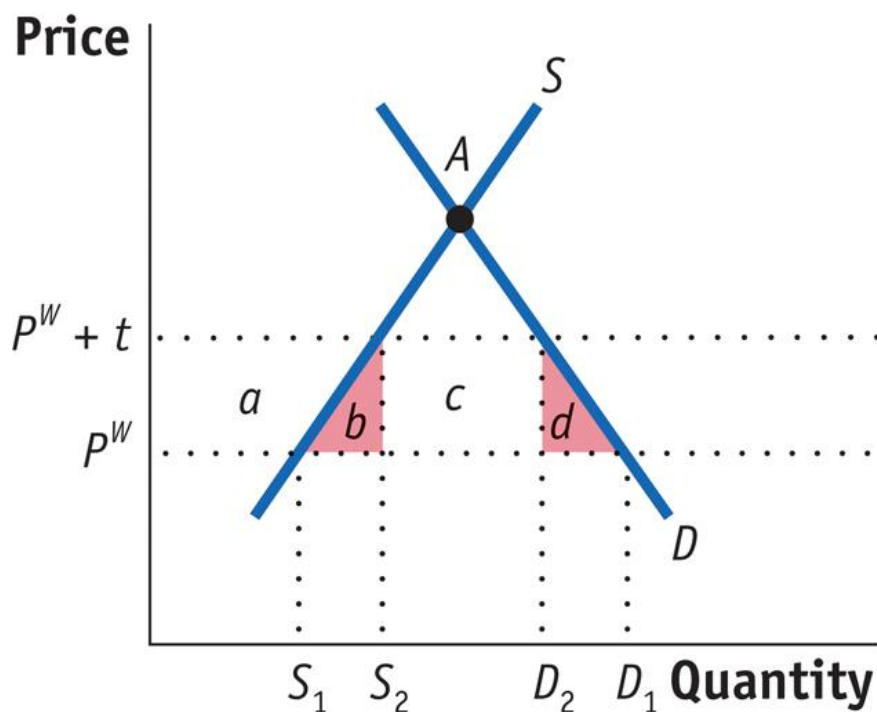


2- Tariffs in a small economy

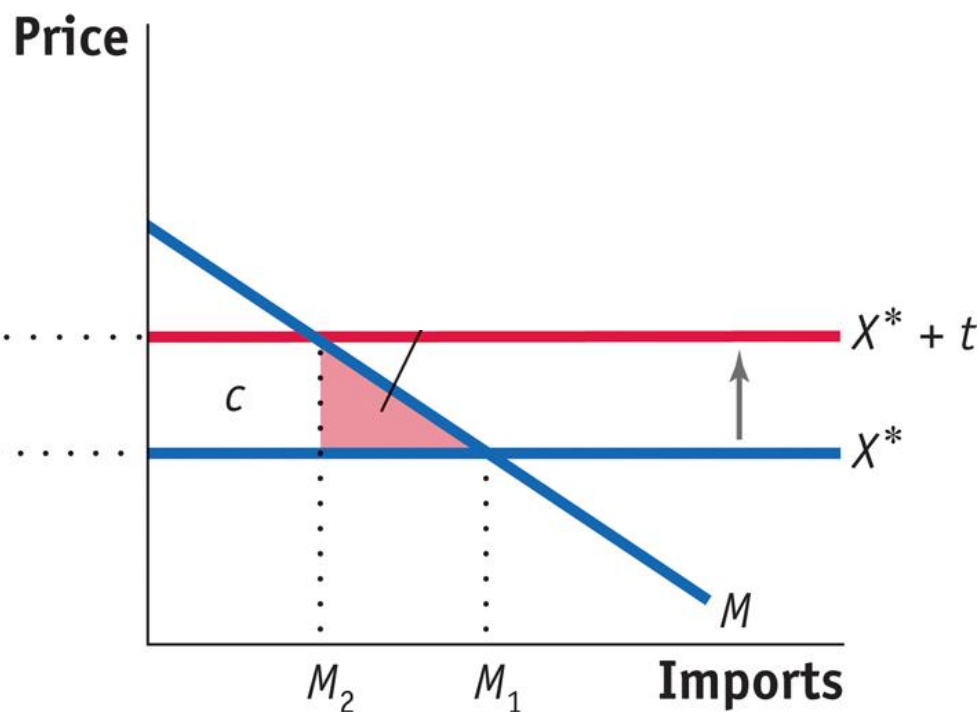
Effect of tariffs?

Additional **tariff revenues** = **c**

(a) Home Market



(b) Import Market



2- Tariffs in a small economy

Effect of tariffs?

Account for:

- change in consumer surplus: $- (a+b+c+d)$
 - change in producer surplus: $+ a$
 - Tariff revenues: $+ c$
-
- TOTAL: “deadweight loss” $- (b+d)$

2- Tariffs in a small economy

Effect of tariffs?

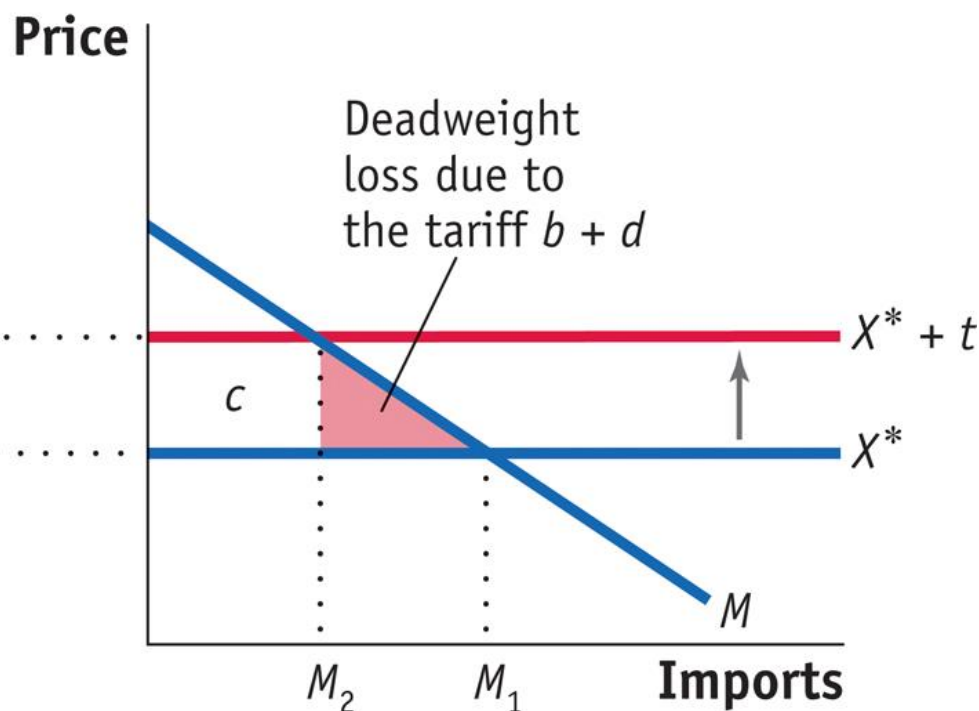
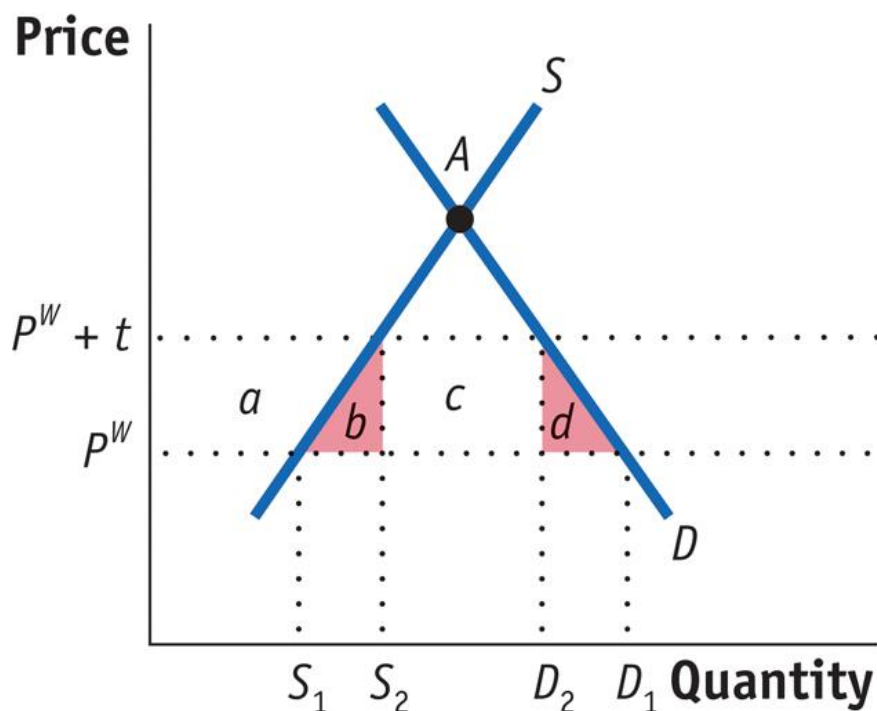
NET effect = - (b+d)

$$= \frac{1}{2} [(S_2 - S_1) + (D_1 - D_2)] \cdot t$$

$$= \frac{1}{2} (M_1 - M_2) \cdot t$$

(a) Home Market

(b) Import Market



2- Tariffs in a small economy

Effect of tariffs?

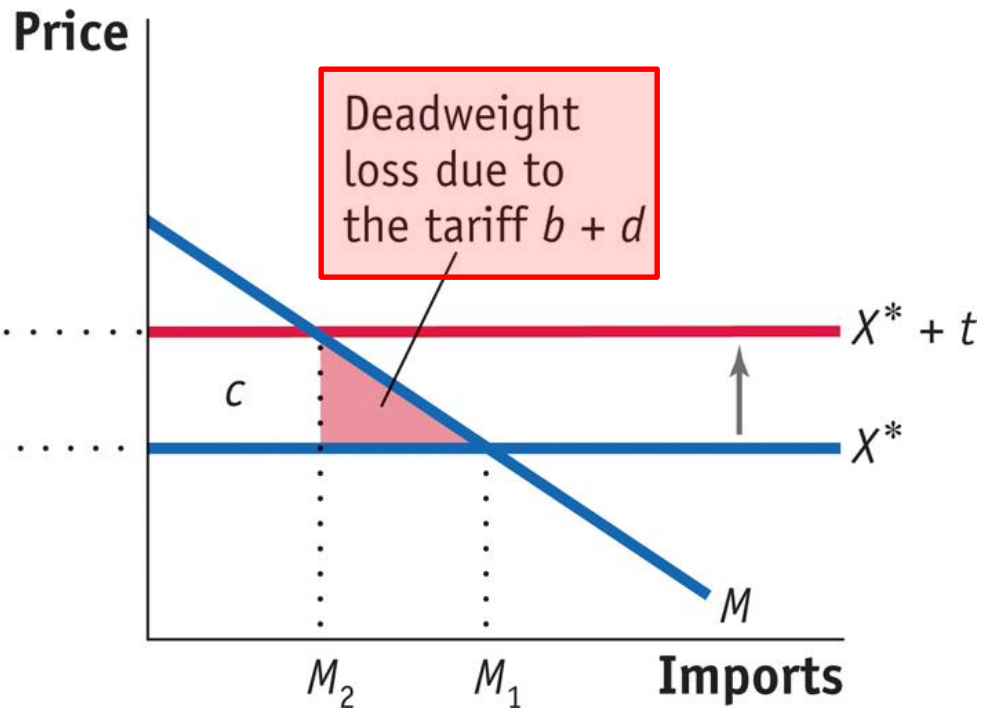
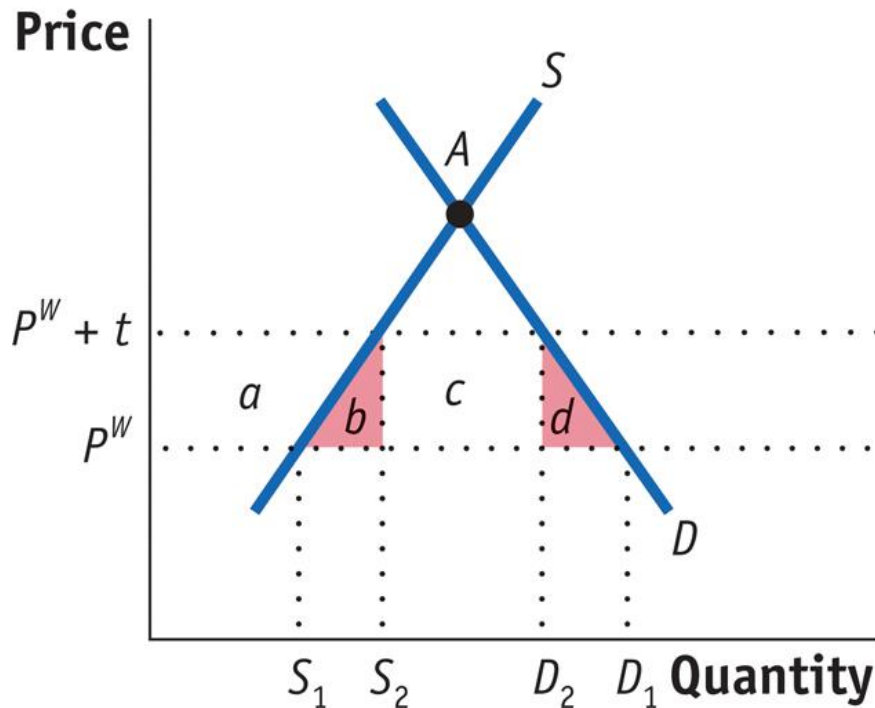
NET effect = - (b+d)

$$= \frac{1}{2} (M_1 - M_2) \times t$$

= consumer surplus using import curve!

(a) Home Market

(b) Import Market

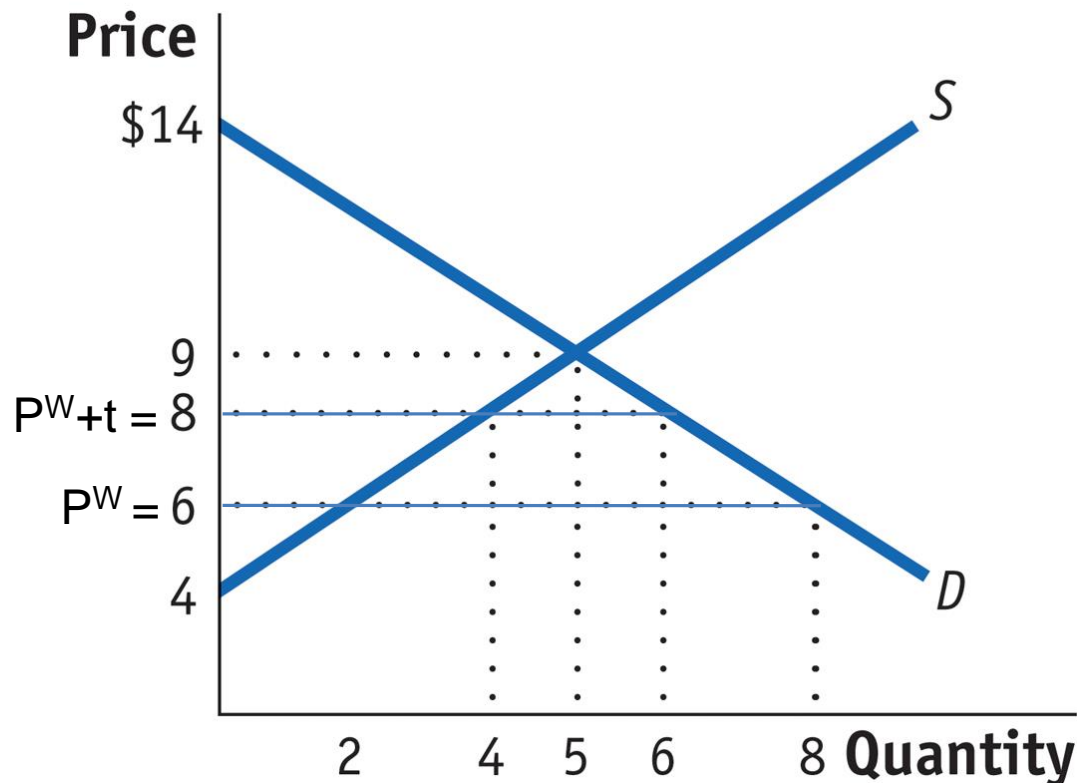


2- Tariffs in a small economy

Numerical example:

Compared to free trade ($P^W = \$6$), with tariff $t = \$2$:

Net welfare loss from tariff? (new price: \$8)



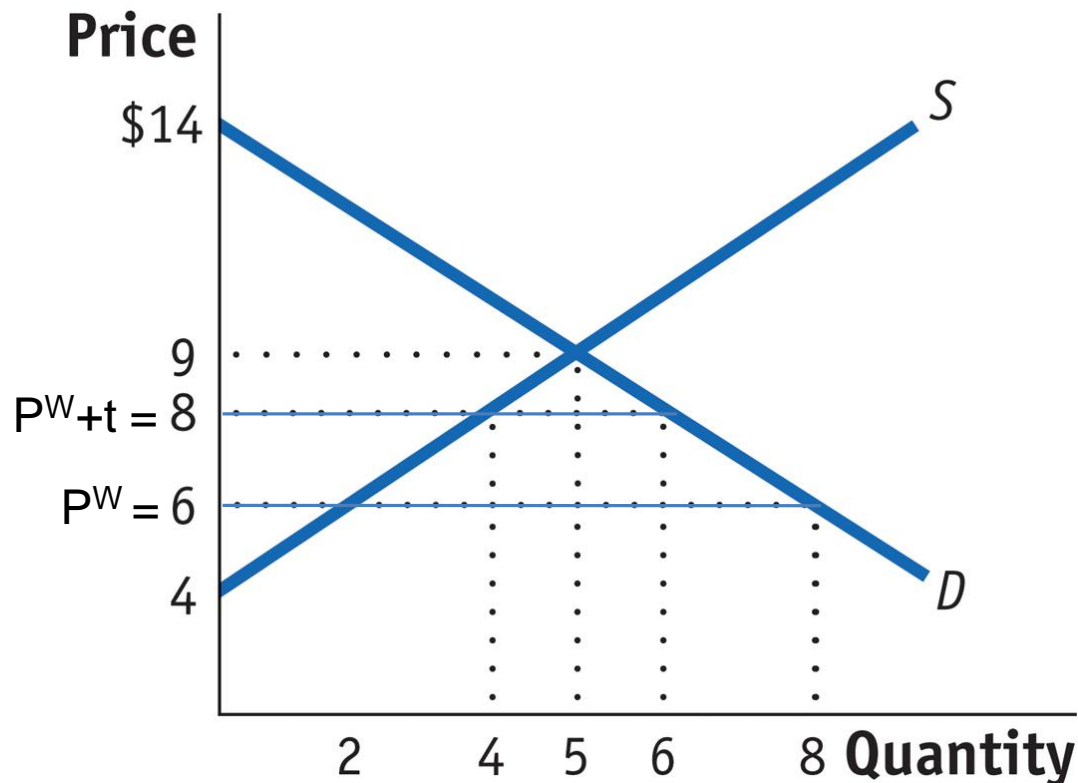
- a) \$2
- b) \$4
- c) \$8
- d) \$16
- e) \$32
- f) \$64

2- Tariffs in a small economy

Numerical example:

Compared to free trade ($P^W = \$6$), with tariff $t = \$2$:

Net welfare loss from tariff = $\frac{1}{2} \times \$2 \times 4 = \4 loss



2- Tariffs in a small economy

Effect of tariffs?

Conclusion for a small open economy:

- Tariffs → net welfare loss

Next lectures:

- Tariffs in a large economy
- Why small economies would still have tariffs?
- How to constraint large economies to reduce tariffs?