

International Economics: Lecture 11

Basic Tariff Analysis

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Our purpose:

Identify the effects of tariffs on:

- *national welfare*, and specifically on
 - domestic producers,
 - domestic consumers,
 - government revenues.

Tariffs are taxes on imported (sometimes also exported) goods.

- *ad valorem tariff* - a tariff charged as percentage of the customs value,
- *specific tariff* - a tariff charged as fixed amount per quantity,
- *compound tariff*.

Armenian import tariffs

	2017	2020	2021	2022
Frozen meat	10	15	25	50%, no less 1 euro per 1kg
Cars	10	10	10	23%, 0.83-1.2 euro per 1 cubic cm engine capacity
Sunflower oil	10	12	13	15%
Butter	10	12	13	15%

Starting from 2022 Armenian tariff rates will be fully harmonized with Eurasian Economic Community rates.

Armenia doesn't impose tariffs on export.

Our assumptions:

- small country (price taker, i.e. the country has no impact on world price),
- a dollar of consumer, producer and government has equal welfare weight,
- perfect competition,
- homogeneous good,
- full employment.

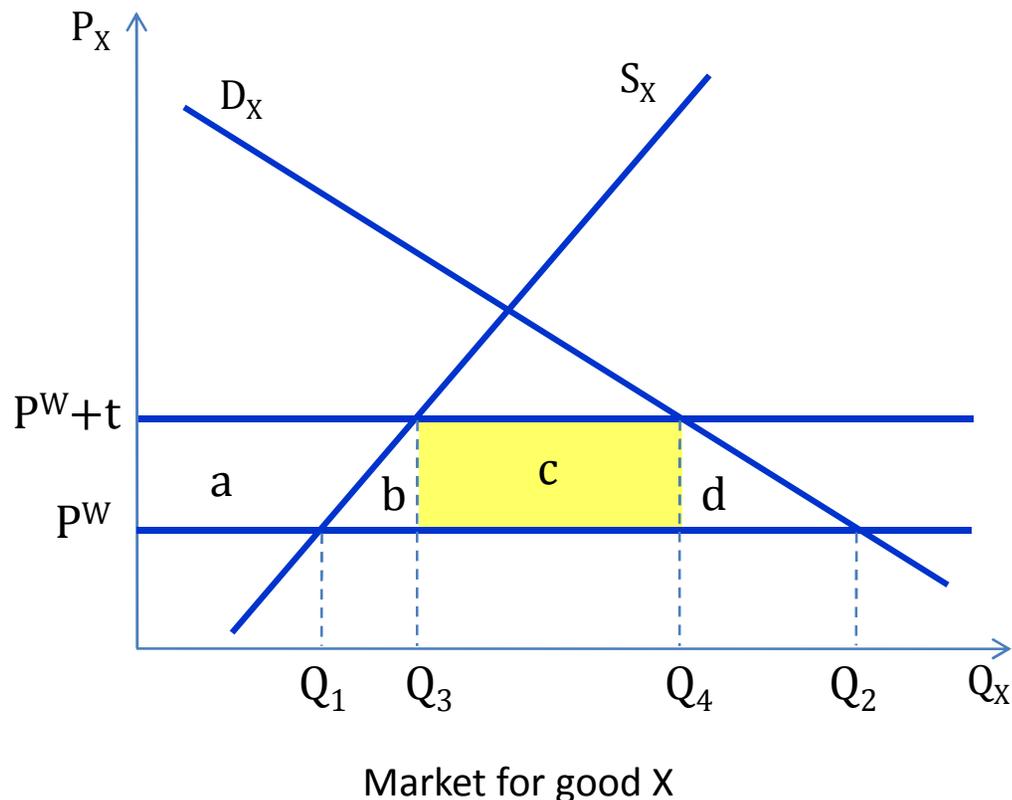
Governments' stated goals of trade policy:

- increase employment,
- increase production,
- increase government revenue,

- *IN REALITY* by imposing trade barriers all the governments in the world mainly aim to favor (protect) politically influential interest groups.

- *The government is certainly able to increase the production & employment in protected industries, but what are the associated costs? Will the country really gain from trade barriers, or actually lose.*

Import tariff in a SMALL country partial equilibrium analysis



Consumer surplus	$-(a+b+c+d)$
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Producer surplus	$+a$
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Government revenue	$+c$
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National welfare	$-(b+d)$
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Import quantity

- under free trade: $Q_2 - Q_1$

- after tariff: $Q_4 - Q_3$

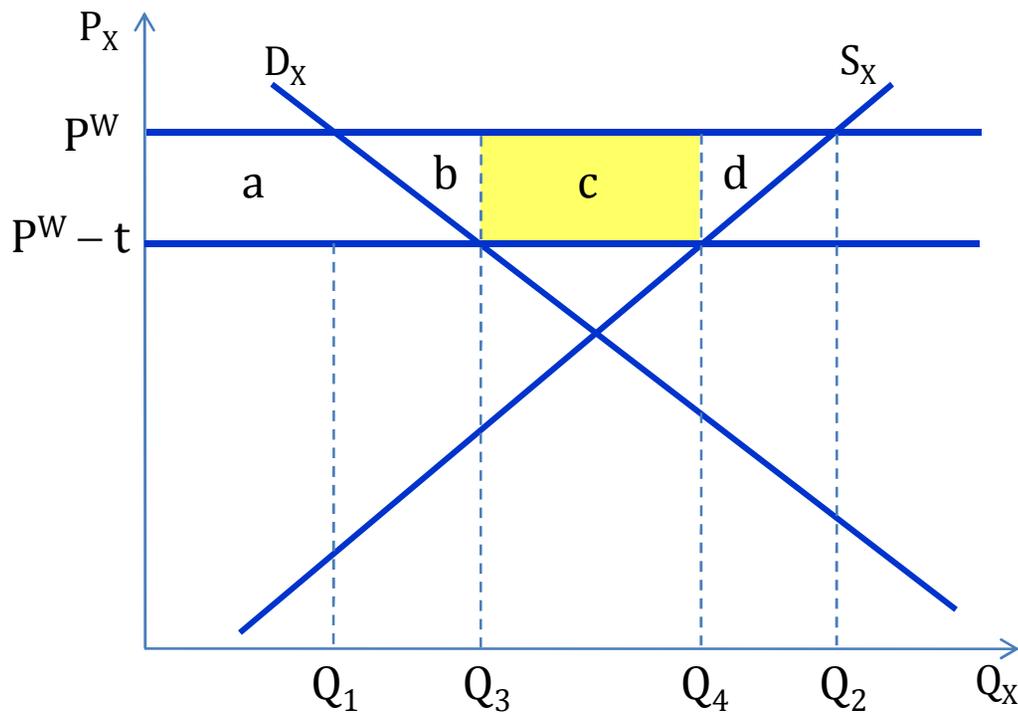
After tariff price, if the tariff

- is specific: $P^W + t$

- is ad valorem: $P^W(1 + t)$

As the country is small, domestic price increases by the full amount of the tariff.

Export tariff in a SMALL country partial equilibrium analysis



Market for good X

Consumer surplus	+a
Producer surplus	-(a+b+c+d)
Government revenue	+c
National welfare	-(b+d)

Export quantity

- under free trade: $Q_2 - Q_1$

- after tariff: $Q_4 - Q_3$

After tariff price, if the tariff

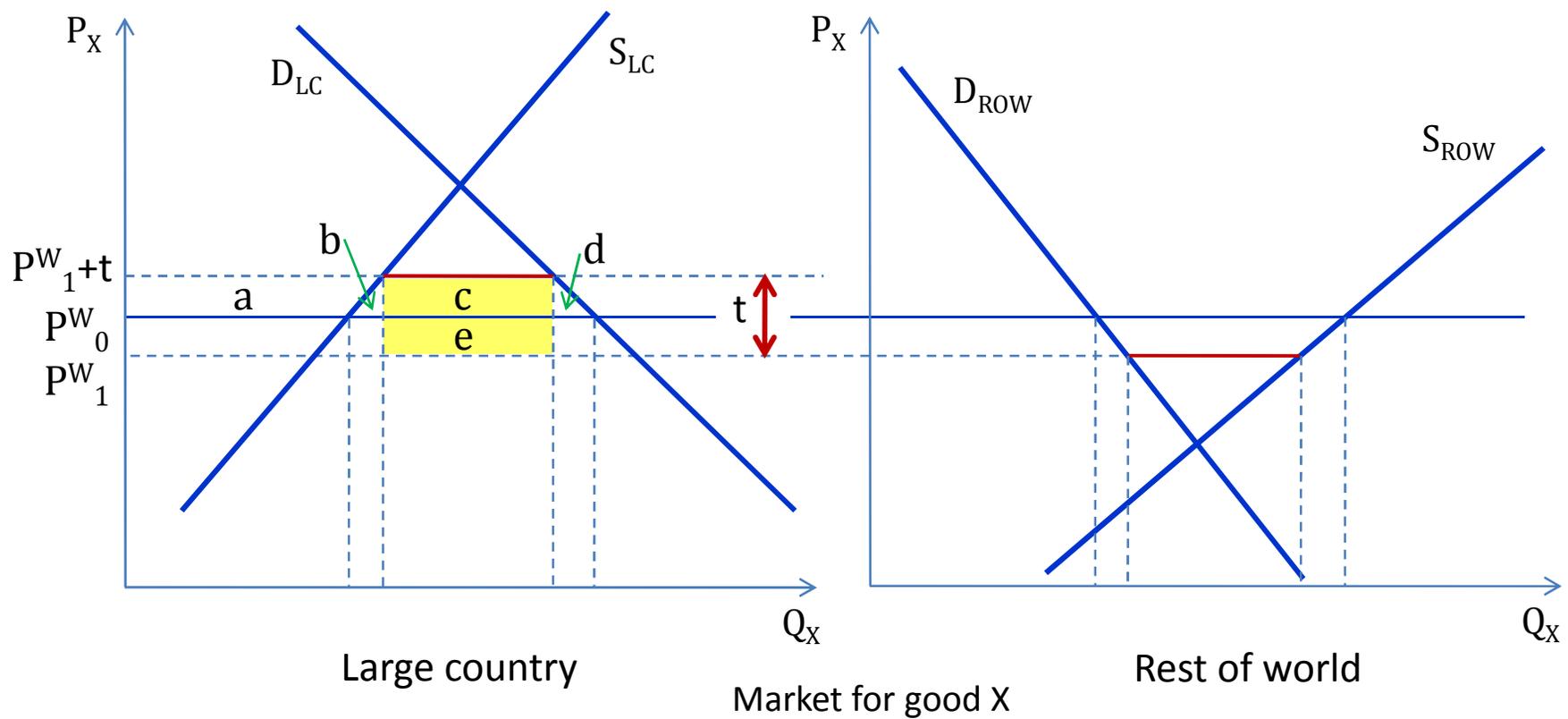
- is specific: $P^W - t$

- is ad valorem: $P^W(1 - t)$

As the country is small, domestic price decreases by the full amount of the tariff.

*Import tariff in a LARGE country
partial equilibrium analysis*

Consumer surplus	$-(a+b+c+d)$
Producer surplus	$+a$
Government revenue	$+(c+e)$
National welfare	$e-(b+d)$



Optimal tariff

Tariff distorts both consumption and production, therefore ...

for a small country optimal tariff rate is zero.

But for a large country optimal tariff rate may be positive. Specifically, if $e-(b+d) > 0$, then the optimal tariff should maximize $e-(b+d)$, provided there is no tariff retaliation.

A country which has monopsony power – is a large importer of a commodity from many competing suppliers – by increasing tariff may force exporters to lower their pre-tariff prices and therefore improve its terms of trade.

Tariff escalation & Effective rate of protection

Tariff escalation - higher import tariffs on finished goods, than on raw materials.

Effective rate of protection (ERP) - the effect of a tariff structure on an industry's or firm's value added, considering tariffs both on imported inputs and on output.

$$ERP = (V_1 - V_0) / V_0$$

V_0 – domestic value added under free trade
 V_1 – domestic value added with tariffs on final output and imported inputs

$$ERP = \frac{\{P(1+t_f) - Pa(1+t_i)\} - P(1-a)}{P(1-a)} = \frac{t_f - at_i}{(1-a)} \quad \begin{array}{l} \text{if } t_f > t_i \\ \text{then } ERP > t_f \end{array}$$

t_f - tariff rate on final output, t_i – tariff rate on imported inputs,

P - final output price, a – the ratio of the cost of imported input to the price of the final output prior to tariffs.

Effective rate of protection: **Smart-phones**

Imported components	\$200	Tariff on final imports	10%
Assembly (domestic value added)	\$100	Tariff on components imports	0%
Free trade price	\$300	Domestic price after tariff	\$330

$$t_f = 10\%, \quad t_i = 0\%, \quad a = 2/3, \quad ERP = (0.1 - 2/3(0)) / (1 - 2/3) = 30\%$$

$V_0 = \$100$, with 10% tariff on final output $V_1 = \$130$ ($330 - 200$),
so ERP = 30%

\$30 tariff on each smart-phone represents a 10% nominal tariff rate,
but a 30% effective tariff rate.

Consumers are only concerned, that the price increases by 10%, but
producers view this as 30% rise on their domestic value added.

$$\frac{t_f - at_i}{(1 - a)} \quad \text{if } t_f > t_i \text{ then } ERP > t_f$$

Effective rate of protection: **Smart-phones**

Imported components	\$200	Tariff on final imports	10%
Assembly (domestic value added)	\$100	Tariff on components imports	5%
Free trade price	\$300	Domestic price after tariff	\$330

$$t_f = 10\%, \quad t_i = 5\%, \quad a = 2/3, \quad ERP = (0.1 - 2/3(0.05)) / (1 - 2/3) = 20\%$$

$V_0 = \$100$, with 10% tariff on final output and 5% tariff on imported inputs $V_1 = \$120$ ($330 - 210$),
so ERP = 20%

$$\frac{t_f - at_i}{(1 - a)} \quad \text{if } t_f > t_i \text{ then } ERP > t_f$$

Effective rate of protection: **Smart-phones**

Imported components	\$200	Tariff on final imports	10%
Assembly (domestic value added)	\$100	Tariff on components imports	10%
Free trade price	\$300	Domestic price after tariff	\$330

$$t_f = 10\%, \quad t_i = 10\%, \quad a = 2/3, \quad ERP = (0.1 - 2/3(0.1)) / (1 - 2/3) = 10\%$$

$V_0 = \$100$, with 10% tariff on final output and 10% tariff on imported inputs $V_1 = \$110$ ($330 - 220$),
so ERP = 10%

$$\frac{t_f - at_i}{(1 - a)} \quad \text{if } t_f > t_i \text{ then } ERP > t_f$$

Effective rate of protection: **Smart-phones**

Imported components	\$200	Tariff on final imports	10%
Assembly (domestic value added)	\$100	Tariff on components imports	20%
Free trade price	\$300	Domestic price after tariff	\$330

$$t_f = 10\%, \quad t_i = 20\%, \quad a = 2/3, \quad ERP = (0.1 - 2/3(0.2)) / (1 - 2/3) = -10\%$$

$V_0 = \$100$, with 10% tariff on final output and 20% tariff on imported inputs $V_1 = \$90$ ($330 - 240$),
so $ERP = -10\%$

$$\frac{t_f - at_i}{(1 - a)} \quad \text{if } t_f > t_i \text{ then } ERP > t_f$$

Thank you and good luck,

but remember

If a man neglects education,
he walks lame to the end of
his life.

Plato, "*Timaeus*"