Lecture 10 Trade Policy Analysis: Tariffs

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Reference: Feenstra and Taylor, 2017, International Trade
CH8.3-4 Import Tariffs Under Perfect Competition
CH9.1-4 Import Tariffs Under Imperfect Competition
CH 10.5 Export Tariffs in a Small and Large Country

I. Basic Concepts and Assumptions
1. Tariff type
    1) Ad valorem tariff: levied on a good as a percentage of that good's price.
    2) Specific tariff: a fixed fee levied on one unit of an imported good.
    3) Import tariff (protection and revenue) v.s export tariff (strategy and revenue)
2. Country type
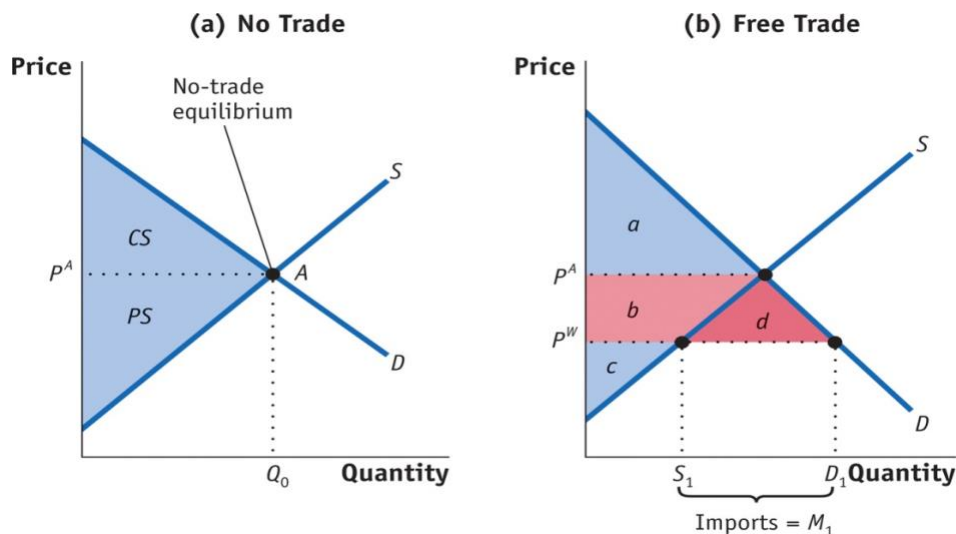   1) Small country takes world price as given (albeit its demand curve can be downward-sloping).
    2) Large country could affect world prices via its trade policy on its imports.
   3) Small country's foreign supply curve doesn't have to be horizontal.
3. Competition structure
    1) Home monopoly: a single firm selling a homogenous good. It faces competition from foreign countries.
    2) Foreign monopoly: no competition from the Home country. It faces a downward-sloping Home import demand curve.

II. Welfare analysis with and without trade
    1. In autarky, welfare is maximized at point A (Q_A, P_A). The total welfare is the sum of CS and PS.
    2. With trade, home country imports goods at a lower price P*, CS increases more than the decline in PS.

III. Import Tariff for a Small Country (P^* is given)

(a) Home Market

(b) Import Market

(a) Home Market

(b) Import Market
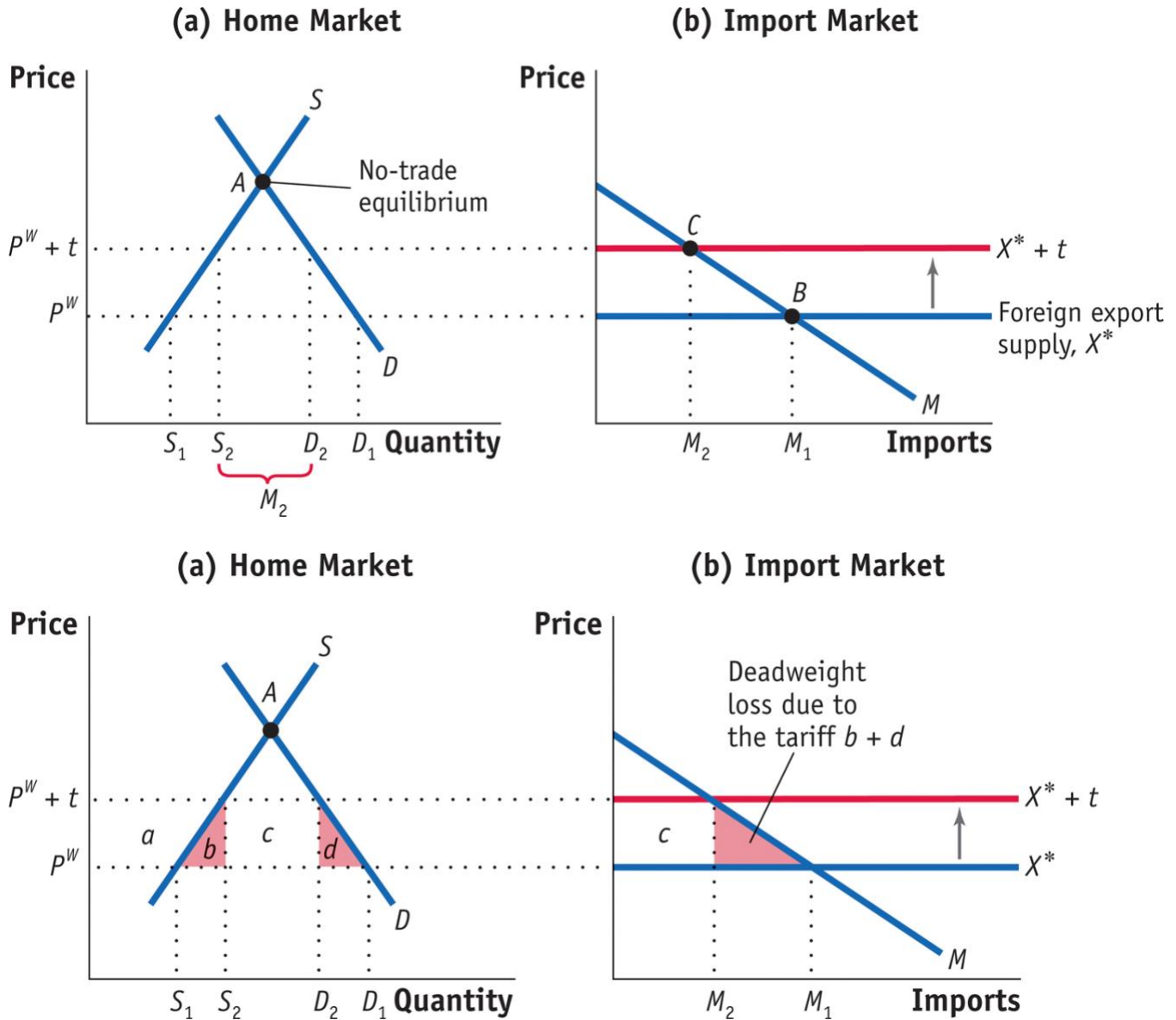
1. The home country is a small country and it takes world price as given. Its import demand curve is horizontal.

2. Levying tariff will raise import price by t, causing a decrease in quantity imported from M1 to M2.

3. Consumers lose from higher tariff: $-(a+b+c+d)$

4. Producers gain from higher tariff: $+a$

5. Government gains from higher tariff: $+c$

6. Net welfare loss: $-(b+d)$

7. Home deadweight loss=$1/2*\text{Tariff}*(M_1-M_2)$

8. Foreign producers incur no loss because home country is a small country and its import is trivial.

Note: Import demand M=D-S and the area of b+d is the deadweight loss due to the tariff.

9. If a small country suffers a loss when it imposes a tariff, why do so many still apply import tariffs?
   1) One answer is that a developing country does not have any other source of government revenue. Import tariffs are "easy to collect."
   2) A second reason is politics. The benefits to producers (and their workers) are typically more concentrated on specific firms and states than the costs to consumers, which are spread nationwide.
10. Application: U.S. safeguard tariffs
    1) The U.S. Trade Act of 1974, as amended, describes conditions under which tariffs can be applied in the United States, and it mirrors the provisions of the GATT and WTO.
    2) Section 201 allows the United States to impose safeguard tariffs if imports are a "substantial cause of serious injury, or the threat thereof, to the domestic industry," where the term "substantial cause" means a cause which is *important and not less than any other cause*.
    3) Section 421 allows the United States to impose safeguard tariffs on China, upon its entry into WTO in 2001, if imports from China "cause or threaten to cause market disruption to the domestic producers." Because the U.S. was worried about exceptional surges in imports from China, Section 402 was added to U.S. trade law for 12 years, and expired on December 11, 2013.
    4) U.S. Tariffs on Steel and Tires. U.S. ITC Recommended and Actual Tariffs for Steel Shown here are the tariffs recommended by the U.S. International Trade Commission for steel imports, and the actual tariffs that were applied in the first year.

Product Category	U.S. ITC Recommendation (First Year, %)	Actual U.S. Tariff (First Year, %)
Carbon and Alloy Flat Products		
Slab	20	30
Flat products	20	30
Tin mill products	U*	30
Carbon and Alloy Long Products		
Hot-rolled bar	20	30
Cold-finished bar	20	30
Rebar	10	15
Carbon and Alloy Tubular Products		
Tubular products	?**	15
Alloy fittings and flanges	13	13
Stainless and Tool Steel Products		
Stainless steel bar	15	15
Stainless steel rod	?**	15
Stainless steel wire	U*	8

    5) Response of the European Countries: The countries in the European Union (EU) took action by bringing the case to the WTO. The WTO ruling entitled the European Union and other countries to retaliate against the United States by imposing tariffs of their own against U.S. exports. The use of tariffs by an importer can easily lead to a response by exporters and a tariff war.

IV. Import Tariff for a Large Country (affect world prices)

(a) Home Market　　　　　　**(b) World Market**
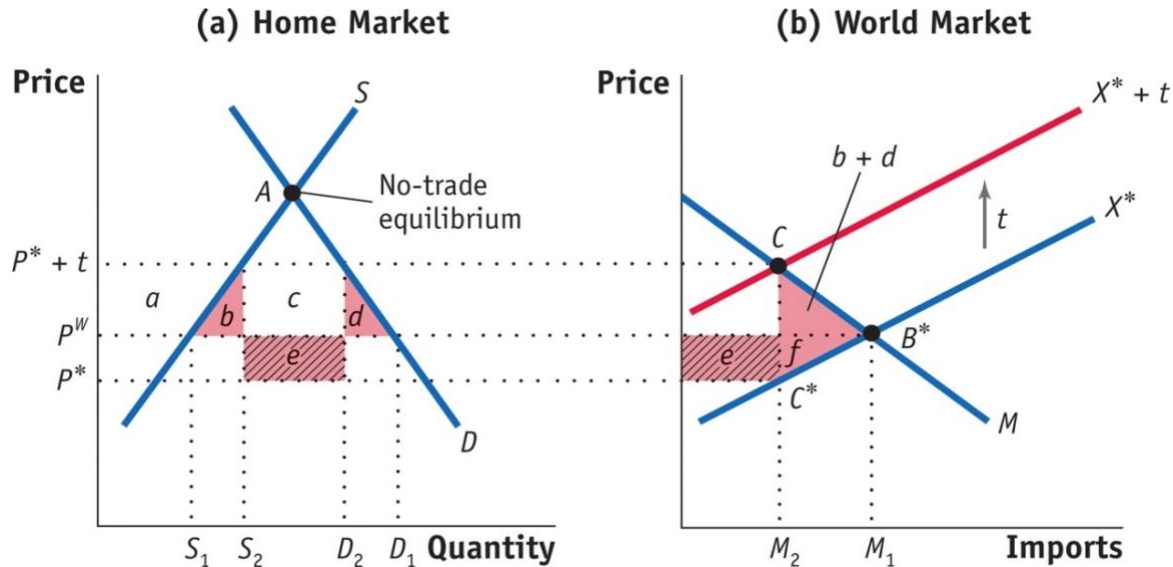
1. Assume home country import tariff raises foreign producers' cost by t; foreign exporters pass this additional cost t to home consumers. Foreign export supply curve shifts up by t from X^* to X^*+t
2. World price falls to P^* from P^w; import price rises from P^w to P^*+t; import quantity drops to M2.
3. Consumers: $-(a+b+c+d)$
4. Producers: $+a$
5. Governments: $c+e$
6. Home net welfare: **e-(b+d)**
7. Foreign producers: $-(e+f)$.
8. World net welfare: $-(b+d+f)$

V. Optimal Tariff for a Large Country
1. In theory, a small country can never benefit from import tariff in terms of net welfare measure. But a large country may be able to gain from levying import tariff. Why?
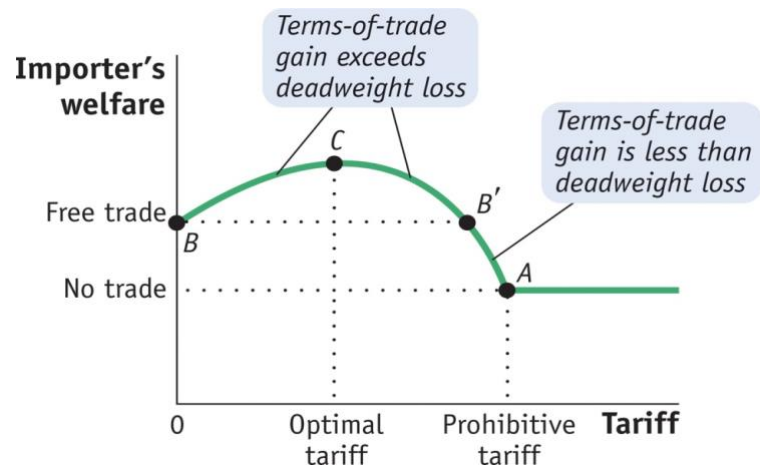
2. For a large importing country, a tariff initially increases the importer＇s welfare because the terms-of-trade gain (import price falling, measured by e) exceeds the deadweight loss (b+d). The importer＇s welfare rises from point B. Welfare continues to rise until the tariff is at its optimal level (point C). After that, welfare falls. If the tariff is too large (greater than at B'), then welfare will fall below the free-trade level. For a prohibitive tariff, with no imports at all, the importer＇s welfare will be at the no-trade level, at point A.

3. Optimal tariff is defined as the tariff that leads to the maximum increase in welfare for the importing nation.

4. Optimal Tariff Formula=$1/E_X^*$, where E_X^* is the elasticity of Foreign export supply.

5. Application: U.S. optimal tariff on steel (calculation from the formula)

Product Category	Elasticity of Export Supply	Optimal Tariff (%)	Actual Tariff (%)
Alloy steel flat-rolled products	0.27	370	30
Iron and steel rails and railway track	0.80	125	0
Iron and steel bars, rods, angles, shapes	0.80	125	15–30
Ferrous waste and scrap	17	6	0
Iron and steel tubes, pipes, and fittings	90	1	13–15
Iron and nonalloy steel flat-rolled products	750	0	0

VI. Discriminatory tariff (targeted at one country but not others)

1. The tariff on tires imported from China, announced by President Obama on September 11, 2009, was filed under Section 421 of U.S. trade law. The tire tariff was applied to imports from a single country─China─under Section 421, whereas the steel tariff was applied against many countries under Section 201. For this reason, we will refer to the tariff on tires applied against China as a discriminatory tariff.
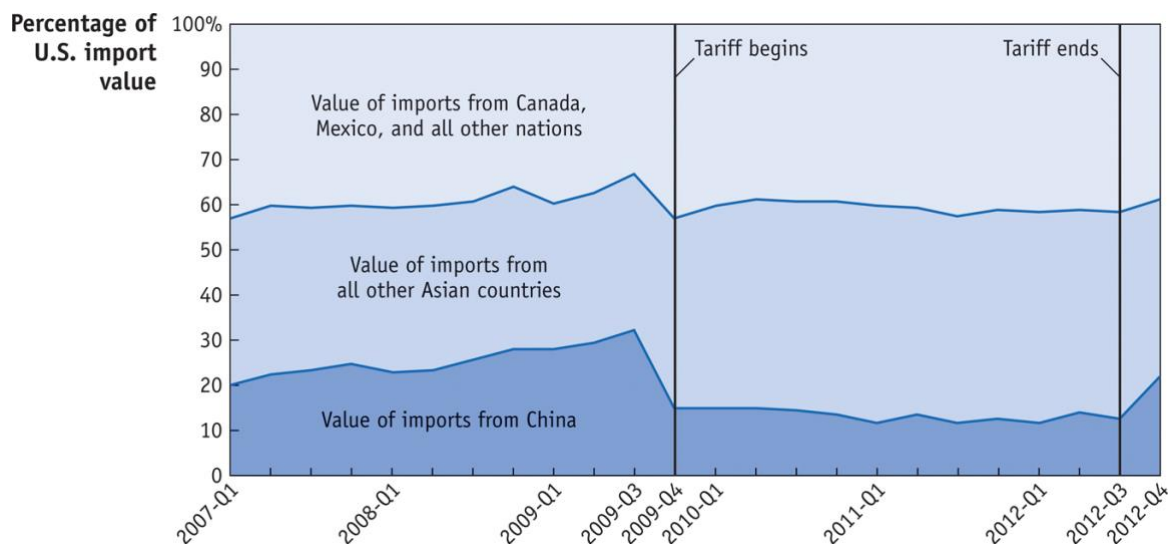
2. U.S. Imports of Tires The tariff applied to U.S. imports of tires began in the fourth quarter of 2009 and ended in the third quarter of 2012. The value of imports from China fell from about 33% of overall imports to 15% when the tariff began, and rose from about 12% of overall imports to 22% when the tariff ended. This decline in imports from

China was substantially made up by increased imports from other Asian countries and Mexico, which exported more to the United States.

3. Discriminatory tariff model (Targeted country F2 but non-targeted countries F1 will also raise price to p+t)
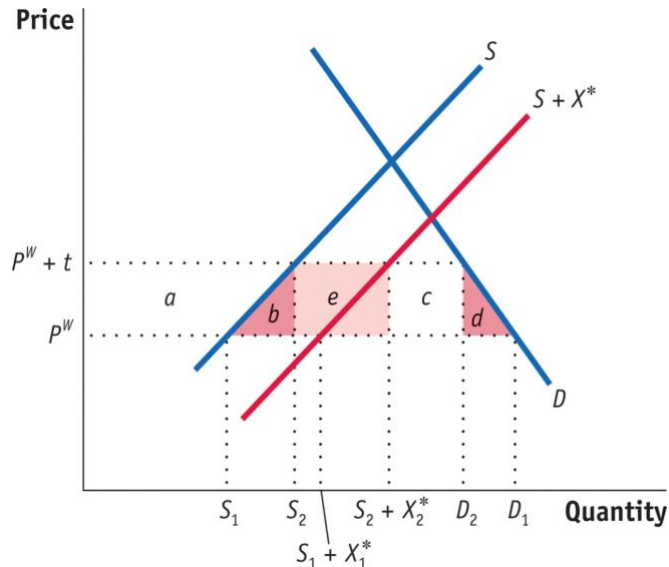
Home country is a small country.
At P^w, home imports D1-S1.
S is domestic supply curve.
X* is a foreign supply curve of country F1.
S+X* is combined quantity supplied of d & F1.
D-(S+X*) is quantity supplied of F2 (targeted).
With tariff, home imports D2-S2.
Consumers: -(a+b+e+c+d)
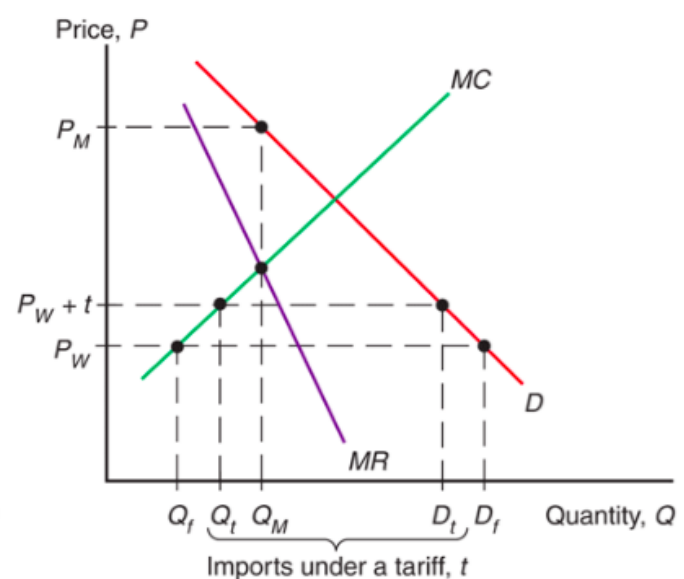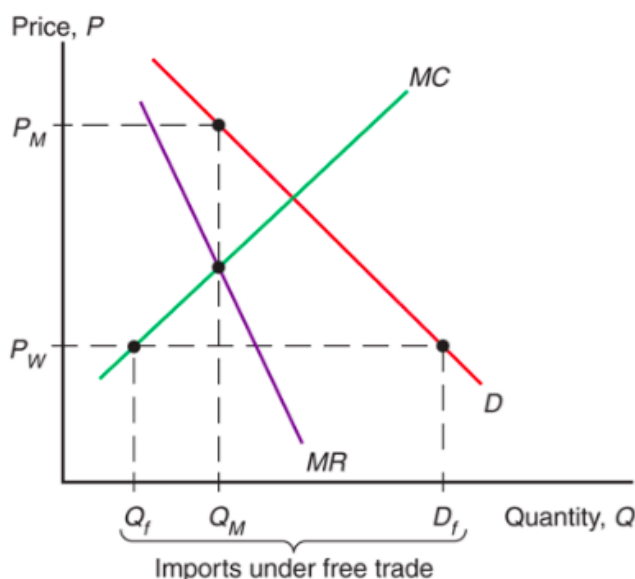Producers: +a
Governments: +(c) = t (D2-S2-X_2*)
Net welfare: -(b+e+d)
Home country impose tariff on only f2.
F1 gains e; F2 loses c due to discriminatory t.

VII. Import Tariffs in the Presence of Monopoly
1. Home country monopoly: International trade limits home country's monopoly power whereas trade policies that limit trade may increase domestic firms' monopoly power. (Small home country.)

1) A monopolist under free trade: not competitive in the world market with lower output compared with autarky. Monopoly decision in autarky (P_M, Q_M) and under free trade (P_W, Q_F).
2) A monopolist protected by a tariff: increases output and can charge higher price (P_W+t, Q_t)>(P_W, Q_F).

3) Home country welfare (small country case)
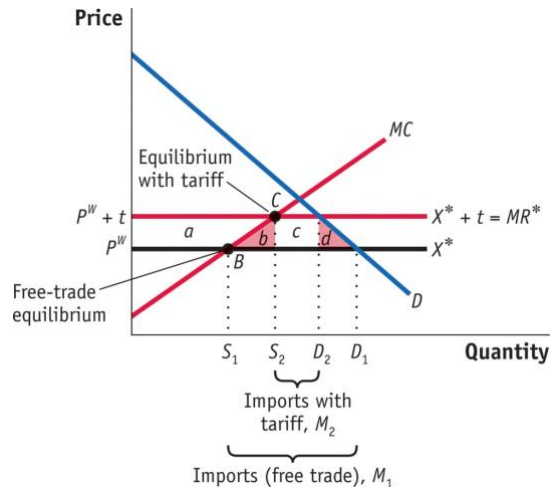
Home monopoly firms lose market power under free trade, becoming world price takers

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)

With a tariff, the Home monopolist still competes against a large number of importers, limiting its market power.

Do the effects of trade policies differ when markets are imperfectly competitive? This question received a good deal of attention from economists in the 1980s, in a body of research that became known as strategic trade policy.

2. Foreign country monopoly

Large country, by imposing import tariff on foreign companies, can lead to potential net welfare gain arising from TOT effect. To what extent do Foreign exporters behave in ways that benefit the Home country? 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**.

1) Foreign monopoly and dumping (MR=MR*=MC*, P*>P, Produce Q$_1$, export Q$_1$-Q$_2$)
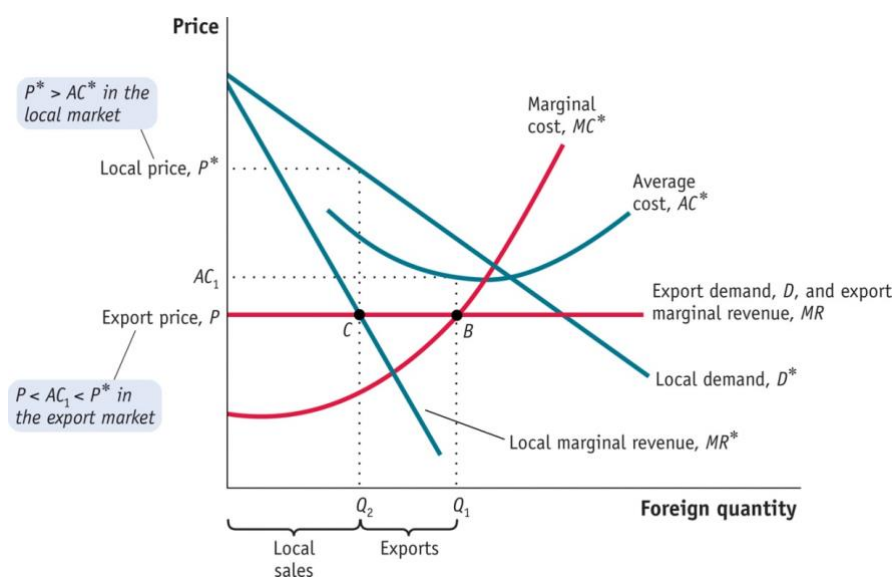
2) Antidumping duty in home country
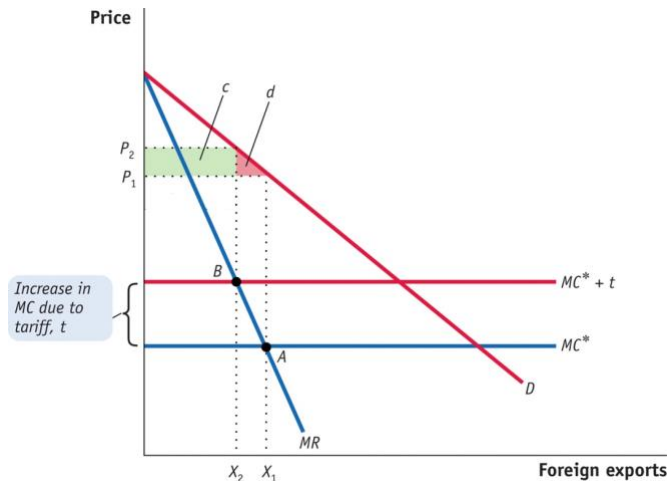
A foreign monopoly faces a downward-sloping home country demand curve.

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

b. 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.

c. The decrease in consumer surplus is shown by the area $c + d$, of which c is collected as a portion of tax revenues.

3) Home country welfare under antidumping duty (net welfare: e-d)
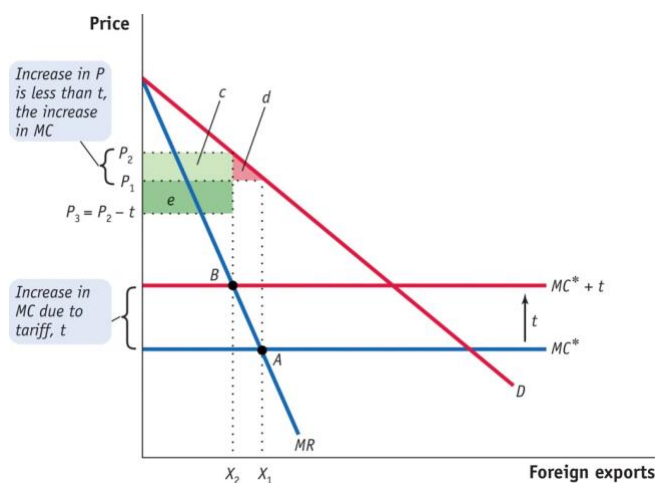
Effect of the Tariff on Home Welfare

The net-of-tariff price that the Foreign exporter receives falls to $P3 = P2 - t$. 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.

Fall in Home consumer surplus: $-(c + d)$
Rise in Home government revenue: $+(c + e)$
Net change in Home welfare: $+(e - d)$

4) Threat of antidumping duty (net loss for home –b-c-d)
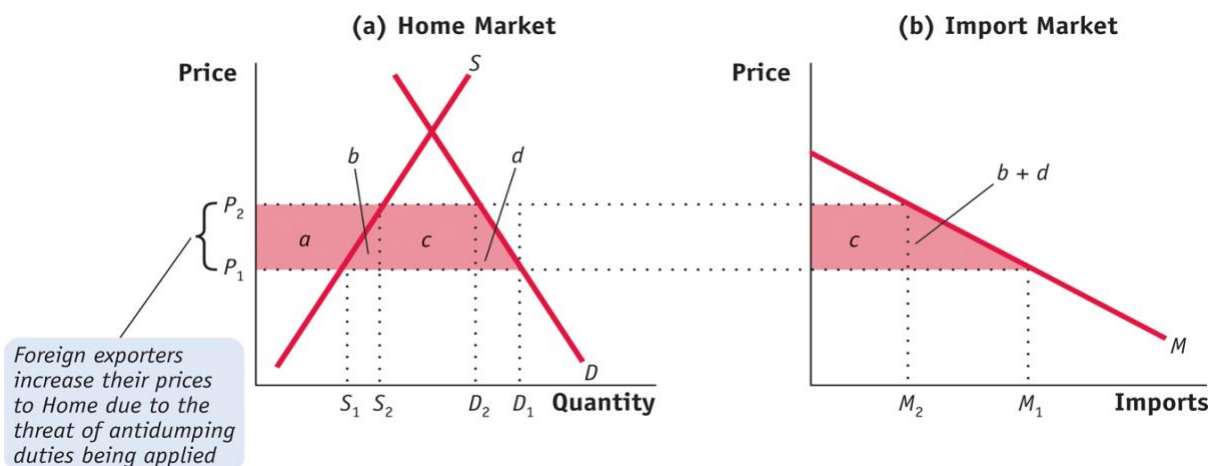
5) A Foreign monopolist is considered to be dumping when its export price is less than its average costs of production or it is selling more cheaply abroad than it does in its local market (or a third market if the local price is unavailable). Under WTO rules, an importing country is permitted to respond with a tariff when a foreign firm sells a product more cheaply abroad than it does in its local market or at less than the cost of production. Charges of dumping have increased in popularity in recent years in not only developed, but also developing countries, as alternatives to "safeguard" tariffs that are allowed in the WTO guidelines.

3. Antidumping v.s. safeguard tariffs

1) The "safeguard" provision in Article XIX of the GATT and Section 201 of the U.S. trade law allows a domestic firm temporary relief from foreign competition when it is determined that rising imports are the "most important cause of serious injury, or threat thereof, to the domestic industry."

2) Due to the difficulty of obtaining a tariff recommendation on competing imports, only 31 cases were filed in the United States between 1980 and 2011. In 12 of the 31 cases, the ITC made an affirmative ruling; the 12 were then recommended to the president, with only 9 affirmed for tariff protection.

Safeguard or Escape Clause Cases

Total 1980–1989	Total 1990–1999	Total 2000–2011	TOTAL 1980–2011		
			Negative ITC Ruling	Affirmative ITC Ruling*	Affirmative U.S. President Decision
19	9	3	16	12	9

China-Specific Safeguard Cases

Total 1980–1989	Total 1990–1999	Total 2000–2011	TOTAL 1980–2011		
			Negative ITC Ruling	Affirmative ITC Ruling	Affirmative U.S. President Decision
NA	NA	7	2	5	1

Antidumping Cases

Total 1980–1989	Total 1990–1999	Total 2000–2011	TOTAL 1980–2011		
			Duty Levied	Case Rejected	Cases Withdrawn
468	428	332	548	456	148

Table: Import Protection Cases in the United States, 1980–2011

3) In contrast to the infrequent use of safeguard or escape clauses, more than 1,228 antidumping cases were filed in the United States in the same period from 1980 to 2011. The reason for their popularity is that the procedure necessary for tariff protection is relatively easier. Moreover, the president does not need to approve the case before the antidumping duty can be applied.

4) As a result, 548 of the 1,228 antidumping cases received tariff protection. Aside from those cases in which duties were applied, 456 cases were rejected and the remaining cases, 148, were withdrawn before the final ruling. By withdrawing the case, the domestic producer, via a DOC intermediary, can coordinate with the foreign competitor on prices and market shares.

5) The end result is a very costly trade policy. An estimate of the costs involved due to antidumping policies amount to the equivalent of the deadweight losses of a 6% tariff that is levied across the board on all imports.

VIII. Export Tariffs (CH10.5) (Same size of welfare loss as import tariff but loss distribution is opposite.)

   "Export tariffs are taxes applied by the exporting country when a good eaves the country. Argentina applies export tariff on many of its agricultural products. Mozambique charges a tariff on exports of diamonds and Thailand charges a tariff on exports of teak wood. The main purpose of these export tariffs is to raise revenue for the government; farmers and other companies do not benefit from the export tariffs because they pay the tax."
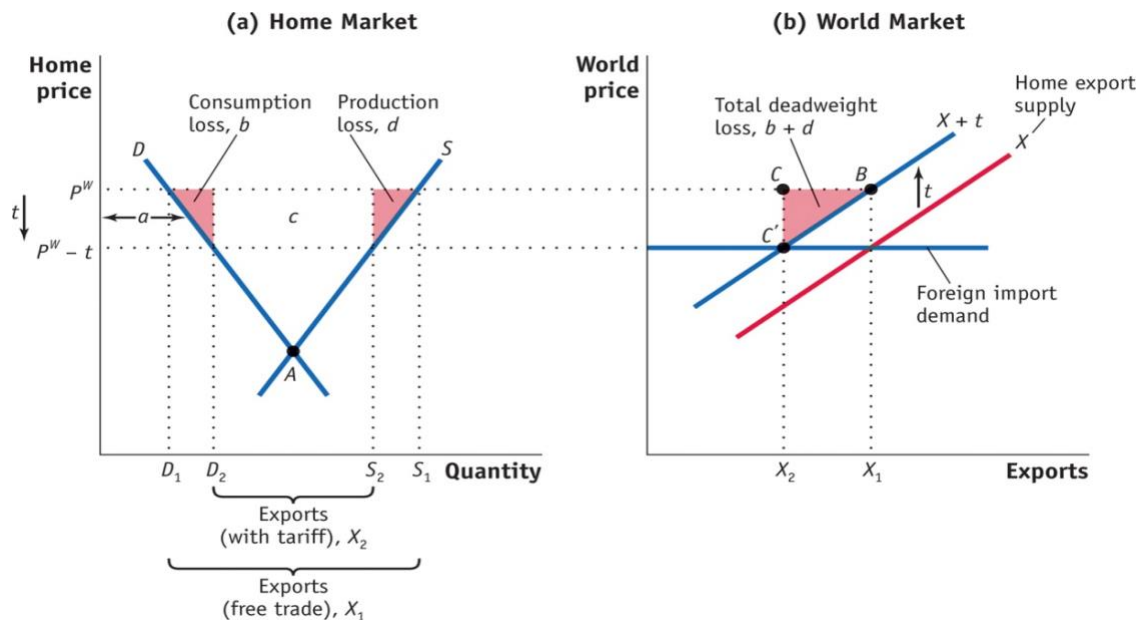
1. Small country case (world price P^W taker) (Note: Foreign import demand curve should be at P^W.)
   1) Point A is the autarky price, P^w is the world price. Under free trade price P^W, Home country exports X_1.
   2) Applying an export tariff of *t* per unit exported decreases the price that Home exporters receive from P^W to $P^W - t$. As a result, the domestic price of the similar good also falls by that amount. Otherwise, if domestic price is higher than export price, all products can be sold at Home with a higher price.
   3) This price fall leads to a decrease in quantity supplied from S_1 to S_2, and an increase in Home quantity demanded from D_1 to D_2. Therefore, export tariffs discourage domestic production but encourage consumption.
   4) The Home export supply curve shifts up by the amount of the tariff because the marginal cost of a unit of exports increases by exactly *t*. The deadweight loss due to the subsidy is the triangle $(b + d)$.
   5) CS: +a   PS: -(a+b+c+d)   GR: +c   Home welfare: -(b+d)
   6) **Consumption loss** *b:* the value of the extra units consumed (between P^W-t and P^W) is less than the cost to the economy of the extra units consumed (P^W). **Production loss** *d:* value of forgone units to the economy (at the P^W exported without tariff) exceeds their cost to the economy (P^W-t).
   7) Did foreign country benefit from Home's export tariff?

2. Large country case (export tariff increases the world price but decreases home price)

(a) Home Market   **(b) World Market**
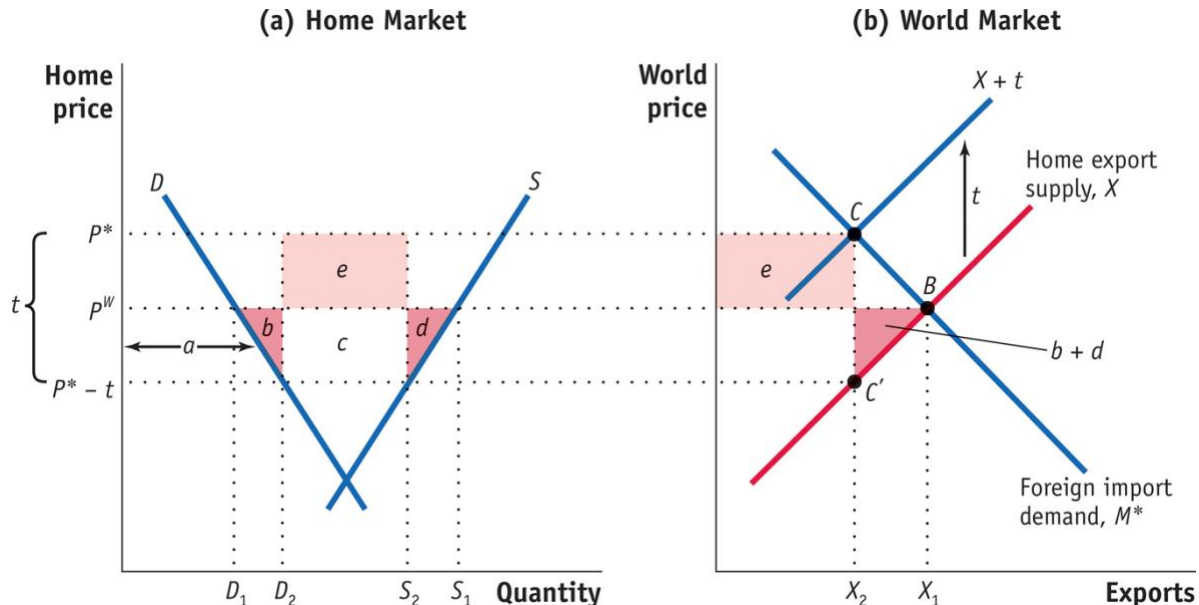
1) The tariff shifts up the export supply curve from X to $X + t$. As a result, the world price increases from P^W to P^*. This increase in the world price is less than the upward shift in export supply of t.

2) The Home price decreases from P^W to $P^* - t$. Home quantity demanded increases from D_1 to D_2, and Home quantity supplied decreases from S_1 to S_2. The deadweight loss for Home is the area of triangle $(b + d)$. Because world price rises from P^W to P^*, Home also has a terms-of-trade gain of area e.

3) CS: $+a$ PS: $-(a+b+c+d)$ GR: $+(c+e)$ Home net welfare: **e-(b+d)**

4) An export tariff leads to a terms-of-trade gain (P_{EX}/P_{IM}) because it reduces the amount supplied to the world market, and increases the price of the export product. Home TOT gain comes at the expense of the foreign country, which is called "beggar thy neighbor" policy

Readings

20190325 PIIE Trade Talks Episode 77: Happy Tariffversary

https://piie.com/experts/peterson-perspectives/trade-talks-episode-77-happy-tariffversary

20190409 PIIE Trade Talks Episode 80: Zeroing: The Biggest WTO Threat You've Never Heard Of

https://piie.com/experts/peterson-perspectives/trade-talks-episode-80-zeroing-biggest-wto-threat-youve-never-heard

U.S. International Trade Commission - Antidumping and Countervailing Duty Investigations

https://www.usitc.gov/trade_remedy/documents/handbook.pdf
https://www.usitc.gov/trade_remedy/731_ad_701_cvd/investigations.htm
https://www.wto.org/english/news_e/archive_e/anti_arc_e.htm

Antidumping, safeguards, and protectionism during the crisis: Two new insights from 4th quarter 2009
https://voxeu.org/article/latest-insights-antidumping-safeguards-and-protectionism-during-crisis

Brookings Podcast: 20190530 How will the Continental Free Trade Area transform Africa?
https://www.brookings.edu/podcast-episode/how-will-the-continental-free-trade-area-transform-africa/

Brookings Upfront: 20190530 Six things to know about Trump's Mexico tariffs
https://www.brookings.edu/blog/up-front/2019/05/31/6-things-to-know-about-trumps-mexico-tariffs/