International Economics I

Lecture Set 8: Trade Policy

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Trade Policy: Goals

- we saw that trade, in general, is beneficial (with exceptions)
- trade policy can limit (or foster) trade between countries
- there are various instruments of trade policy, e.g.:
  - tariffs and quotas on import
  - subsidies and voluntary restrictions to export
- how should trade policy be conducted?
- still an open question
- first, we have to evaluate:
  - the effects of each intervention on prices and quantities
  - costs and benefits

Tariffs

- tariff = tax on import
  - **fixed** tariff: applied to each unit of imported good
  - **ad valorem** tariff: applied as a percentage of the value of imported good
- it is the oldest instrument of trade policy
  - main source of government revenues until the introduction of personal income tax
  - mainly used to protect national industries (e.g., agriculture)

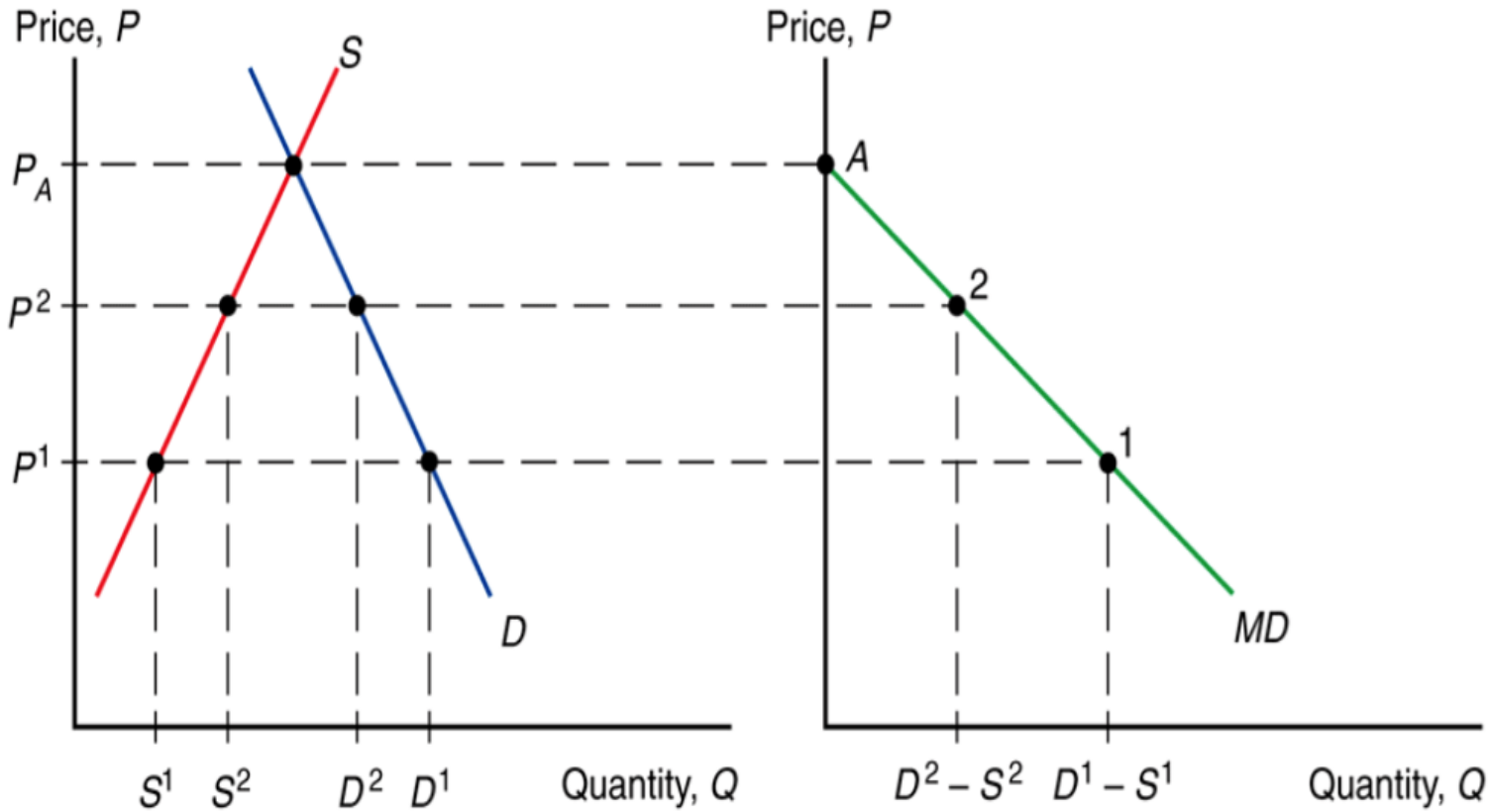
How to Evaluate the Effects? Simple Theoretical Framework

- So far we have modeled general equilibrium (prices adjust in all sectors and markets)
- But trade policy is often directed at very specific sectors
- In this case is not unreasonable to think in partial economy → trade policy will have small impact on factor markets nor induce income effects in consumption
- Implied assumption: The sector is small relative to the rest of the economy
- Then we can analyze the effects of the trade policy on a particular sector independently from the rest of the economy

How to Evaluate the Effects? Simple Theoretical Framework

- we use standard tools from demand and supply to determine equilibrium quantities and prices
- 1 good
- take as given domestic and foreign demand and supply
- study the effects on
  - price and quantities (produced and consumed)
  - costs/benefits (surplus) for consumers and firms
  - welfare of the country

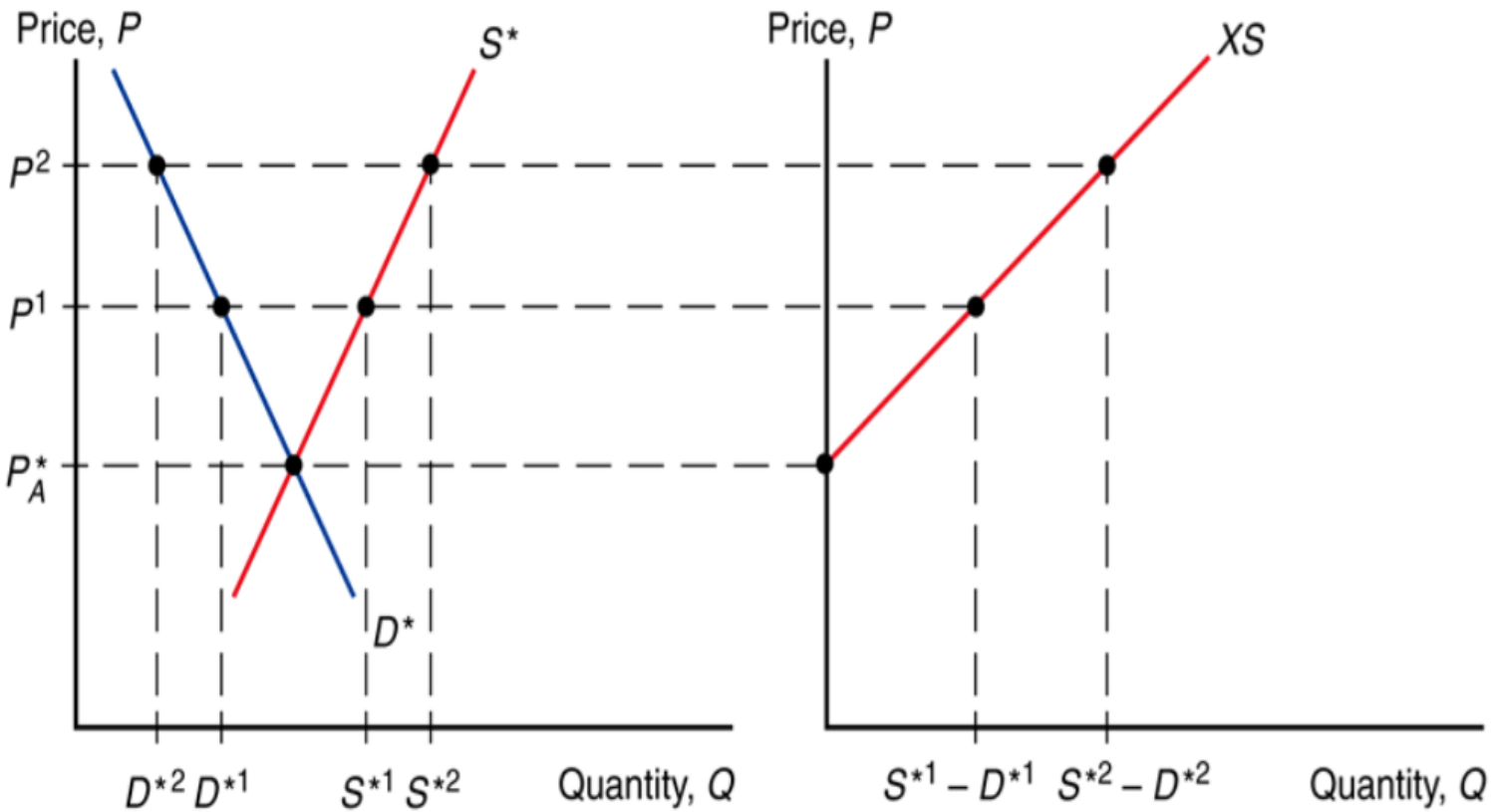
Demand, Supply and Import Demand



Demand, Supply and Import Demand

- given demand and supply
  - autarky equilibrium price is P_A
- for given price $P^1 < P_A$:
  - supply is smaller than demand: $S^1 < D^1$
  - import demand $MD = D^1 - S^1$
- for given price $P^2 < P^1$
  - supply is smaller ($S^2 < S^1$) and demand is larger ($D^2 > D^1$)
  - import demand is larger: $D^2 - S^2 > D^1 - S^1$

Demand, Supply and Foreign Export Supply



Trade and World Equilibrium

- domestic import = foreign export (balanced trade)

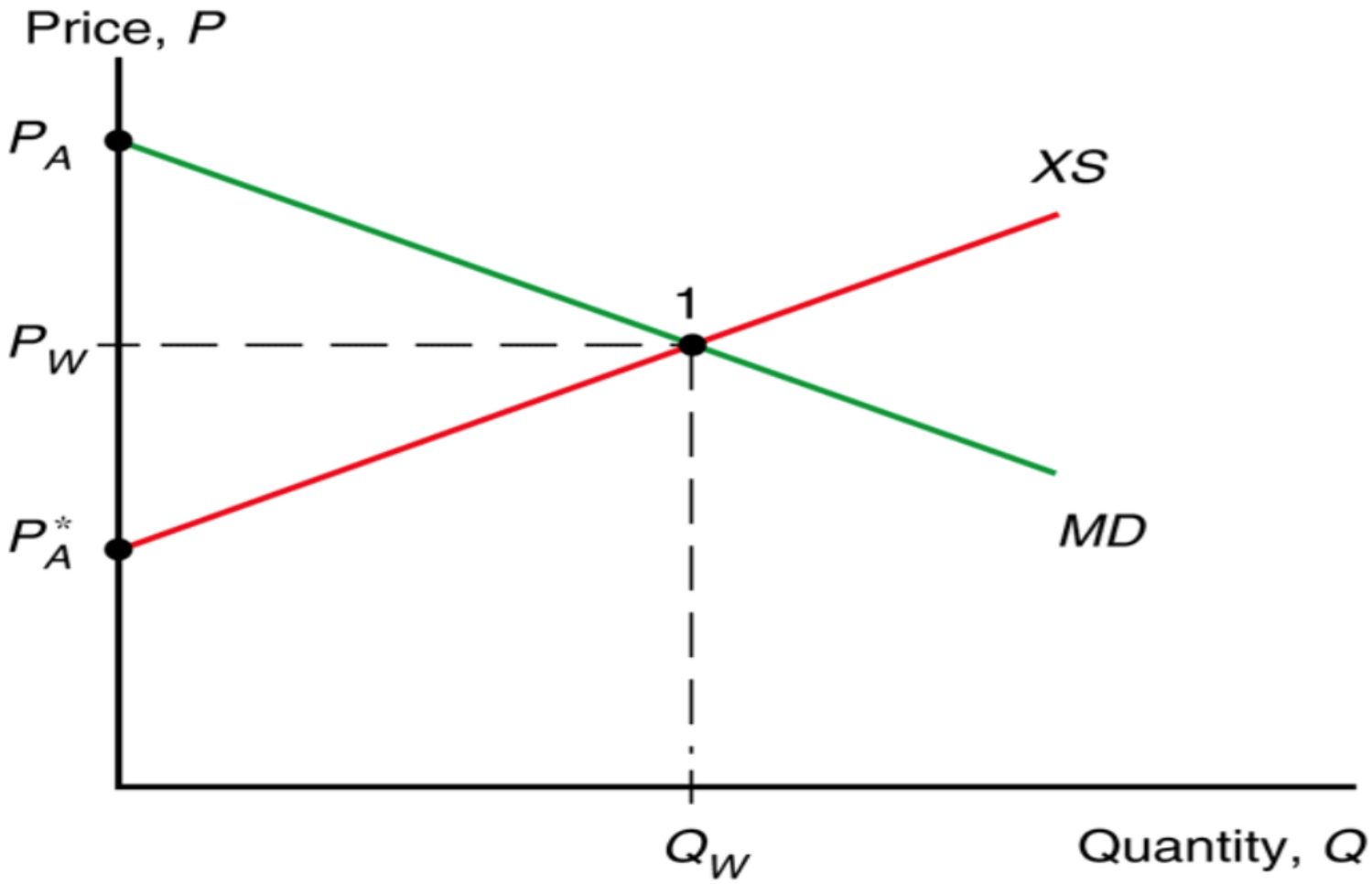
$$D - S = S^* - D^*$$

- equivalent to: world demand = world supply

$$D + D^* = S^* + S$$

- world equilibrium price: P_W
- equilibrium trade: Q_W
- note that the equilibrium P_W price is between both autarky prices
- the relative size of the countries will affect the slopes of the import demand/ export supply curves
- in the limit we will be in a Small Open Economy, where countries cannot affect international prices

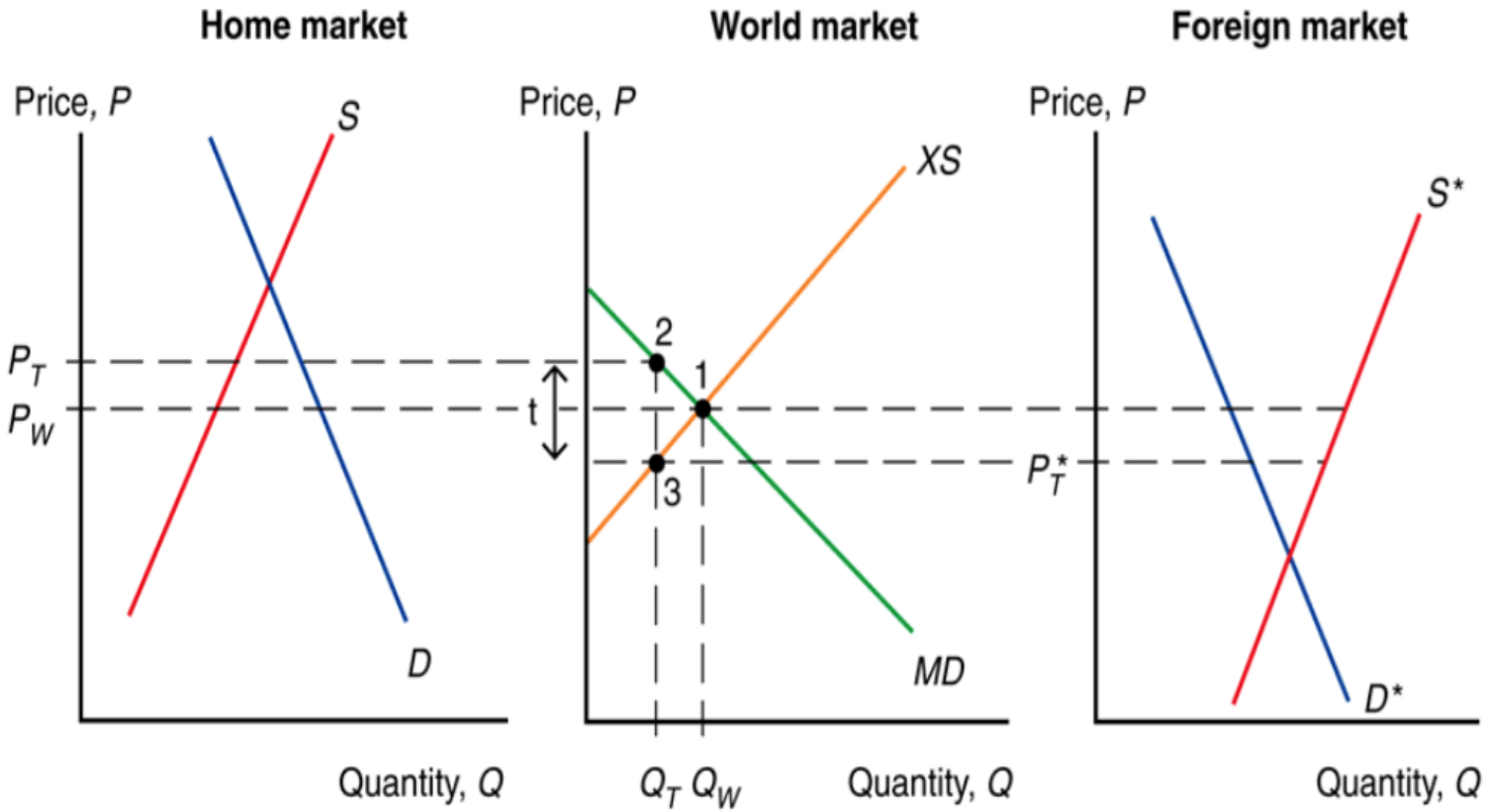
Trade and World Equilibrium



Effects of a Fixed Tariff

- consider a fixed tariff t:
  - import price becomes $P_T = P_T^* + t > P_W > P_T^*$
- effect of tariff on prices:
  - is partial on import price: $P_T - P_W < t$
  - the rest is reflected in the foreign export price: $-t < P_T^* - P_W < 0$
    - the more so, the steeper (inelastic) the XS
- effect of tariff on quantities:
  - domestic import demand falls
  - foreign export supply falls
  - trade falls

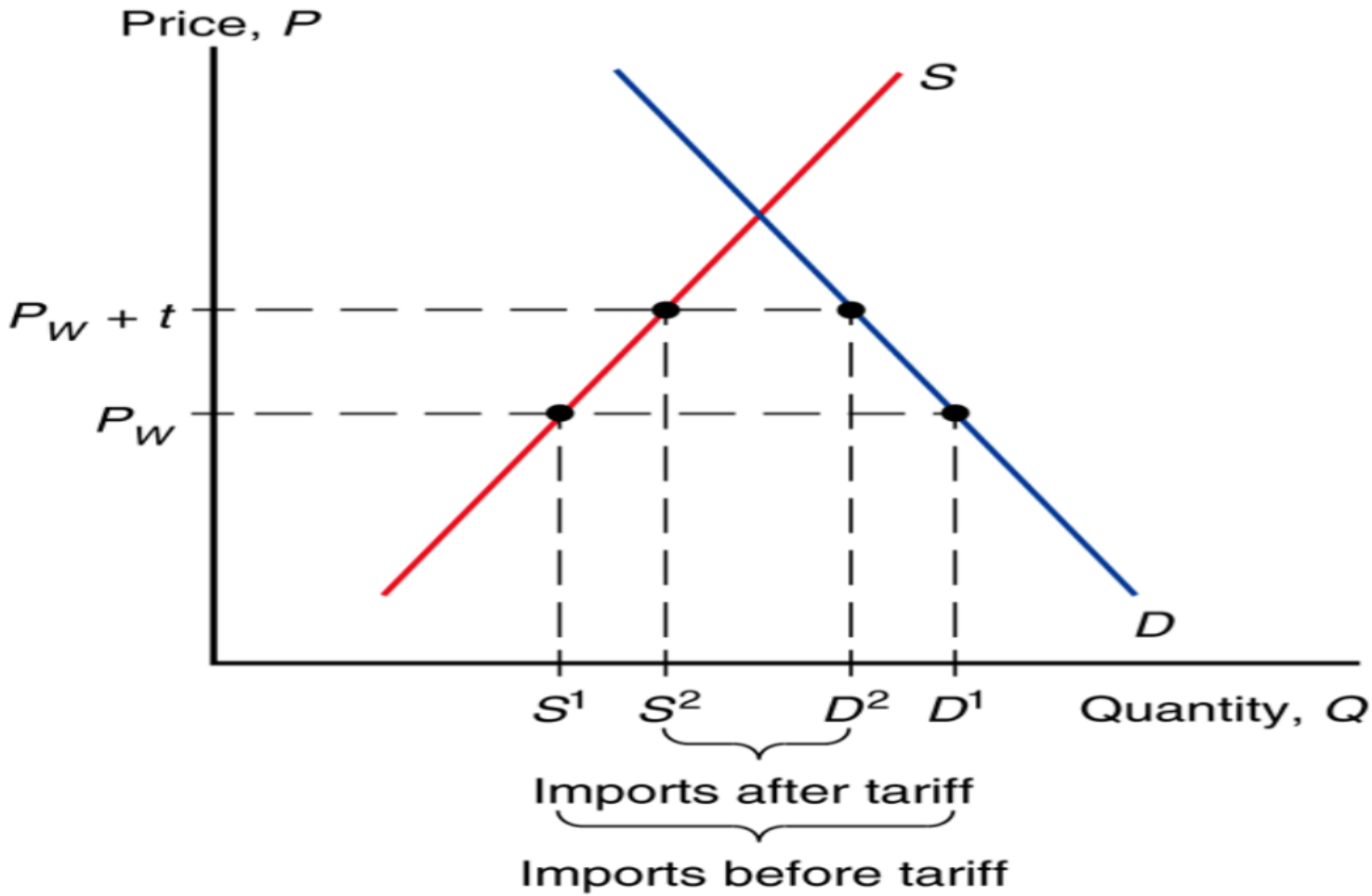
Effects of a Tariff (on a large country): Graph



Effects of a Tariff: Small Open Economy

- if the domestic country is small relative to the foreign
  - its demand can't affect export price (XS flat at P_W)
  - the tariff is entirely charged upon the import price: $P_T = P_W + t$
  - domestic import demand falls
  - foreign export supply is unaffected

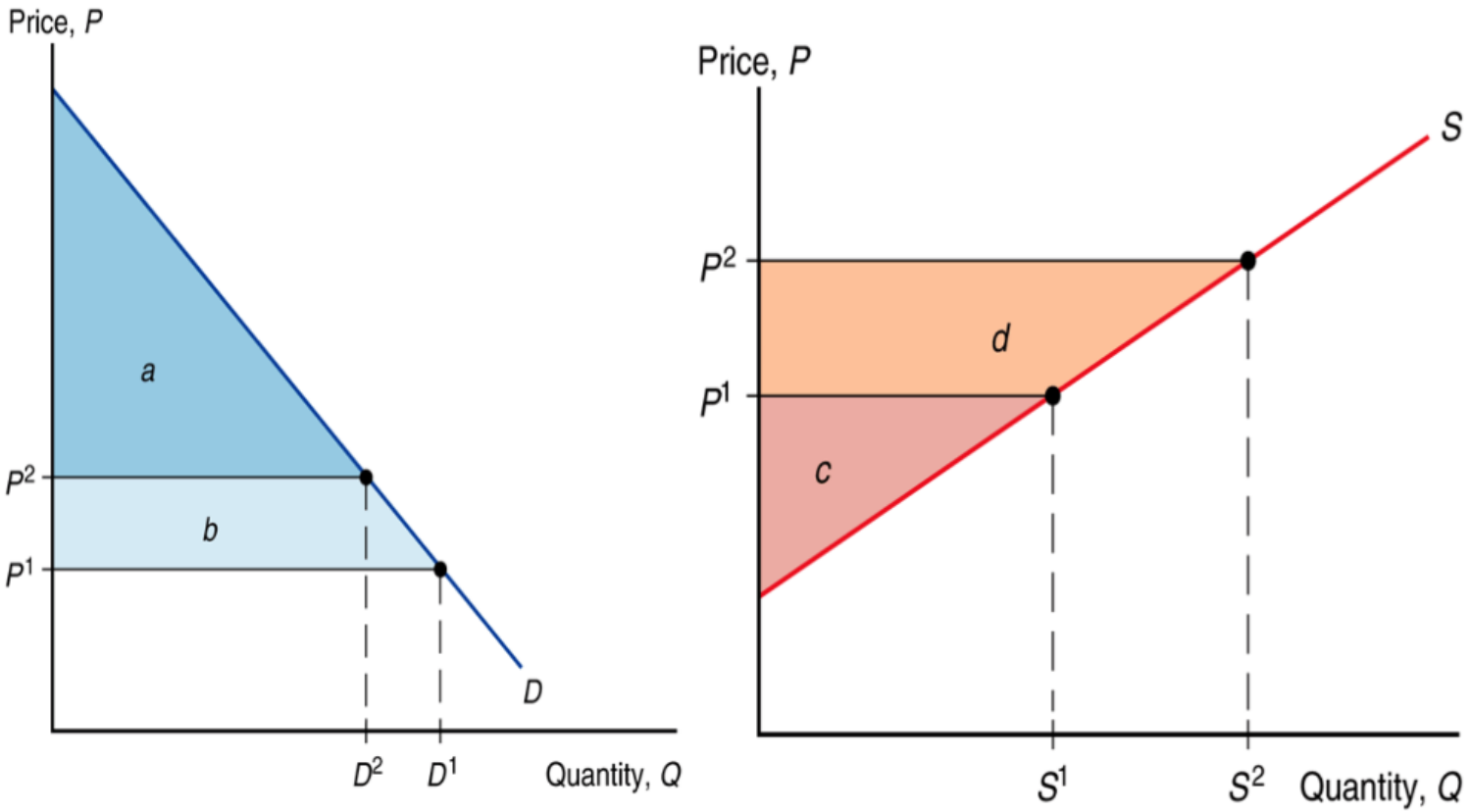
Effects of a Tariff in a SOE: Graph



Costs and Benefits of a Tariff

- recall: the demand curve represents mg benefit of consumption and supply curve represents mg cost of production
- compute costs and benefits in terms of:
  - variation in consumer's surplus:
    - difference between the price that he/she is willing to pay and the price paid for each unit
    - graphically: area between demand and equilibrium price
    - decreasing in the equilibrium price
  - variation in producer's surplus:
    - difference between the equilibrium price and the minimum price he/she is willing to charge for each unit
    - graphically: area between equilibrium price and supply
    - increasing in the equilibrium price
  - government revenues: imported quantities x tariff

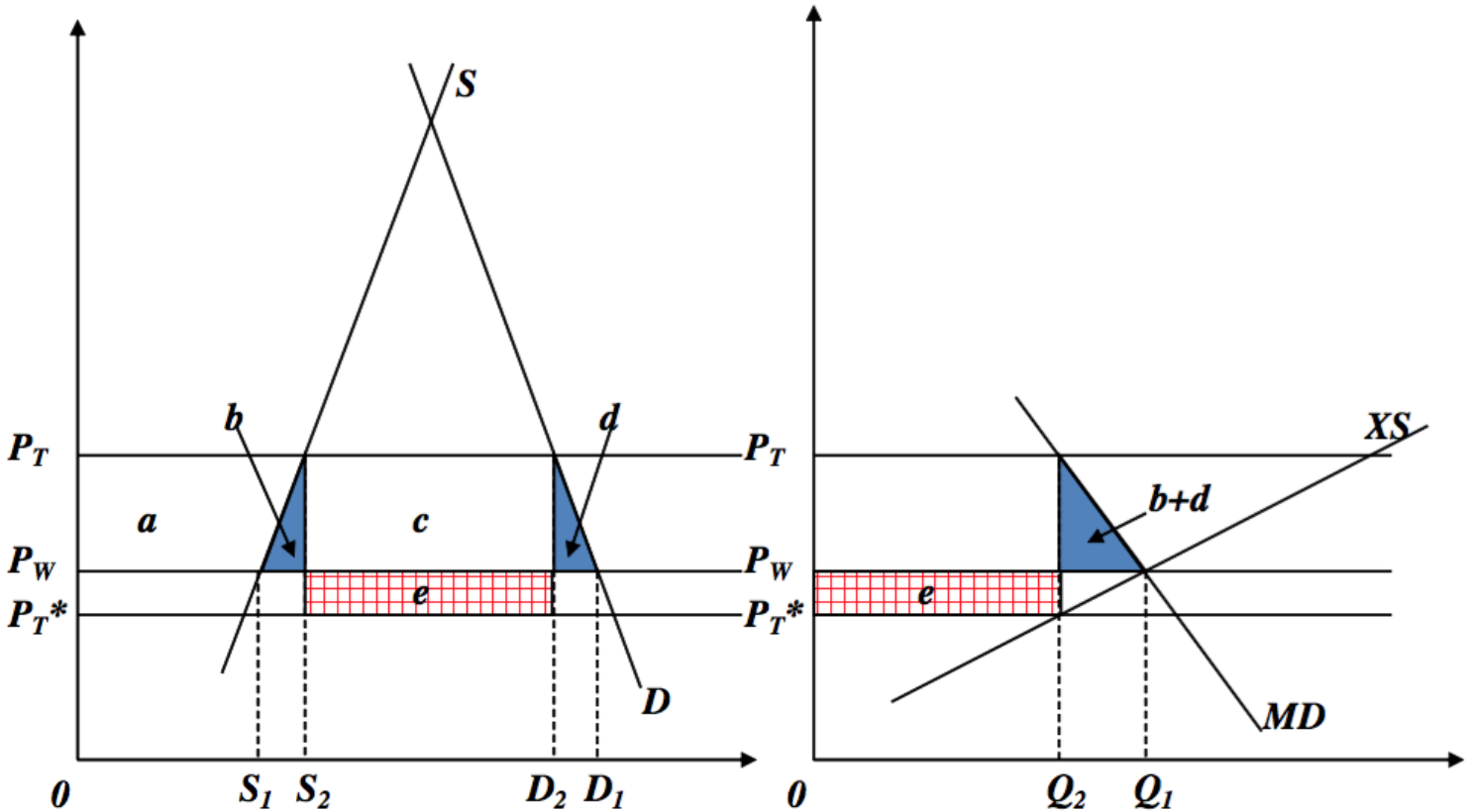
Consumer's and Producer's Surplus: Graph



Costs and Benefits of a Tariff

- a tariff increases the price:
  - reduces consumer's surplus: $-(a+b+c+d)$
  - increases producer's surplus: $+a$
- government revenues: $t * (D_2 - S_2) = c + e$
- net welfare effect is $e - (b+d)$
  - efficiency loss: $-(b+d)$
    - due to distortion in production (too much) and consumption (too little)
  - gains from terms of trade improvement: e
    - due to the fact that t reduces the price received by the foreign producer (steels him/her)
- a tariff $t > 0$ may generate gains as long as it affects the terms of trade (!!!)

Costs and Benefits of a Tariff: Graph



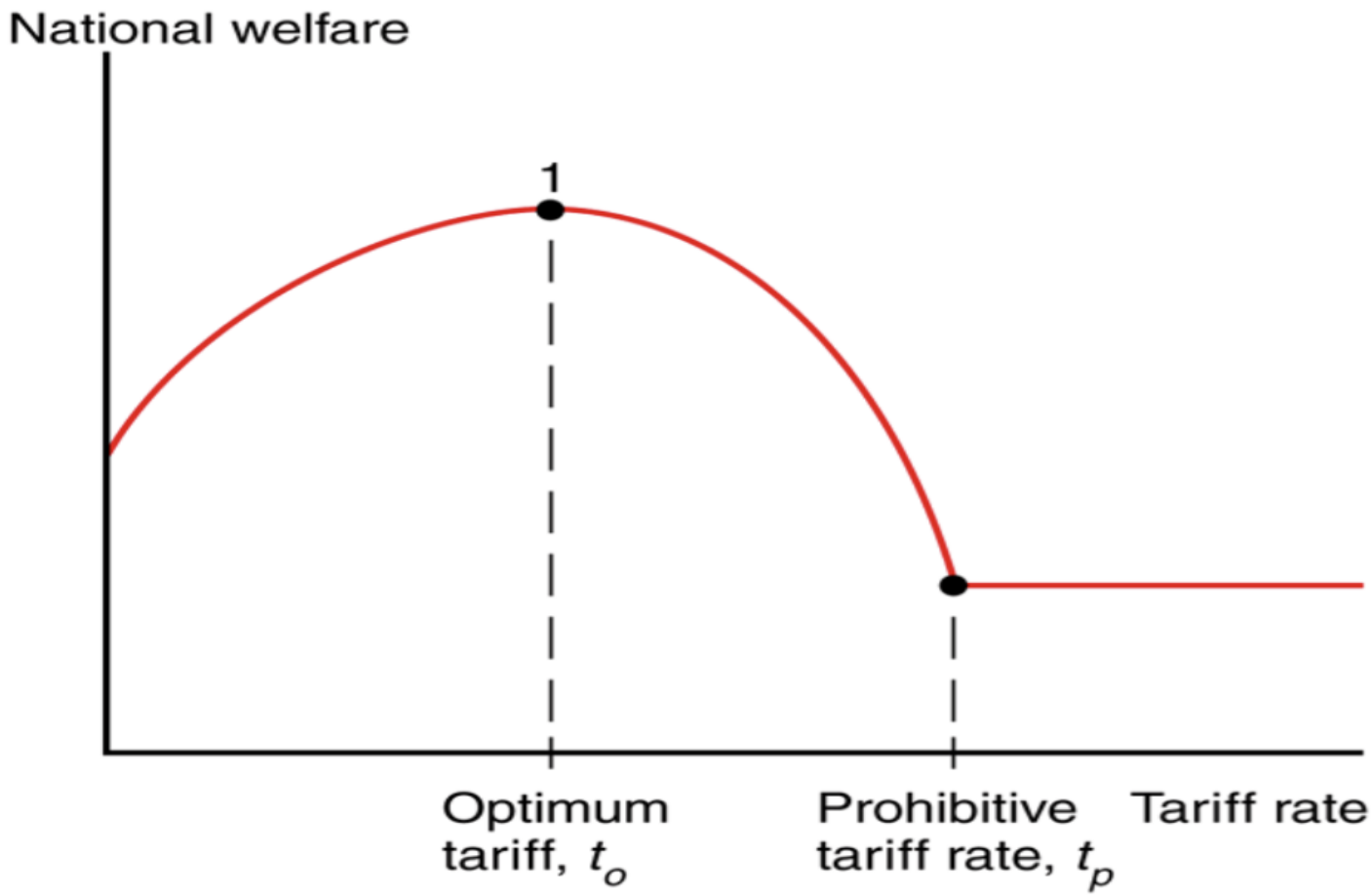
When tariffs generate welfare gains?

- If $e > b + d$
- e represents gains from terms of trade: recall $tot = p_x/p_m$
- in the case the country is large: the fall in the demand induced by tariffs decrease the international price of imports $\downarrow p_m$
- whereas in a small economy there are no terms of trade effects
- large countries have room for *Beggar-thy-neighbor* policies!
- welfare gains at the expense of foreign producers!
- the more inelastic XS is, the highest is the gains from tot.

Optimal tariff

- in large country, an increase in t:
  - increases tariff rate $\uparrow P_W - P_T^*(t) \rightarrow \uparrow e$
  - decreases the tax base $\downarrow Q \rightarrow \downarrow e$
  - distorts production and consumption $\uparrow P_T - P_W$ and $\downarrow Q \rightarrow \uparrow (b+d)$
- optimal tariff maximize $e - (b+d)$
- if t is too high, low imports and high distortions
- if t is too low, low gains from tot
- the more inelastic is XS the higher is the optimal tariff

Optimal Tariff: Graph



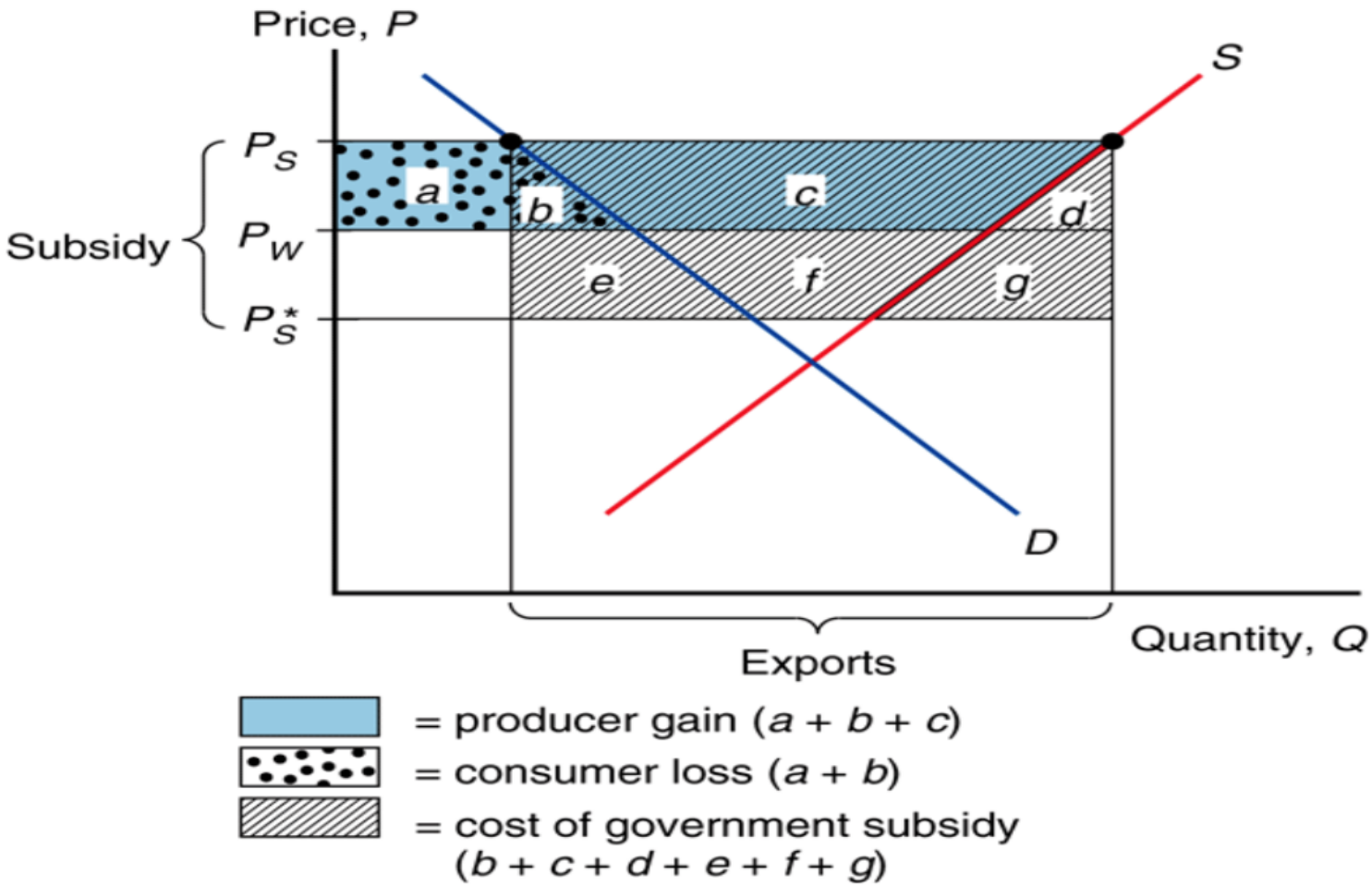
Limitations of the optimal tariff

- obviously cannot be used by small country
- even if there are gains for an individual country, the "optimal tariff" generates global welfare losses!
- the gains from terms of trade come at the expense of the other country → zero sum game!
- other countries may retaliate → trade war!
- motivation behind the formation of GATT (now the WTO)

Effects of an Export Subsidy

- subsidy = payment (fixed or ad valorem) made to exporters
- effects of a fixed subsidy s on prices/quantities
  - domestic price increases $P_W < P_S < P_W + s \rightarrow D \downarrow$
  - export price falls $P_W - s < P_S^* < P_W \rightarrow S \uparrow$
- effects of a fixed subsidy s on quantities
  - domestic demand falls
  - domestic supply increases
  - domestic export supply increases

Effects of an Export Subsidy: Graph



Effects of an Export Subsidy

- effects of a fixed subsidy s on welfare
  - consumer loss: $-(a+b)$
  - producer gain: $+(a+b+c)$
  - gov't spends (loss): $-(b+c+d+e+f+g)$
  - net loss: $-(b+d+e+f+g)$
    - efficiency loss: $-(b+d)$
    - loss by terms of trade deterioration: $-(e+f+g)$
- in this simple framework export subsidy always generate losses
- why it exists?
  - political influence of producers (e.g. lobby)
  - production externalities / dynamic gains

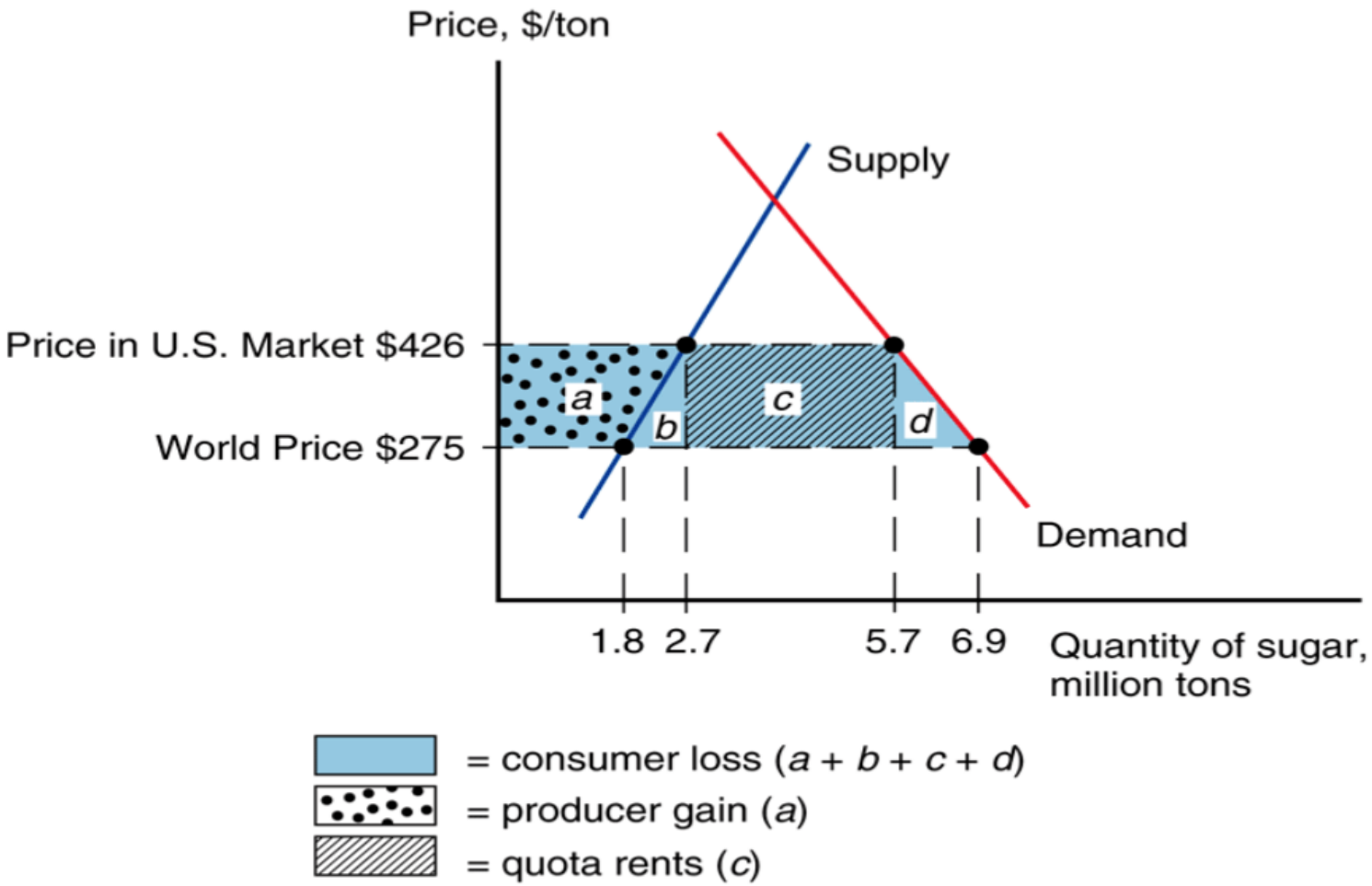
Import Quotas

- quota ($\bar{Q}$) = direct restriction to imported quantities
- give some firms (often foreign government agencies) a license to import (up to $\bar{Q}$)
- for given int'l price P_W:
  - $D > S + \bar{Q}$
  - for D to fall and S to rise, national price P has to rise
- same effects on prices and quantities as a tariff aimed at reducing import to $\bar{Q}$
- differences with respect to a tariff:
  - no tariff revenue for the government
  - the licensee gains the equivalent (buys at P_W, sells at P) = quota rents

Import Quotas: Welfare Effects

- consumer's loss: $-(a+b+c+d)$
- producer's gain: $+a$
- quota rent: $+c+e$
  - only $+c$ in a small open economy
- net effect:
  - if rents accrue to domestic importers: $e-(b+d)$
    - only $-(b+d)$ in a small open economy
  - if rents are appropriated by a foreign gov't: $-(b+c+d)$
    - e payed by foreign producer → remains abroad
    - c payed by domestic consumer → goes abroad
    - same in a small open economy

Import Quotas: Graph (SOE)



Other Instruments

- Voluntary Export Restriction (VER)
  - equivalent to an import quota, but imposed by the exporter
  - since the rents of the restriction are absorbed by the exporter, the importer always lose
- local content requirements
  - requires that a share of (quantity or value of) final good be produced domestically
  - limits import of intermediate goods/raw materials
  - fosters export of intermediate goods/raw materials
  - is reflected by the increase in the final consumer price
- subsidies to export credit
- state purchases
- administrative barriers

Summary: Main Trade Policy Instruments

TABLE 9-1 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

Topics on Trade Policy

- the partial equilibrium framework is a useful start but misses important aspects of trade policy
  - general equilibrium effects
  - political economy of trade policy
  - preferential (regional) trade agreements
  - dynamic gains / losses

General Equilibrium Effects

- it is relatively easy to incorporate import tariffs in a GE framework
- let's use the specific factors model: 2 goods (M, A), Small Open Economy (no effect on the international price p^I), labor is the only mobile factor
- a tariff in the imported good (suppose it is A):
  - increases the price faced by domestic consumers/producers: $p_A = p_A^I + t$
  - distorts the consumer's decision (MRS): $\frac{MUD_M}{MUD_A} = -\frac{p_M^I}{p_A^I + t}$
  - distorts the producer's decision (MRT): $\frac{MPL_M}{MPL_A} = -\frac{p_A^I + t}{p_M^I}$
- $D_M/D_A \uparrow$ and $Q_M/Q_A \downarrow$
- it is easy to see that the new relative price $p = \frac{p_M^I}{p_A^I + t}$ is closer to the autarkic price and lower utility of consumers

General Equilibrium Effects

- but tariff generates revenue
- suppose that part of the tariff revenue goes back to the consumer as a lump-sum transfer T
- new budget constraint: $p_M^I D_M + (p_A^I + t) D_A = \tilde{V} + T$
- it generates a positive income effect (but in a SOE it is never higher than the substitution from the tariff!)
- also depends how well the government uses the tariff revenue
- **Large Economy:**
  - international prices also respond $p_M^I \uparrow$ and $p_A^I \downarrow \rightarrow$ increase in tot!
  - note that the tariff in one good changed the international price of the other good!

General Equilibrium Effects

- what about input prices? let's use the HO model
- the tariff will increase the price of imports $p_M^I/(p_A^I + t)$
- by the Stolper-Samuelson theorem, the owners of the factor used intensively in A will gain and the others will lose
- tariff breaks factor price equalization, producers of home face different relative prices than the producers of foreign $p_M^I/(p_A^I + t) \neq p_M^I/p_A^I$!
- **Large country**: tariffs change the relative international price p_M^I/p_A^I and that changes the input prices of the other country!

Political Economy of Trade Policy

- we saw that countries often implement trade policy when:
  - it is not optimal to do so (e.g. export subsidies)
  - it is optimal for a country but not for world's welfare (e.g. large country's tariffs)
- how can we justify such policies?
- how can we move towards policies that are welfare improving?

Political Economy of Trade Policy

- why politicians choose "bad" trade policy
- populism
  - if the "median voter" benefits from these policies → politicians will propose it to get elected
  - example: HO with high and low skill workers, foreign is relatively abundant with low skill workers
  - opening to trade leads to a decrease in the wages of low skill workers (Stolper-Samuelson)
  - low skill workers will be against free trade

Political Economy of Trade Policy

- why politicians choose "bad" trade policy
- lobby
  - trade often leads to diffuse benefits across a lot of people (a small decrease in the price of a certain good)
  - but very high and concentrated costs (usually to one specific sector)
  - sectors subject to import competition will lobby for protection
  - in the partial eq. framework
    - producers always gain with tariffs, but gain more if the elasticity of supply is high (region a)
    - consumers always lose, but lose more if the elasticity of import demand is high ($b + d$)
  - for a more complex analysis see Grossman and Helpman (1994) "Protection for Sale"

Political Economy of Trade Policy

- examples of protectionism:
  - EU: "Common Agricultural Policy' (CAP)
  - USA: recent tariffs on steel and aluminium
  - Japan: no rice imports

- how to move to a free trade situation?

- international coordination: GATT (1948) / WTO (1995)

- based on principles:
  - **non-discrimination**: the same tariffs are applied to all countries (all countries are considered "Most Favored Nation" (MFN)
  - **reciprocity**: if a member decreases its tariffs it should expect similar behavior from other nations
  - **binding**: countries cannot change their tariffs without renegotiation

- **exceptions**: low developed countries, "Preferential Trading Agreements" (PTA), safety/humanitarian/environmental reasons

Preferential Trade Agreements (PTA)

- types of PTA:
  1. **Free Trade Areas:** low tariffs between members, but each country sets its own tariffs with other countries (e.g. NAFTA)
  2. **Custom Unions:** Members set common tariffs with other countries (e.g. MERCOSUR)
  3. **Common Area:** Custom union + free movement of factors (e.g. EU)

- PTA may foster trade but can also have negative consequences:
  - **Trade Creation:** increase trade between member countries
  - **Trade Diversion:** can induce countries to stop importing from countries outside the PTA

- trade diversion can be negative if induces a country to import a good from a less productive country than before

PTA & Global Value Chains

- PTA interacts with more complex trade policies in non-trivial ways
- an important trend in international trade is the emergence of global value chains
  - Intermediates inputs account for 2/3 of total trade
  - different stages of a production process (e.g. R&D, design, production of parts, assembly, marketing and branding) are increasingly fragmented across firms and countries
- how can we define what is produced inside a PTA member and what is not?
- another trade policy used: **Rules of Origin** (RoO)

Rules of Origins

- Rules of Origins can be of two types
  1. **Value-added requirements**: At least X% of the the value of the final good must be "domestic"
  2. **Change of tariff classification**: Some inputs cannot be sourced (at all) from outside the PTA

- a final good producer located in the PTA has two options:
  1. Comply with RoO: in this case it can export to PTA members at preferential tariff rates
  2. Not comply with RoO: source inputs from the most efficient producers around the world, but faces high tariffs when exporting to PTA members

Rules of Origins

- Theoretically, it is has long been known that RoO **distort sourcing** and lead to **trade diversion** in intermediate goods (e.g. Grossman, 1981)

- In a large survey by the International Trade Centre, RoO emerge as **the most problematic non-tariff** measure faced by manufacturing firms

- Conconi et al (AER, 2018) studied RoO in the context of NAFTA
  - they found that RoO on final goods acted as input tariffs, distorting sourcing decisions and giving rise to **trade diversion in intermediate goods**
  - this distortion was larger for the Mexican producers who had particular interest on the North American export market

- Trade policy became very complex and tariffs are generally just a small part of the picture

Dynamic Gains / Losses from Trade

- in all the models we saw, the effects of a trade liberalization unfold right away
- in reality, markets are not frictionless and most of workers/firms' decision are dynamic
  - firms have to make investment decisions (at home and abroad) and it takes to build
  - it is costly to hire and fire workers
  - unemployed individuals cannot find jobs right away (search frictions in the labor market)
  - human capital (e.g. training and experience) is not fully transferable across industries
  - location decisions (e.g. industries gaining are in another region than industries losing)

Dynamic Gains / Losses from Trade

- the cost of adjustment to trade are relevant:
  - In the U.S., regions more exposed to import competition from China are associated to lower wages, higher unemployment, less stable marriages and political polarization (David Autor)
  - Trade liberalization experiences in Brazil and Colombia led to increase in informality in the most affected regions even 10 years later
- sometimes the effects of a trade reform are felt 15-20 years later!
- institutional context matters for the adjustment speed: rigid labor markets tend to do worse

Dynamic Gains / Losses from Trade

- there are still a lot of discussion on what are the optimal policies to remedy the adjustment
- theory says that we should speed up adjustment and help the losers
- most of trade reforms generate gains to future generations at a cost of old generations
- as in the HO model, we should transfer the money from the winners to the losers
- two examples of policies:
  - US: Trade Adjustment Assistance
  - EU: European Globalisation Adjustment Fund
- it involves some form of retraining/job search assistance for workers and credit/recovery plans for firms