

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)

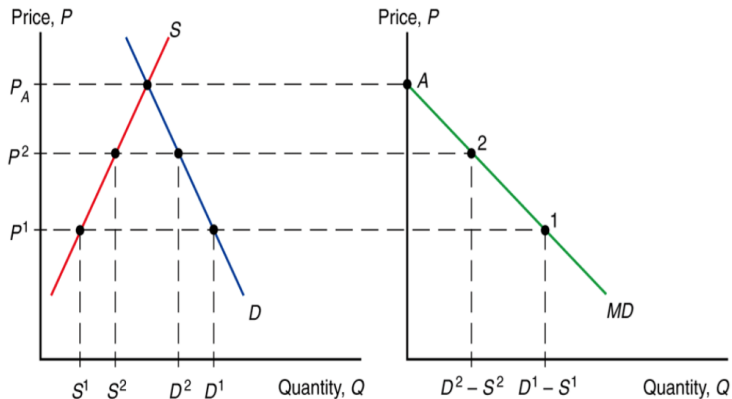
How to Evaluate the Effects? Simple Theoretical Framework

- 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

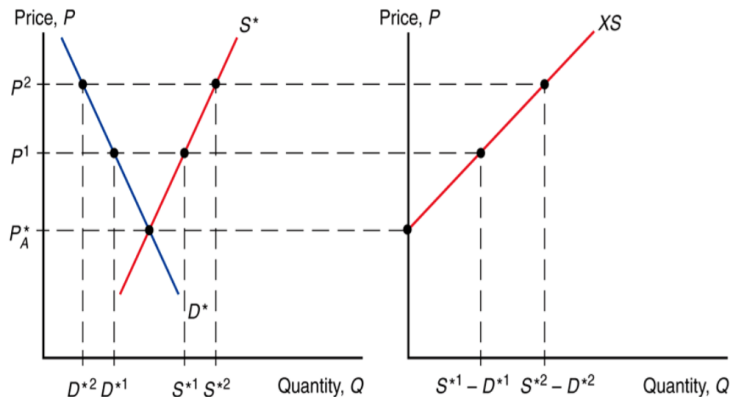
Demand, Supply and Import Demand



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)

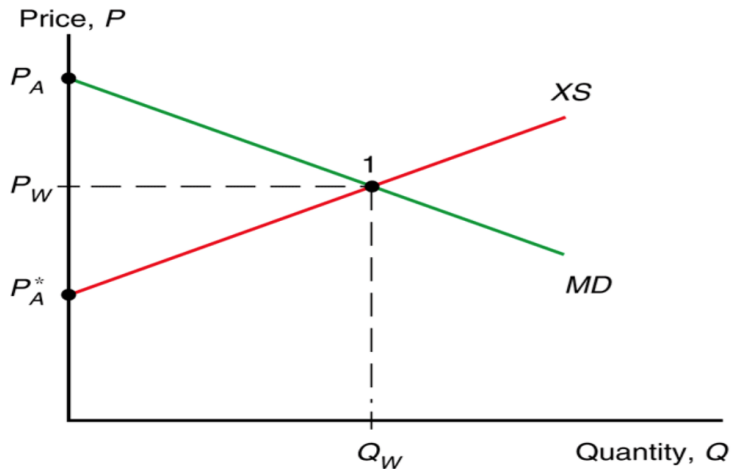
$$D - S = S^* - D^*$$

- 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

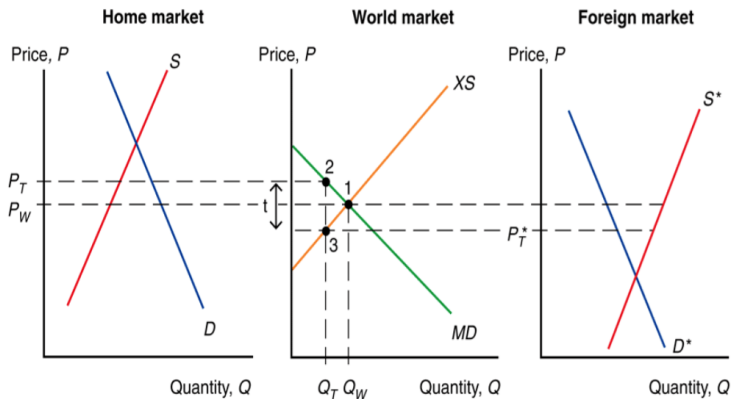
Trade and World Equilibrium



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

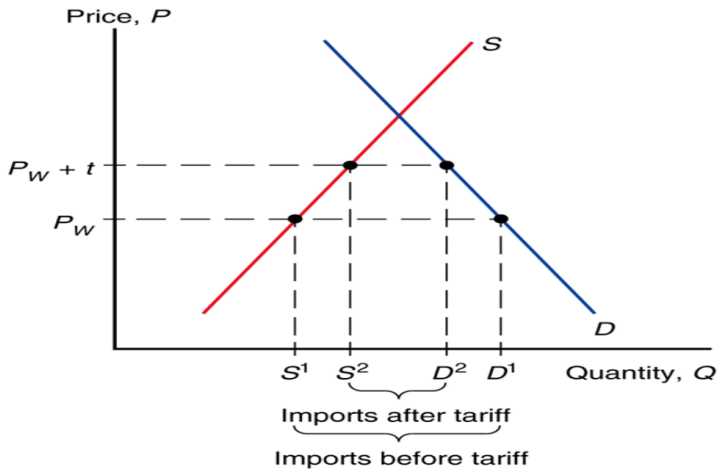
Effects of a Tariff (on a large country): Graph



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

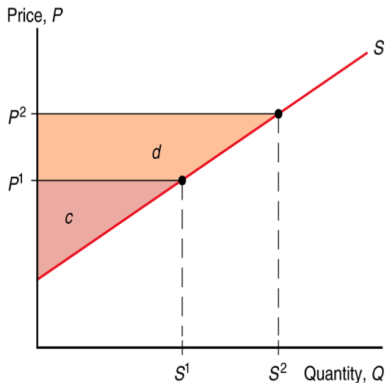
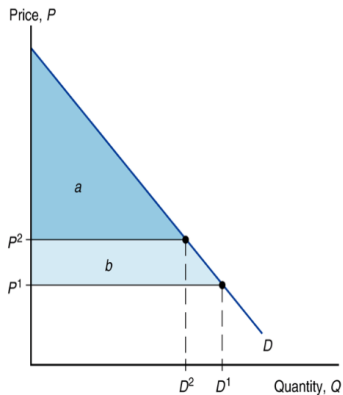
Effects of a Tariff in a SOE: Graph



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 \times tariff

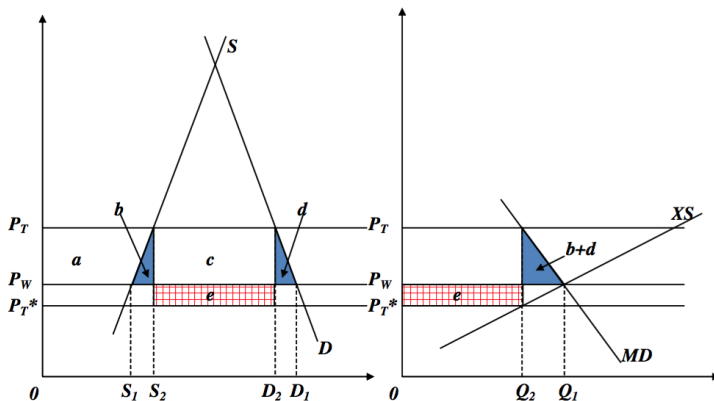
Consumer's and Producer's Surplus: Graph



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 (steals 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



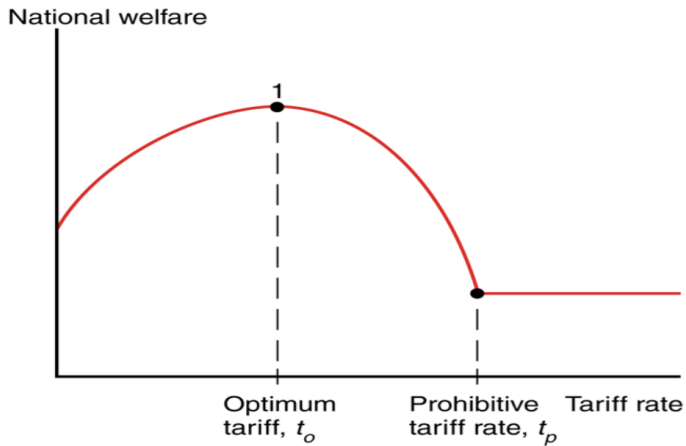
When tariffs generate welfare gains?

- 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



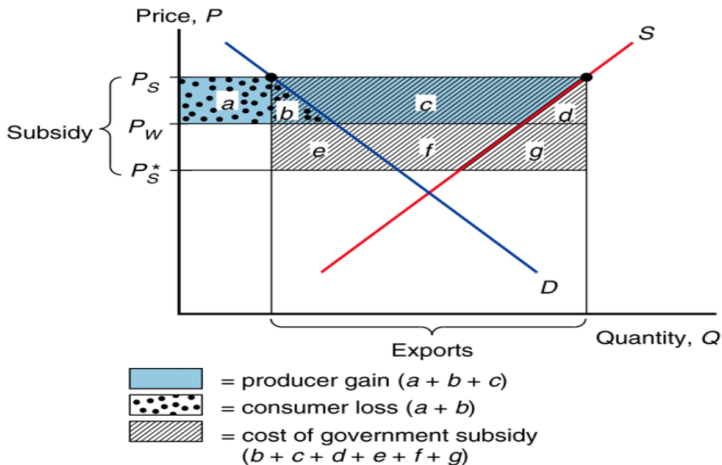
Limitations of the optimal tariff

- 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

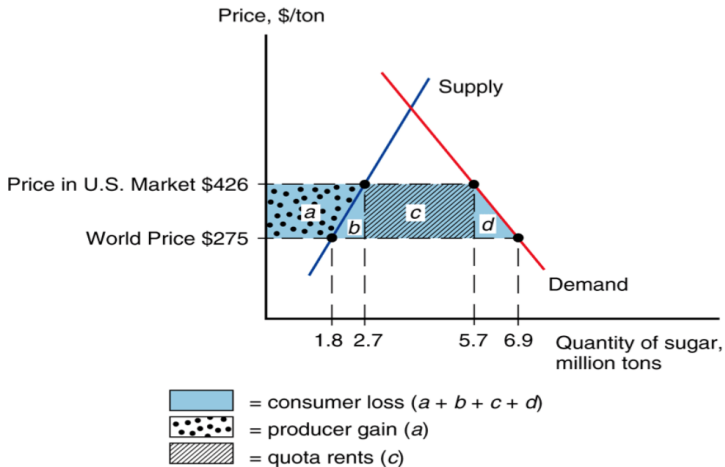
Import Quotas

- 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 paid by foreign producer \rightarrow remains abroad
 - c paid by domestic consumer \rightarrow 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): $\frac{MU_D M}{MU_D A} = -\frac{p_M^I}{p_A^I + t}$
 - 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 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