

Pollution and Globalization (Trade and FDI)

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Why do countries trade?

- Because they are different:
 - i) Different *relative* labor productivity across sectors.
 - ii) Different *relative* endowments of inputs (e.g., capital, labor, natural resources)
 - iii) Different institutions (e.g. property rights) and different laws (e.g. environmental protection)

A caveat

- *Similarities* across countries can also promote trade.
- Volume of trade amongst “similar” countries is greater than volume amongst “very different” countries.
- “Intra-industry trade” (e.g. importing and exporting autos) takes advantage of specialization and decreasing average costs.
- Similar countries may also benefit from being part of a network of production.

Nevertheless....

- “Differences” rather than “similarities” are probably a more fundamental reason for trade, and are certainly more important for North-South trade.
- Differences are the basis for comparative advantage.
- A country’s comparative advantage depends on its “opportunity costs”

What are opportunity costs?

- The opportunity cost of any action is the value of the best alternative to that action: it is what you give up in order to perform the action.
- Ricardo-like example: Table shows amount of labor needed in each country to produce food or cloth

	Labor needed for one unit of Food	Labor needed for one unit of Cloth
US	1	1
Canada	3	6

Absolute VS Comparative Advantage (CA)

- US has *absolute advantage* in both sectors
- US opportunity cost of one unit of food is one unit of cloth
- Canada's opportunity cost of one unit of food is $\frac{1}{2}$ unit of cloth.
- Canada has *lower opportunity cost = comparative advantage* in production of food.
- US has *lower opportunity cost = comparative advantage* in production of cloth
- Comparative advantage results from difference, across countries, in *relative* productivity between sectors.
- Pattern of trade driven by CA, not by absolute advantage.

Compare two examples

	Labor needed for one unit of Food	Labor needed for one unit of Cloth
US	1	1
Canada	3	6

	Labor needed for one unit of Food	Labor needed for one unit of Cloth
US	1	1
Canada	6	6

- Example on the right: opportunity cost of food is the same in both countries. Neither country has a CA in production of either commodity. These countries do not benefit from trade. This is a “knife-edge” example, since a perturbation of any of the four parameters eliminates the equality (across countries) of relative labor requirements in the two sectors.

Another source of CA (factor endowments) Heckscher-Ohlin-Samuelson (HOS) model

- Suppose that food and cloth both require capital and labor (K,L)
- Suppose cloth is more capital intensive than food (K/L ratio higher in cloth sector).
- Suppose that US aggregate capital/labor ratio is higher than Canada's
- Under a bunch of technical assumptions, US has *lower opportunity cost* = *comparative advantage* in cloth. Canada has CA in food.

A third source of comparative advantage

- Suppose that two countries are identical with respect to relative endowments and technology.
- Only difference is that one country has weak environmental laws.
- If food production is “relatively environment-intensive”, country with weak laws has an (apparent) CA in food production.

When do countries gain from trade?

- A country exports the commodity for which it has a CA.
- Absent market failures, both countries gain from trade.
- First two examples (differences in relative productivity or in relative factor endowments) lead to “standard” gains from trade.
- In third example (different environmental laws) a country might gain or lose from trade.

What determines whether country gains or loses from trade in third case?

- What is the reason for the “weak environmental laws” in one country?
- Are these the result of a market (or political) failure, or are the weak laws “socially efficient”?
- Problem with my example: I assumed otherwise identical countries, so hard to explain reason for difference in environmental laws.
- In the real world, these laws are “endogenous”.

A slightly more realistic example

- Suppose that two countries have “usual” differences (technology, relative factor endowments) in addition to differences in (e.g. environmental) laws or institutions.
- Two cases:
 - (i) Environmental laws set at socially optimal level in both countries:
 $MB(\text{pollution}) = MC(\text{pollution})$
 - (ii) These laws are too lax (e.g. because the government is corrupt or inefficient) in at least one country:
 $MB(\text{pollution}) < MC(\text{pollution})$

In this example there are several sources of CA

- Does trade improve welfare in both countries?
- In case (i), the answer is YES
- In case (ii), the answer is MAYBE
- Suppose we begin with trade restriction and too-lax environmental laws. Think of these as two “distortions”

Theory of the second best (TSB)

- TSB: If there are two (or more) distortions, correcting one distortion might either increase or decrease social welfare.
- In case (ii), there are 2 distortions. Removing (or reducing) the trade restriction has ambiguous welfare effects.
- In general, removing one distortion (trade restriction) might worsen the effect of the other distortion (weak environmental laws).

More on TSB

- In an economy “things are interconnected”.
- E.g. a subsidy on fertilizer affects food production, which (possibly) affects food prices and wages and income and demand for other goods, and their prices...and (possibly) the environment.
- Since “everything affects everything”, the (good and bad) consequences of policies are inter-related.
- A trade reform (e.g. liberalization) can alter the effect of environmental policy.