

The Pollution Haven Hypothesis (PHH)

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Three versions of the Pollution Haven Hypothesis (PHH)

- 1. At the margin, pollution control costs have some effect on investment decisions and trade flows. (Non-controversial)
- 2. Pollution control costs are important enough to measurably influence trade and investment. (A difficult empirical question.)
- 3. Countries set their environmental standards below socially efficient level in order to attract investment or to promote its exports. (A difficult empirical and conceptual issue.)
- #3 unlikely to be true unless #2 is also true.

Relevance of TSB when #3 is true

- Suppose that environmental laws are too weak and that trade liberalization leads to greater environmental damage.
- Trade liberalization might either increase or decrease welfare. (TSB)
- Liberalization promotes “standard” gains from trade (the benefit) but exacerbates environmental distortion (the cost).
- Are the benefits greater or less than costs? Remember that welfare costs tend to be proportional to “square of the distortion”. (See notes on “gains from trade, partial equilibrium.”)

Principle of Targeting (again)

- The economist's instinctive response to “second best” arguments for trade restrictions: Principle of Targeting. Trade policy is a poor policy tool for protecting the environment. Environmental policy is the proper tool.
- Environmentalist's instinctive response: We'll use any tool that is available.
- Both of these responses are too glib.

Reasons (other than PHH) for the relation between trade and pollution

- (a) Wealth differences cause environmental policy differences, leading to CA.
- (b) Different relative factor endowments associated with pollution and CA
- (c) FDI can cause changes in relative factor endowments, leading to production and trade effects (the “Rybczynski effect”).
- (d) Trade can promote growth which can affect the environment (the Environmental Kuznets’ Curve).
- (e) Technology transfer and the environment

Wealth and environmental policy

- Is “environmental quality” a luxury good? Are the rich willing to spend a larger share of budget on environmental quality?
- Nuemayer (pg. 44) cites survey evidence showing lack of correlation between expressed concern for environment and GNP. In other surveys poorer people express a higher “willingness to pay” (as share of income) for environmental quality, compared to rich.
- Regardless of level of concern, poor countries may be in a weaker position to pay for clean environment, because of competing needs.

(a) The environmental effects of trade driven by differences in wealth

- Two countries have same relative productivities, but one country richer (e.g. because of absolute advantage).
- Pollution standards set at socially optimal levels (*so no market imperfection*). Greater wealth leads to higher environmental standards. Poor country has CA in dirty industry.
- Trade causes production of pollution-intensive good to shift to poorer country with weaker (but optimal) environmental laws. Trade increases aggregate pollution, also increases welfare. (No distortions here.)

When trade is driven by differences in relative factor endowments

- These differences are a standard basis for CA. (HOS model)
- Suppose cloth is more capital intensive than food (K/L ratio higher in cloth sector).
- The country with higher K/L ratio tends to have CA in cloth. (Other considerations might also be important.)
- If the cloth sector is pollution-intensive, country with higher K/L ratio tends to have a CA in the dirty sector.

(b) Environmental effect of trade driven by differences in factor-endowments

- (i) North has stricter environmental standards. (ii) It is relatively well endowed with capital, and the capital intensive industry is also pollution intensive. ((i) and (ii) are offsetting effects.
- Capital effect (ii) dominates so North has CA in pollution intensive industry.
- When countries trade, production of pollution intensive good shifts to North.
- Since North uses cleaner methods, aggregate pollution declines.
- Welfare increases because of gains from trade. There are no market failures in this example.

The point of previous two examples

- There is no “theoretical” reason to assume that increased trade either increases or decreases levels of pollution.
- The relation between trade and pollution is an empirical, not a theoretical issue.
- Regardless of whether trade increases or decreases pollution, there are positive gains from trade (in the absence of offsetting distortions – the TSB.)

(c) The effect of *changes* in factor endowments

- “Rybczynski effect” (a theorem) Suppose that cloth is relatively capital intensive, compared to food. At constant prices, an increase in capital increases production of cloth and *decreases* production of food. (Illustrate graphically)
- If cloth is pollution-intensive, the increase in capital increases pollution.
- FDI can cause changes in relative factor endowments, leading to production, trade and environmental effects.

(d) Economic growth and the environment

- The “Environmental Kuznets’ Curve” (EKC): inverted U relation between income and environmental damage.
- Environmental damage depends on (i) scale, (ii) composition, and (iii) technique.
- (i) Higher output associated with more damage.
- (ii) Shift from agriculture to industry to services worsens and then improves environment. (Much too simple a description.)
- (iii) More modern industrial techniques tend to be less polluting.

Empirics and the EKC

- There is a huge literature on EKC, establishing inverted U-shaped relation between environmental variables and income. (Other variables included, e.g. measures of inequality, “openness to trade”).
- Recent studies challenge earlier EKC findings.
- The positive relation between “openness” and growth is widely accepted by economists, but empirical evidence is mixed.

(e) Globalization, technology transfer, and the environment

- Multinational firms (MNFs) “likely” to use modern, less polluting plants in foreign subsidiaries.
- It is cost-effective for them to use same technology in different countries, even where environmental laws are weaker.
- Reputation is important to MNFs.
- Empirical evidence show that more open countries likely to be early adopters of modern methods (e.g. steel production).

The main points, again

- There are lots of reasons why countries trade. Differing environmental laws may be important in some sectors, but probably have small aggregate impact.
- There are many ways in which trade and FDI can impact the environment. There is no theoretical presumption that a particular effect dominates.
- Absent other distortions, trade increases welfare, even if it harms the environment.
- In the presence of other distortions (e.g. excessively weak laws) the TSB kicks in.
- The presence of other distortions might increase the gains from trade, or make them negative. There is no presumption that other distortions decrease the gains from trade.
- The Principal of Targeting: trade policy is seldom an efficient way of achieving environmental objectives.

Just in case you thought that things were not sufficiently complicated...

- Here is one more example intended to convince you that strict environmental laws (e.g. high pollution taxes) do not necessarily decrease a country's comparative advantage in the "dirty good".
- Consider a two sector (HOS) model – the dirty good and the clean good – and two countries.
- The countries are identical except that Home has stricter environmental policy, a higher pollution tax, relative to Foreign.
- Does Foreign (the country with low environmental taxes) necessarily have the comparative advantage in the dirty good?

As with most economic questions...

- The answer is “It depends.”
- Here is a model in which Foreign does have CA in dirty good: Pollution abatement uses capital and labor in the same ratio as in production of the dirty good.
- In this case, part of the capital and labor in the dirty sector is diverted to abatement activities.
- The dirty sector in Home diverts a greater fraction of these factors to abatement, relative to Foreign (because of higher tax in Home).
- Home produces less dirty good per “bundle” of capital and labor, relative to Foreign. Foreign has CA in dirty good.

But here is a model that goes the other way

- Suppose that the dirty good is relatively labor intensive, and suppose that the abatement activity is more capital intensive than production of either the dirty or clean good (e.g. abatement uses only capital).
- A higher pollution tax encourages more abatement, and this draws more capital from the two sectors (dirty and clean).
- From Rybczynski theorem, the lower level of capital implies that production of dirty good increases, and production of clean good decreases.
- The Rybczynski effect can be strong enough to offset the higher costs in dirty sector (due to higher pollution tax). In that case, a higher pollution tax in Foreign gives Foreign the CA in the dirty good.

The point of this example

- Some relations that seem “obvious” may not be correct.
- It may seem “obvious” that if Home increases its environmental taxes (and Foreign does not), this change erodes any CA that Home might have in the dirty good.
- Although this relation might certainly be true, there are circumstances where it is not true.
- Don’t be so sure that you know how policies affect economic outcomes.