“Trade and Environmental Policy: A Race to the Bottom?”

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Trade and the environment

- Over past 15 years, heated debate over links between trade and environmental policy
  - What is the connection?
  - Why such controversy over the connection?
Links between trade and the environment

- If trade affects production and consumption, the latter creating *local* public bads, then trade can affect the environment.

- Production and consumption can generate *global* public bads which can be affected by both trade and trade policies.

- Trade policies may be used to enforce international environmental agreements, e.g., CITES, Montreal Protocol.
Why such controversy?

- Environmentalists claim benefits of freer trade outweighed by damage to environment
- In absence of trade policy, governments will harmonize down environmental standards
- Requires use of trade policies to countervail a race to the bottom and ecological dumping
Plan of presentation

- Overall focus is economics of a race to the bottom in environmental standards:
  - Traditional analysis of optimal policy
  - Pollution havens
  - Tariff substitution
  - Border tax adjustments

- Key conclusion: extension of existing GATT/WTO rules would minimize incentives for a race to the bottom
Traditional analysis of optimal policy

- First-best policy is to target environmental distortion at source

- Environmental policies can differ across countries in a first-best solution

- Nothing to support race to the bottom arguments *a priori* – even in large country case
Problems with traditional analysis

- Analysis rests on key assumptions of no retaliation, perfect competition, and immobile factors

- Tariff substitution effects, i.e., with freer trade, governments will weaken environmental policy as a substitute for trade policy

- With capital flight, FDI can be targeted at countries with weaker environmental policies, i.e., pollution haven effects
Pollution Havens

“Just between you and me, shouldn’t the World Bank be encouraging more migration of dirty industries to the less developed countries…” (Larry Summers, 1991, World Bank internal memo)

Key question: which countries attract dirty industries with freer trade?

Competing hypotheses: pollution havens vs. factor endowments (Copeland and Taylor, 2004)
Pollution havens vs. factor endowments

- Can be examined in a 2x2x2 Heckscher-Ohlin model

- Regions are North and South (*), goods are X (dirty/capital-intensive) and Y (clean/labor-intensive), and pollution polices are $\tau (\tau^*)$

- Assume identical regions except that $\tau > \tau^*$ - trade generates pollution haven in the South (Figure 1)

- Assume $K/L > K/L^*$, and $\tau = \tau^*$ - trade causes pollution to fall in South (Figure 2)

- Assume $K/L > K/L^*$, and $\tau > \tau^*$, trade pattern depends on which effect is stronger
Pollution havens vs. factor endowments

Figure 1: Pollution Haven

Figure 2: Factor Endowments
Pollution haven effects

- Theory suggests impact of environmental policies mitigated by other factors affecting trade, i.e., a *pollution haven effect*

- Support provided by empirical literature – evidence for trade and investment flows being affected by environmental policy and other factors

- If freer trade creates pollution haven effects, there is an incentive for a race to the bottom
Tariff substitution: imperfect competition

- Ecological dumping may occur with imperfect competition (Ulph, 1997)
- Suppose home and foreign firm compete in world market
- No domestic consumption, but local public bads
- Each government pre-commits to an emissions tax, and firms play Nash-Cournot
- Each government has incentive to relax policy (Figure 3) – but result is not very robust
Tariff substitution: imperfect competition

Figure 3: Ecological Dumping
Tariff substitution: terms of trade effects

- All large countries implement optimal tariffs in a terms-of-trade-driven Prisoner’s Dilemma (Johnson, 1953-54)

- GATT/WTO is solution to this via tariff bindings (Bagwell and Staiger, 1999)

- With environmental standards – is there a race to the bottom in such set-up?

- Only if GATT/WTO allows complete sovereignty over standards
Tariff substitution: terms of trade effects

- Assume 2 countries and 2 goods, there are local public bads, and each country can influence its terms of trade.

- Each country’s welfare is: $W(s, p, \tilde{p}^w)$

- Countries attempt to achieve efficient market access via tariff bindings – but a race to the bottom occurs (Figure 4).
Figure 4: Tariff Reductions and Market Access
Tariff substitution: race to the bottom

- Under GATT/WTO, countries do not have total sovereignty over environmental standards.

- If a country’s negotiated market access is reduced by standards, a *non-violation* complaint can be filed (GATT/WTO Article XXIII).

- This should prevent a race to the bottom.

- What if a country wants to raise its standards, allowing more market access, but its tariffs are bound?
Tariff substitution: regulatory chill

- Assume two-stage tariff negotiation game with given initial standards:
  
  (i) bound tariffs are negotiated
  (ii) unilateral change in policy mix, subject to bound tariffs and market access commitments

- If country’s preferred standard is lower, it can only reduce this by lowering its bound tariff because of the chance of a non-violation complaint (Figure 5a)

- If country’s preferred standard is higher, it can only raise it by increasing its bound tariff – which it cannot do under GATT/WTO rules (Figure 5b)
Figure 5: Tariffs and Non-Violation Complaints
Bagwell and Staiger (2001) suggest allowing renegotiation of bound tariffs to avoid regulatory chill.

Basic principle already allowed through border tax adjustments for environmental excise taxes (GATT/WTO Articles III and XVI).

Rules extended to case of environmental taxes imposed on intermediate goods where domestic final good competes with an imported final good (Davie, 1995), e.g., CFC taxes in US.
Border tax adjustments/environmental taxes

- Poterba and Rotemberg (1995) examine case of perfect competition at intermediate and final goods stages

- Import tax on final good equal to environmental tax times extent to which intermediate good enters final good cost function is neutral in terms of maintaining market access

- McCorriston and Sheldon (2005) show result is sensitive to assumption of perfect competition
Border tax adjustments/environmental taxes

- Use model of successive oligopoly with one-to-one fixed proportions technology

- Three-stage game:
  (i) Government commits to environmental tax and border tax
  (ii)/(iii) Nash equilibria upstream and downstream

- Final goods *strategic substitutes* or *complements*
Border tax adjustments/environmental taxes

- Maintained market access not defined explicitly in GATT/WTO rules - two possible rules:

  - **Import-volume neutrality**

    Type and size of border tax adjustment depends on:
    - nature of competition
    - incidence of upstream environmental taxes on downstream firm’s cost function

    Domestic firm’s rents fall, those of foreign firm rise (Figure 6)
Figure 6: Import Volume Neutrality
Border tax adjustments/environmental taxes

- *Import-share* neutrality

Size of border tax adjustment depends on nature of competition

Rents of both domestic and foreign firm increase (Figure 7)

- While objective is to set border taxes so as not to be unwittingly protectionist, there are rent-shifting effects that affect way firms will lobby for policy
Border tax adjustments/environmental taxes

Figure 7: Import Share Neutrality
A race to the bottom?

- Not under standard analysis of optimal policy
- Assumes no retaliation, perfect competition, and mobile factors
- Evidence supports pollution haven effects
- Ecological dumping not robust, but regulatory chill/race to the bottom may occur under terms of trade arguments
- Solution to latter may lie in existing GATT/WTO rules – non-violation complaints and border tax adjustments