

# LECTURE 10: INTERNATIONAL COMPETITION

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14.42/14.420

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# Part II of semester

- Will give you readings, and sometimes questions, in advance
- Schedule:
  - International competition (today)
  - Environment, growth, and development (Thursday and next week)
  - Measuring benefits
  - Non-renewable resources
  - Policy application: Climate change
  - Policy application: Energy efficiency
  - Final exam

# Today's Agenda

- International and Inter-Regional Competition
  - Free trade and the environment
    - Intro
    - Countervailing tariffs
    - More on this next time
  - Pollution Havens
  - International Environmental Agreements

# Free Trade and the Environment:

- Anti-WTO Protests in Seattle, 1999



Photo courtesy of isafrancesca on [Flickr](#).

# WTO Shrimp-Turtle Case

- US Endangered Species Act (1973) listed sea turtles as endangered
- Required Turtle Excluder Devices (TEDs).
  - Cost: \$20-\$35 each
- 1989: US bans import of shrimp and shrimp products harvested with a more harmful process
  - Worry: Leakage



Photo courtesy of spinnerin on [Flickr](#).

# WTO Shrimp-Turtle Case

- 1997: India, Malaysia, Pakistan, and Thailand filed a WTO complaint against US
- WTO ruling: Countries can pass environmental laws
- But must be non-discriminatory
  - US had provided extensions and technical assistance to Caribbean countries
  - Did not provide advantages to the claimants
- Process vs. Product



Photo courtesy of spinnerin on [Flickr](#).



# WTO Protests



- Were the protesters right?

Photo courtesy of dbjones on [Flickr](#).

# Countervailing Tariffs

- Setup:
- Two countries: Producer and importer
  - Production involves damages (pollution) which impose a negative externality on the importer country
  - Both countries consume the goods.
- Importer imposes a tariff on all shrimp production
- Is this efficient? What are the effects?



# Pollution Havens

- Pollution Haven Effect: Tightening of environmental regulation affects plant location decisions and trade flows
  - Will discuss today
- Pollution Haven Hypothesis: Reduction in trade barriers will cause pollution-intensive industries to move to countries with weaker regulation.
  - More next time

# Pollution Haven Effect

- Traditional Empirical test:
- $Y_{ij} = \alpha_i K_{ij} + \beta_i L_{ij} + \gamma_i H_{ij} + \delta R_j + u_{ij}$ 
  - $Y$  = Output in sector  $I$  from country  $j$ 
    - Or exports, or international capital flows to the industry
  - $K, L, H$  = capital, low-skilled labor, high-skilled labor endowments
  - $R$  = Strictness of environmental regulation
- Early evidence was weak that regulation affects output or capital flows. Why?

# Pollution Haven Effect: Additional Evidence

- Traditional Empirical test:
  - $Y_{ij} = \alpha_i K_{ij} + \beta_i L_{ij} + \gamma_i H_{ij} + \delta_i R_{ij} + u_{ij}$ 
    - $Y$  = Output in sector  $I$  from country  $j$ 
      - Or exports, or international capital flows to the industry
    - $K, L, H$  = capital, low-skilled labor, high-skilled labor endowments
    - $R$  = Strictness of environmental regulation
- New empirical test:
  - $Y_{ijt} = \delta_i R_{ijt} + \mu_{ij} + v_t + u_{ij}$
  - $v$  = time controls
  - $\mu$  = controls for industry by county
- Look over time within a jurisdiction, using variation in environmental regulation.
  - Addresses omitted variables bias
  - But need large variation in environmental rules over space and time

# Greenstone (2002)

- *The Impacts of Environmental Regulations on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures*
- CAAA70, 77, 90 established attainment and non-attainment areas for CO, ozone, SO<sub>2</sub>, and TSPs.
- US Census of Manufactures captures employment, investment, and output in 1967, 72, 77, 82, and 87.
- Results: Non-attainment counties lost 590,000 jobs, \$37 billion in capital stock, and \$75 billion of output.
  - These seem large but are still small relative to the total size of manufacturing.

# Takeaways

- Per Greenstone (2002) and others, environmental regulations do appear to have costs: industry closes or moves, and jobs are lost
- Should the regulator weaken regulations in response?

# International Environmental Agreements

- Montreal Protocol (1987)
  - Chlorofluorocarbons (CFCs) used as refrigerants were depleting the ozone layer.
  - Montreal Protocol required their phase-out by 1996 for CFCs
    - Later for HFCs and HCFCs.
  - Perhaps the most successful international environmental agreement
- Differences between Montreal and Kyoto
  - Benefit/cost ratio better (?)
  - Industrialized countries pay for poor countries
    - Multilateral Fund for Implementation: \$2.1 billion from 1991-2005.
  - Violators punished
  - What else?



# Size of IEAs

- Emission Abatement Game
  - Each country decides whether to abate or not.
  - $\pi_i = e_i - \gamma[\sum_j e_j]$
  - Five players,  $\gamma = 0.4$
- International Environmental Agreement Game
  - Stage 1: Each country decides whether to “participate” in the agreement or not.
  - Stage 2: “Participating” countries choose the cooperative abatement solution

# Today's Class

- International Competition:
  - Countervailing tariffs
  - Pollution Haven Effect
  - International Environmental Agreements

# Readings

- Today:
  - Kolstad Chapter 19
- Today/Thursday:
  - Copeland and Taylor (2004)
- Thursday: Environmental Kuznets Curves
  - Kolstad Chapter 20 Part I.
  - Grossman and Krueger (1996)
  - Think about:
    1. Through what channels does the EKC act? What are most powerful?
    2. Do you believe the empirical work?
- Tuesday: Porter Hypothesis
  - Kolstad Chapter 20 Part II
  - Porter and van der Linde (1995), Palmer, Oates, and Portney (1995)
- At least understand the introductions to these articles and their main concepts. Do not wallow in the math and models unless you want.

# Midterm Results

- Reasonably good work on midterm
- Results:
  - Mean:  $68/109 = 63\%$
  - 90<sup>th</sup> Pctile: 102
  - 20<sup>th</sup> Pctile: 56
  - Quant harder than short answer for people:
    - Quant Average: 52%
    - Short Answer Average: 73%
- What I learned from the midterm:
  - Am going to focus on clear exposition of the basic models.
    - Will extend the models, but only to reinforce understanding of the basic model.

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