

# Trade and the Environment

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## Some Facts

- Poor Environmental Quality in many less developed countries
- Continuing deforestation; capture fisheries are in a state of decline if not collapse.
- Carbon emissions continue to grow at rapid rates

## The Case Against Free Trade

- Poor environmental outcomes; weak if any Environmental Regulations.
- Trends are towards specialization in Environmentally sensitive goods
- Movement to liberalized trade

## The Pollution Haven Hypothesis

- Differences in the costs of meeting regulations are the most important motivation for trade in dirty goods.
- Income levels are key determinants of environmental standards
- World income distribution is highly skewed.

## Free International Trade Causes:

- Dirty industries to move and create pollution havens in Poor countries
- Pollution in Poor countries to rise; Pollution in Rich countries to fall
- World pollution levels to rise.

## In Resource Industries

- Property rights over resources are hard to define and difficult to enforce
- Property rights are often weak in developing countries.
- Resource depletion and deforestation accelerate with liberalized trade

## In Developed Countries

- Job losses in pollution intensive industries.
- Regulatory chill
- Perhaps some improvement in environmental quality
- Consumers gain from cheaper products produced in countries with lax regulation.

## Pollution Haven Hypothesis Summary

## Plausible, but ..

- Weak regulation today does not mean weak regulation tomorrow.
- Is there evidence environmental regulation matters a lot to production costs or location decisions.
- What if weak regulation is correlated with other country characteristics that may make production unattractive.

## The Case for Free Trade

- Step One. Agree that:
- Regulations are weak or non-existent in developing countries
- Patterns of specialization moving towards pollution intensive goods
- There are many serious environmental problems in the world today.

## Step Two: Introduce a Common Language

- Scale, Composition & Technique

$$E = \sum_{i=1}^n a_i s_i Y$$

$$\sum_{i=1}^n s_i = 1$$

## Trade's Impact

$$\hat{E} = \sum_{i=1}^n \pi_i [\hat{a}_i + \hat{s}_i] + \hat{Y} \quad \pi_i = E_i / E$$

$$\text{Technique Effect} = \hat{a}_i < 0$$

$$\text{Composition Effect} = \hat{s}_i$$

$$\text{Scale Effect} = \hat{Y} > 0$$

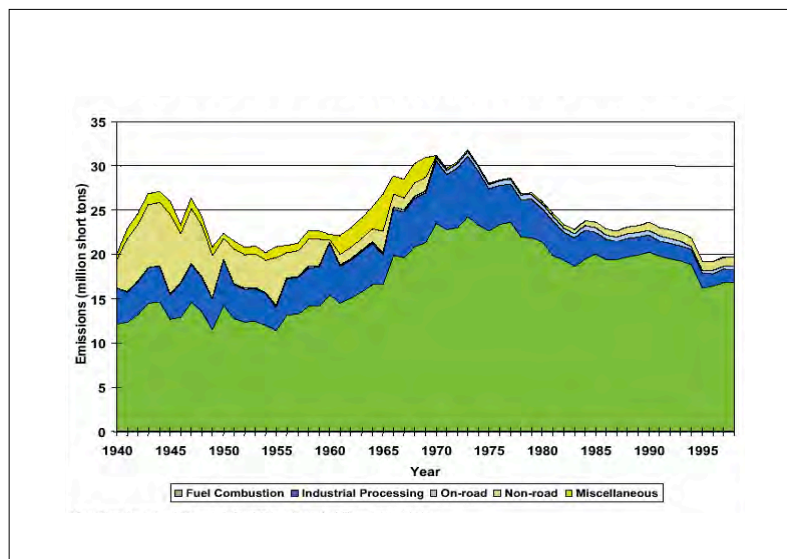
## Step Three: Consider the Evidence

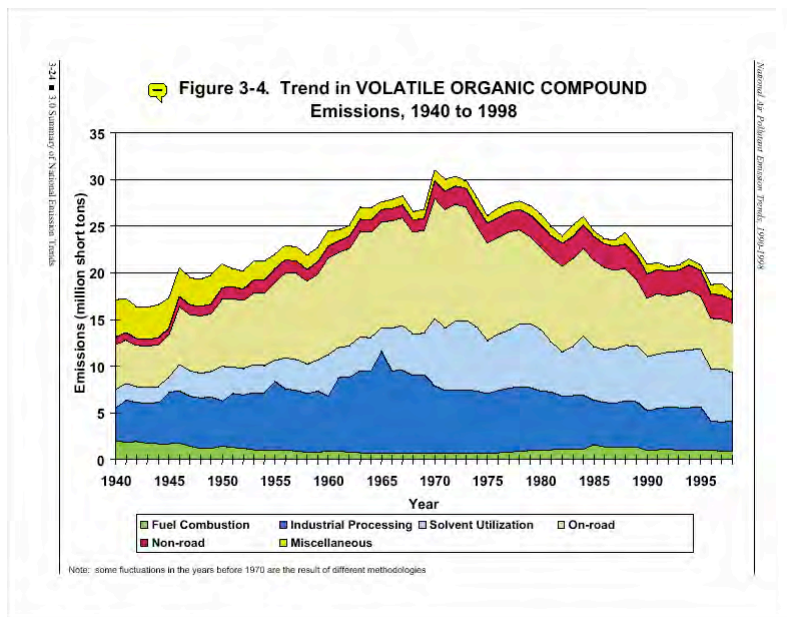
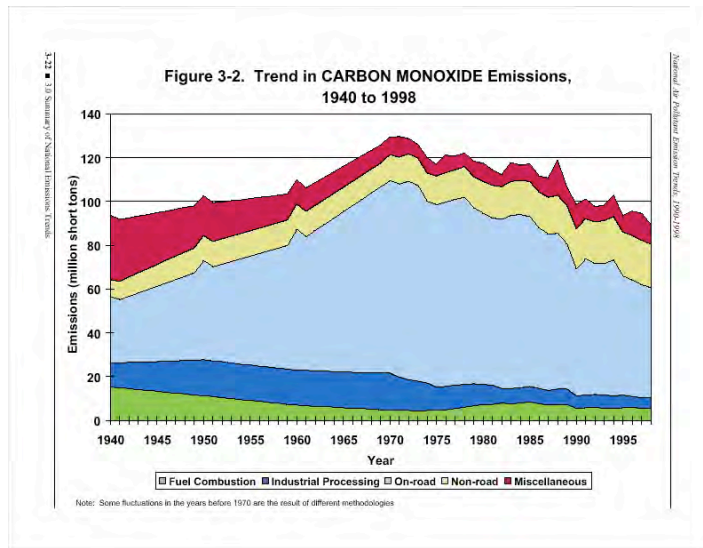
### Regulation is flexible

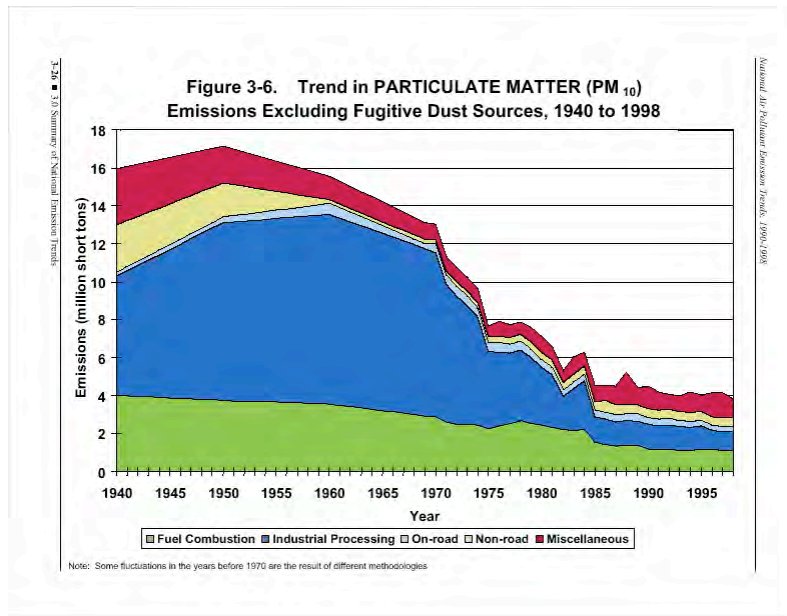
- Grossman & Krueger: The Environmental Kuznets Curve
- Hilton and Levinson: Lead content of Gasoline.
- Dasgupta, et al. Informal Regulation in less developed countries

## Exhibit A

- The Environmental Kuznets Curve
- Many pollutants at first rise with development and then fall
- This holds for many pollutants, different countries, and time periods







## EKC Summary

- Scale dominated by Technique
- Composition effects small
- Technique effect: policy and tech progress.

Pollution control Regulation  
matters but may not matter most

### Empirical work Pre-1995

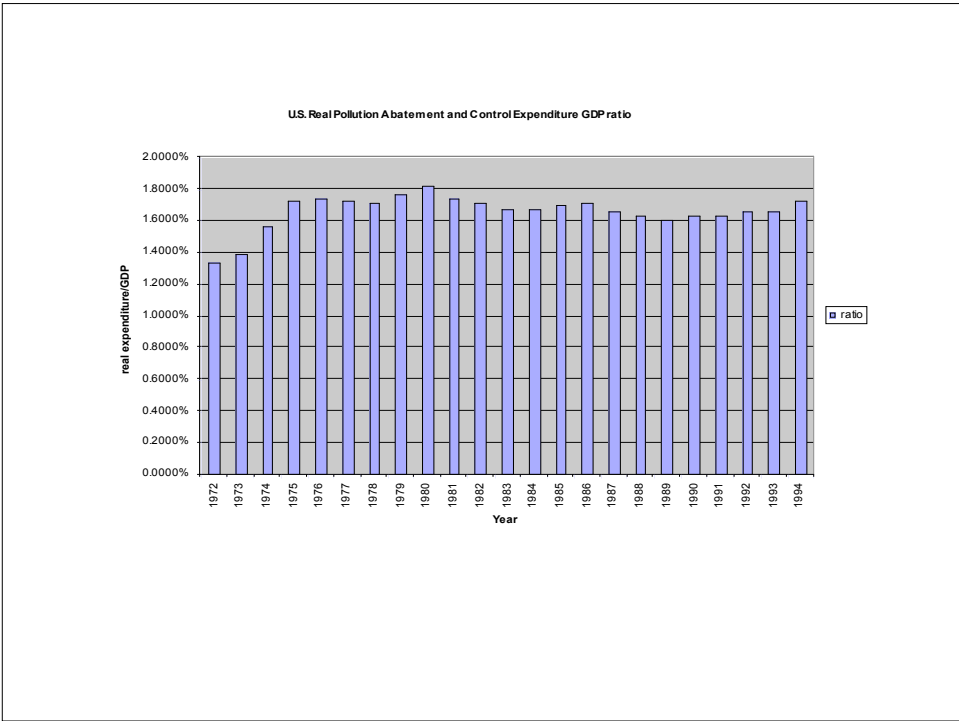
- Differences in environmental policy have little or no effect on trade patterns, investment flows or firm location
- No support therefore for pollution haven hypothesis
- No need to worry about competitiveness consequences

## Empirical work Post-1995

- Account for the endogeneity of regulation.
- Find significant effects of regulation on trade flows and plant location.
- Levinson (1999); Levinson and Taylor (2001); Ederington and Minier (2003); Becker and Henderson (2000); Kahn (1997); Greenstone (2002); List et al. (2002); Keller and Levinson (2002); List and Millimet (2004).

## Exhibit B

- Pollution Abatement costs have been rising, but as a fraction of US Real Output they are virtually constant.
- Costs as a fraction of Manufacturing Value-added are small.



## Correlated Characteristics

## Is Free Trade good for the Environment?

- Introduces an Alternative Hypothesis
- Direction of trade is determined by conventional determinants of comparative advantage – factor endowments and technology.
- Use SO<sub>2</sub> data on pollution concentrations in 108 cities (43 countries) around the world over the 1976-1996 period.

## Implications of the Theory

- Liberalized trade could shift pollution intensive production from poor to rich countries
- This shift would move production to tighter regulation countries
- Liberalized trade could lower world pollution and improve environmental quality in both poor and rich countries.

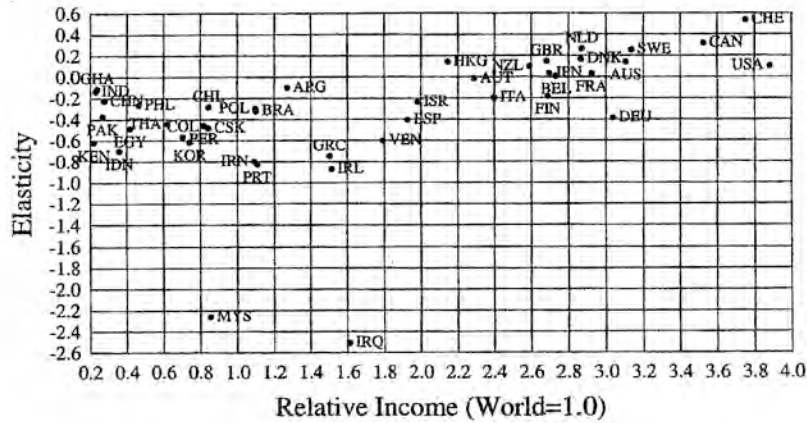
## Empirical Results

- Scale effect: 1% increase in Scale of economic activity, increases pollution by .25-.5%
- Technique effect: 1% increase in income/capita reduces pollution concentrations by 1.25-1.5%

## Composition effect of Trade?

- Effects of trade on pollution are statistically significant, but rather small
- Composition effect positive for some countries, negative for others (as theory would predict)
- Factor endowment effects are stronger than pollution haven motives

## Exhibit C

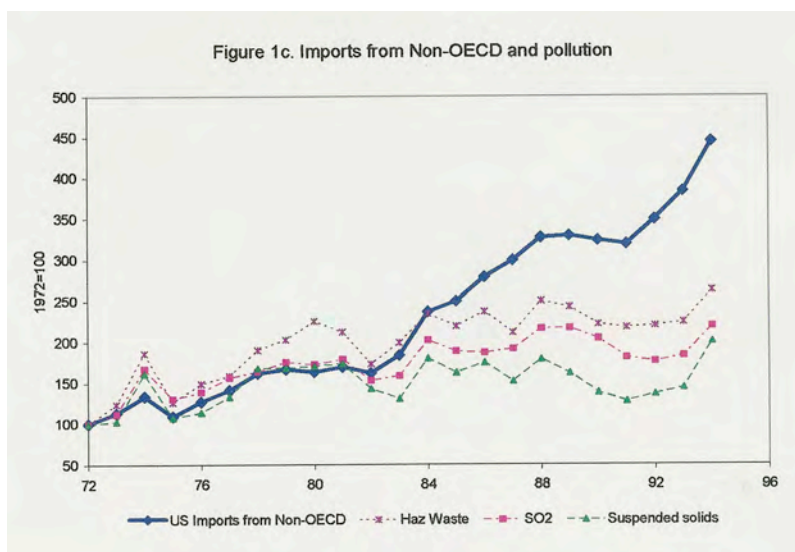


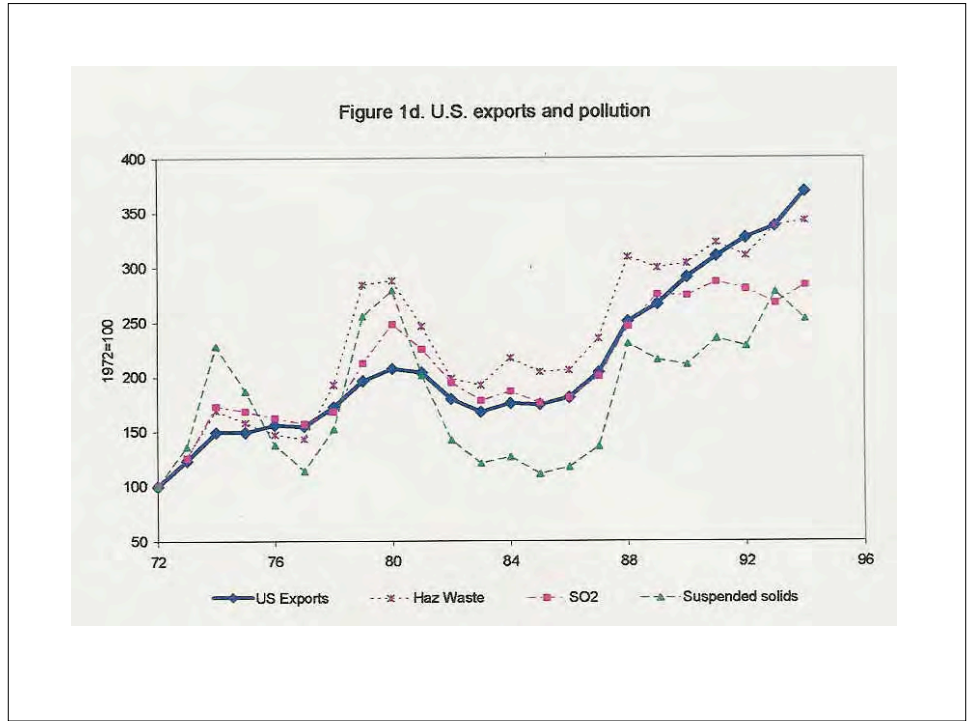
## Implications

- Impact of different regulations can be swamped by other determinants of costs
- If so, trade shifts dirty good production from poor to rich countries
- Shifts production to tighter regulation countries
- Trade leads to a decrease in world pollution

## Could it be true?

- Bohn and Deacon: property rights and resource use
- Frankel and Rose: no evidence of trade harming environment
- Ederington and Levinson: US specific Evidence





## Conclusions

- Pollution Haven Hypothesis is logically tight, but may be empirically irrelevant.
- Flexibility of Regulation
- Magnitude of pollution abatement costs
- Correlated characteristics.

## Three Caveats

- Very little if any convincing evidence on resource use and liberalized trade.
- Tests of trade's impact on the environment are crude and need improvement.
- Good cross country data on the environment is very rare.