Addressing Leakage & Competitiveness in Climate Change Policy Proposals

Jeffrey A. Frankel

Harpel Professor, Harvard Kennedy School

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Introduction:
Trade & the Environment

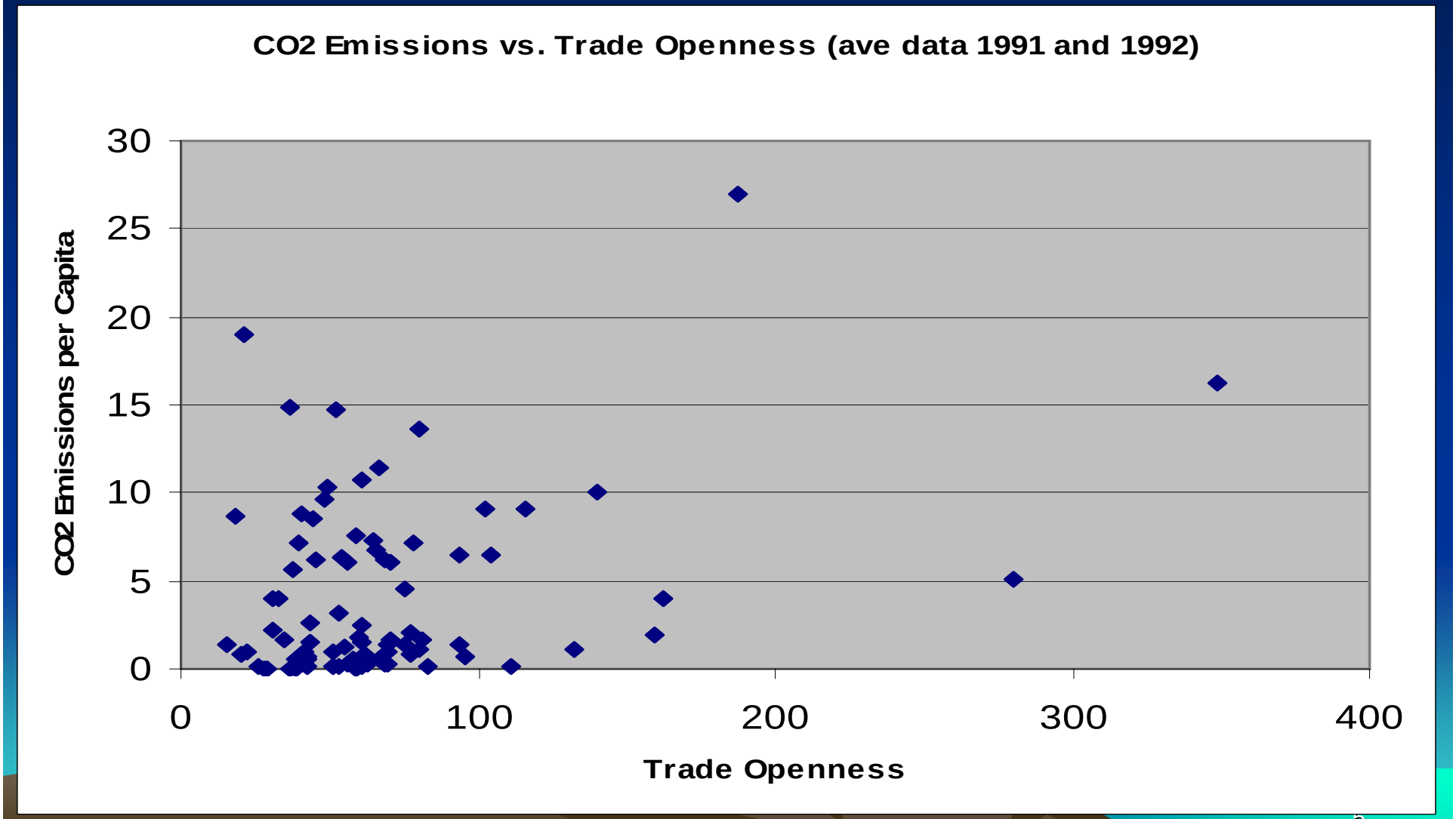
Is trade itself good or bad for the environment, in theory?

Environmental effects of trade	**via growth in income:**	**for a given level of income** :
	Environmental K.Curve	
Harmful effects 	larger scale of economic activity	"Race to the bottom" in national regulation
Beneficial effects 	shifts to cleaner techniques and composition of economic activity	"Gains from trade": ratcheting up standards, consumer power, innovation.

Which tend to dominate in practice?

- The effects of trade that are detrimental to the environment (e.g., race to the bottom)?
- Or the effects of trade that are beneficial (e.g., imports of fuel-efficient autos)?
- It depends on what measure of environmental quality is at stake.

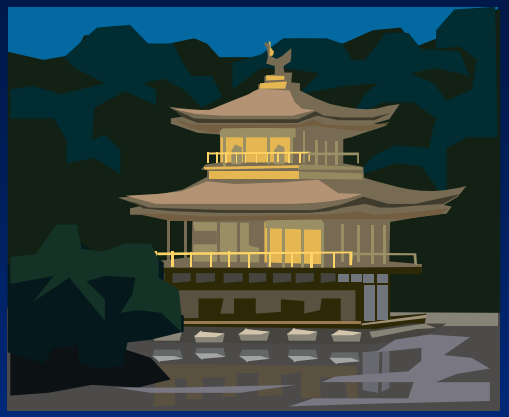
CO_2 emissions/capita are positively correlated with trade



Is trade itself good or bad for the environment, statistically?

See Addendum 1: Regression results, Frankel & Rose (2005).

Environmental effects of trade (1990)	**via growth in income:**	**for a given level of income:**
for SO_2 concentrations	EKC: after an income of about $5,700/cap., further growth tends to reduce pollution (via national regulation)	The favorable effects of trade seem to dominate. ***=> Good***
for CO_2 emissions / capita	No sign that total emissions ever turn down. (CO_2 is a global externality; little regulation is possible at the national level)	Trade may also increase emissions even for a given level of income. ***=> Bad***



Kyoto & Geneva

Will Global Climate Change Policies Come Into Conflict with Global Trade Policies?

Possible application of trade barriers by US:

- Of **12 Market-Based Climate Change Bills** introduced in the 110th Congress, almost half called for some border adjustment:
  - tax applied to fossil fuel imports or
  - permit requirement for energy-intensive imports.

- **Energy Independence & Security Act 2007** (Section 526) "limits US government procurement of alternative fuel to those from which the lifecycle greenhouse gas emissions are equal to or less than those from conventional fuel from conventional petroleum sources." Canada's oil sands vulnerable.

Congressional legislation

- Bingaman-Specter bill: “If other countries are deemed to be making inadequate efforts [in reducing global GHG emissions], starting in 2020 the President could require importers from such countries to submit special emission allowances (from a separate reserve pool) to cover the carbon content of certain products.”
- Similarly the Lieberman-Warner bill has the president determine what countries have taken comparable action to limit GHG emissions. For imports of covered goods from covered countries, starting in 2020, importers must buy international reserve allowances.

Washington may not realize that the US is likely to be the victim of legal sanctions before it is the wielder of them.

- In Europe, firms have already entered the 1st Kyoto budget period of binding emission limits, competitiveness concerns are well-advanced, and the non-participating US is a target of resentment.
- After the US failed to ratify, EU parliamentarians proposed a "Kyoto carbon tax" against US imports.
- The EU Commission had to make a decision on the issue in Jan. 2008, when the EU determined its emission targets for the post-Kyoto period.

French President Sarkozy warned:

- "…if large economies of the world do not engage in binding commitments to reduce emissions, European industry will have incentives to relocate to such countries…The introduction of a parallel mechanism for border compensation against imports from countries that refuse to commit to binding reductions therefore appears essential,
  - whether in the form of a tax adjustment or
  - an obligation to buy permits by importers.

- This mechanism is in any case necessary in order to induce those countries to agree on such a commitment."

letter to Manuel Barroso, Jan. 2008

Possible application of trade barriers by EU:

Directive of the European Parliament
& of the Council, Paragraph 13,
amending Directive 2003/87/EC so as to improve and extend
the EU greenhouse gas emissions allowance trading system; Brussels, Jan. 2008:

- "Energy-intensive industries which are determined to be exposed to significant risk of carbon leakage could receive a higher amount of free allocation, or
- an effective carbon equalization system could be introduced with a view to putting EU and non-EU producers on a comparable footing. Such a system could apply to importers of goods requirements similar to those applicable to installations within the EU, by requiring the surrender of allowances."

Would trade controls or sanctions be compatible with the WTO?

Question (1):

GHG emissions are generated by so-called Processes and Production Methods (PPMs). Does that rule out trade measures against them?

Question (2):

What specifics of trade control design are appropriate?

What about PPMs?

Can measures be directed against CO_2 emissions in other countries, as embodied in electricity, or in goods produced with it?

- Under the GATT, countries could use import barriers to protect themselves against environmental damage that would otherwise occur within their own borders, but not to affect how goods are produced in foreign countries, PPMs.
- A notorious example: the GATT ruling against US barriers to imports of tuna from dolphin-unfriendly Mexican fishermen.
- But things have changed

Mutual respect

- The WTO & the Kyoto Protocol came into existence at roughly the same time.
- The drafters showed more consideration for each other than the rank & file of environmentalists and free traders.
- The Kyoto Protocol text:
  - Parties should “strive to implement policies and measures...to minimize adverse effects..on international trade...” ;
  - FCCC features similar language

Mutual respect, continued

- WTO regime is equally solicitous of the environment:
  - Article XX allows exceptions for health & conservation
  - Preamble to 1995 Marakesh Agreement establishing WTO seeks “to protect and preserve the environment;”
  - 2001 Doha Communique starting new round of negotiations: “the aims of ... open and non-discriminatory trading system, and acting for the protection of the environment ... must be mutually supportive.”.

PPMs now appear acceptable.

Two important precedents:

(1) Montreal Protocol

(2) Shrimp-turtle case

Precedent (1): Montreal Protocol on stratospheric ozone depletion

- Trade controls had two motivations:
  - (1) to encourage countries to join, and
  - (2) if major countries had remained outside, would have minimized leakage, the migration of production of banned substances to nonparticipating countries
  - In the event (1) worked, so (2) not needed
- No reason why Kyoto Protocol could not also have included trade sanctions.

Precedent (2): The true meaning of the 1998 WTO panel shrimp-turtle decision

- New ruling: environmental measures can target, not only exported products (Article XX), but also partners' Processes & Production Methods (PPMs),
- subject, as always, to non-discrimination (Articles I & III).
- US was able to proceed to protect turtles, without discrimination against Asian fishermen.
- Environmentalists failed to notice or consolidate the PPM precedent.

In case there is any doubt that Article XX, which uses the phrase "health and conservation," applies to climate change, …

- A 3rd precedent is relevant:
- In 2007, a new WTO Appellate Body decision regarding Brazilian restrictions on imports of retreaded tires confirmed the applicability of Article XX(b):
- Rulings "accord considerable flexibility to WTO Member governments when they take trade-restrictive measures to protect life or health… [and] apply equally to … measures taken to combat global warming."

These examples go a long way to establishing the legitimacy of trade measures against PPMs.

- Many trade experts are not yet convinced [1], let alone poor countries.
- I have come to believe the Kyoto Protocol could follow the Montreal Protocol by incorporating well-designed trade controls aimed at non-participants.
- One aspect that strengthens the applicability of the precedent is that we are not talking about targeting practices in other countries that harm solely the local environment, where the country can make the case that this is nobody else's business.
  - Depletion of stratospheric ozone depletion is a *global* externality.
  - So is endangerment of sea turtles.
  - So is climate change from GHG emissions.

[1] Some experts believe that even multilateral trade penalties against non-members might not be permissible under the WTO. Sampson (2000, p.87).

Principles for design of legitimate penalties on carbon-intensive imports. #1

- **The existence of a multilaterally negotiated international treaty, the Kyoto Protocol, conditions the legitimacy of trade controls:**
  - **On the one hand, the case for controls is stronger because leakage to non-members could negate the KP's goal. It is stronger, e.g., than in shrimp-turtle (a unilateral US measure).**
  - **On the other hand, the case is weaker than it was for the Montreal Protocol: Kyoto could have allowed explicitly for multilateral trade controls, and chose not to.**
  - **The case would be especially weak for American measures if the US has still not ratified the KP or a successor agreement.**
  - **The EU has a relatively good case against the United States, until such time as the US ratifies.**

Principles for design of legitimate penalties on carbon-intensive imports. #2

- **What goods or services are to be made subject to penalty?**
  - **It would certainly be legitimate to apply tariffs against coal itself, assuming domestic taxation of coal or a domestic system of tradable permits were in place.**
  - **Probably also legitimate applied to electricity by carbon content.**
  - **The big question: manufactures.**
  - **Trade sanctions probably not legitimate when applied solely as punishment for free riding, against unrelated products of a non-member**
  - **Paradoxically, the need to keep out coal-generated electricity or aluminum from non-members of the Kyoto Protocol is greater than the need to keep out coal itself. The reason: the KP already puts limits on within-country emissions.**

Principles for design of legitimate penalties on carbon-intensive imports. #3

- **It is hard to determine carbon content of manufactures.**
  - **Better to stay with the 6 biggest-scale, most energy-intensive industries – including aluminum, cement, steel, paper, & glass.**
  - **Even here there are difficult questions.**
    - **What if the energy used to smelt aluminum in another country is cleaner (Iceland) than in the importing country or dirtier (China)?**
    - **How can one distinguish the marginal carbon content of energy used for a particular aluminum shipment from the average carbon content of energy in the country of origin?**
    - **These are questions that will have to be worked out.**
  - **As soon as one goes beyond 6 big industries, it becomes too difficult for even a good-faith investigator to discern effective carbon content; also too vulnerable to capture by special interests.**

The big danger

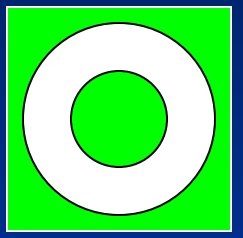
- If each country imposes border measures in whatever way suits national politics, they will be poorly targeted, discriminatory, and often disguisedly protectionist.
- Thus they will indeed run afoul of the WTO, and deserve to.
- We need a multilateral regime to guide such measures.

Concluding recommendations

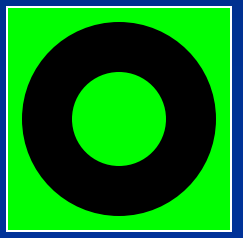
- Central message: border measures to address leakage need not necessarily violate sensible trade principles or the WTO,
  but there is a great danger that they will in practice.
- I conclude with some subjective judgments as to principles that could guide a country drawing up border measures, if its goal were indeed to reduce leakage and avoid artificially tilting the playing field toward carbon-intensive imports of non-participating countries.

I classify characteristics of possible border measures into 3 categories, named by color:

(1) “White” category: those that seem reasonable & appropriate.

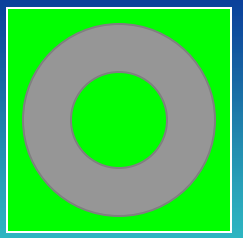


(2) “Black” category: those that seem dangerous, in that they are likely to become an excuse for protectionism.

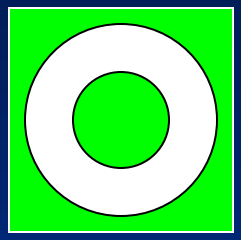


(3) “Grey” category:

those that fall in between.

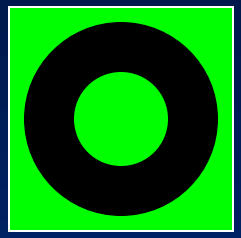


The White (appropriate) border measures could be tariffs or, equivalently, a requirement for importers to surrender tradable permits.



The principles include:

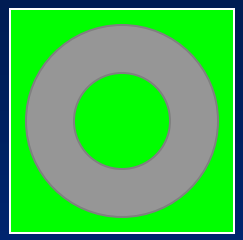
- Measures should follow guidelines multilaterally-agreed among countries participating in the targets of the KP and/or its successors.
- Judgments as to findings of fact -- what countries are not complying, what industries, what carbon content, what countries are entitled to respond, or the nature of the response -- should be made by independent expert panels.
- Measures should only be applied by countries cutting their own emissions in line with the KP and/or its successors, against countries that are not doing so due either to refusal to join or to failure to comply.
- Import penalties should target fossil fuels, and a half dozen or so of the most energy-intensive major industries:
  aluminum, cement, steel, paper, glass, and perhaps iron & chemicals.



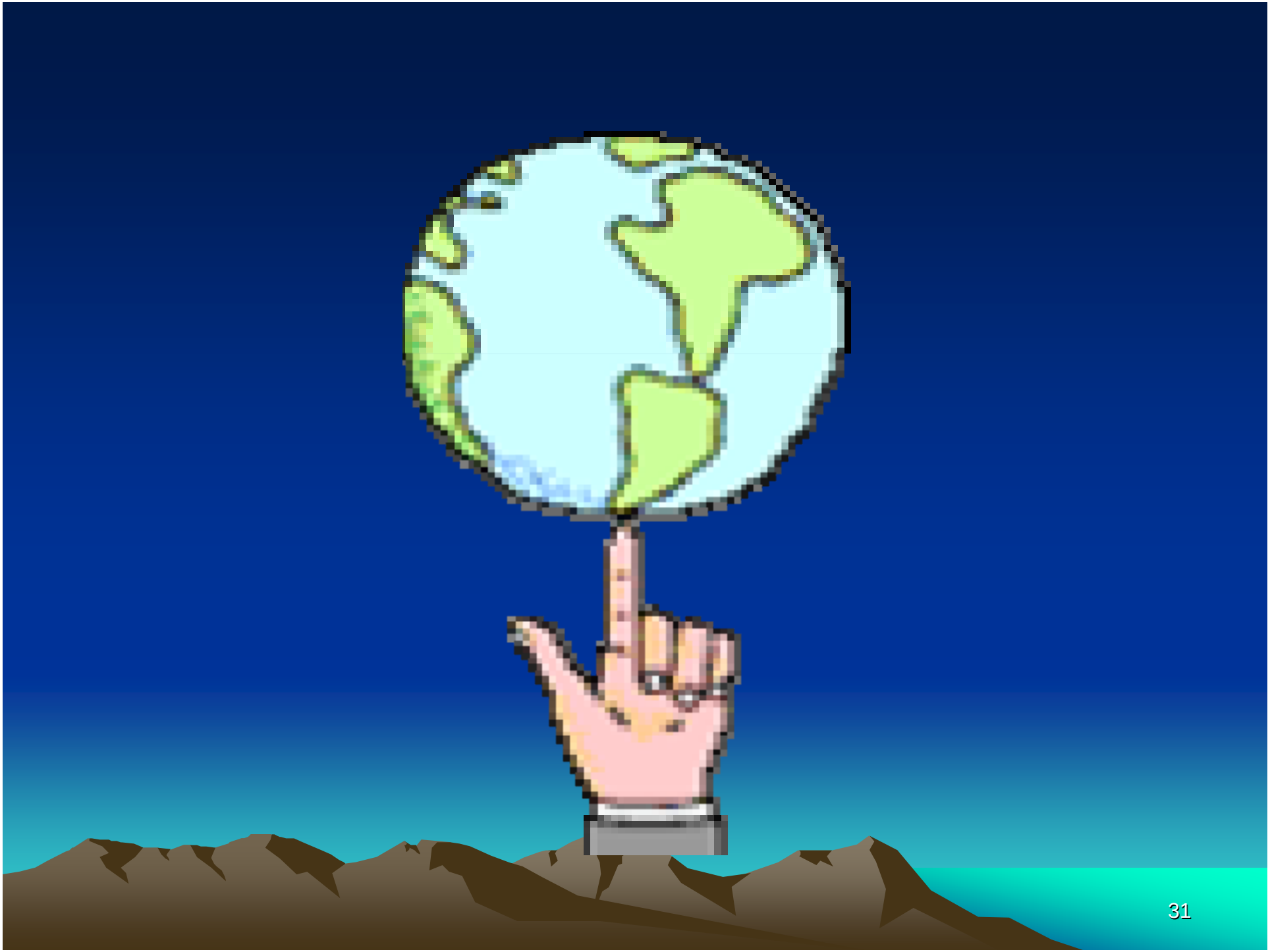
Black (inappropriate) border measures include:

- Unilateral measures applied by countries that are not participating in the Kyoto Protocol or its successors.
- Judgments as to findings of fact made by politicians, vulnerable to pressure from interest groups for protection.
- Unilateral measures to sanction an entire country.
- Import barriers against products that are removed from the carbon-intensive activity, such as firms that use inputs that are produced in an energy-intensive process.
- Subsidies -- whether in the form of money or extra permit allocations -- to domestic sectors that are considered to have been put at a competitive disadvantage.

The Gray (intermediate) measures include:



- Unilateral measures that are applied in the interim before there has been time for multilateral negotiation over a set of guidelines for border measures.



Addenda

I. Is trade good or bad for the environment?

II. Econometric estimation of environmental effects of trade, recognizing endogeneity

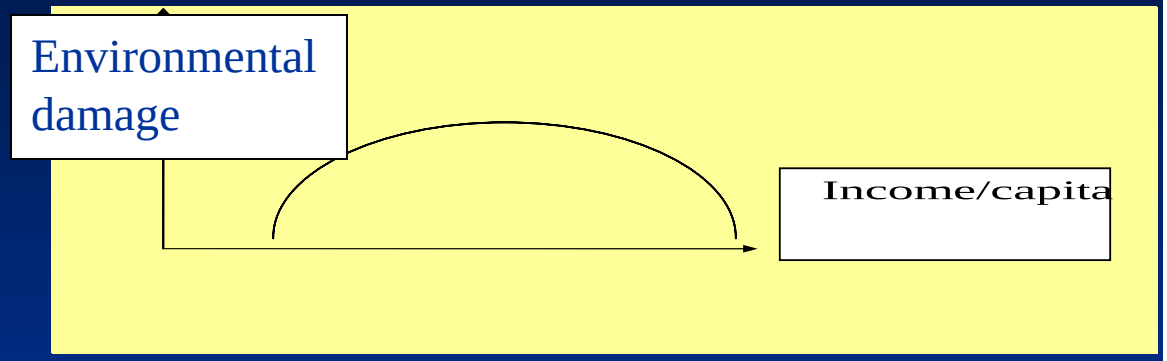
III. The Anti-Globalization movement

IV. Areas of potential Kyoto-WTO conflict *other than* carbon import barriers.

Addendum I. Is trade itself good or bad for the environment?

- Many possible effects of trade.
- They can be categorized according
  - to whether they operate
    - via GDP, just like investment, technology, and other sources of economic growth,
    - or whether they are peculiar to trade alone, and hold for a given level of GDP.
  - Within each category, there are effects both
    - beneficial for the environment,
    - and detrimental.

Is growth *per se* good or bad for the environment?



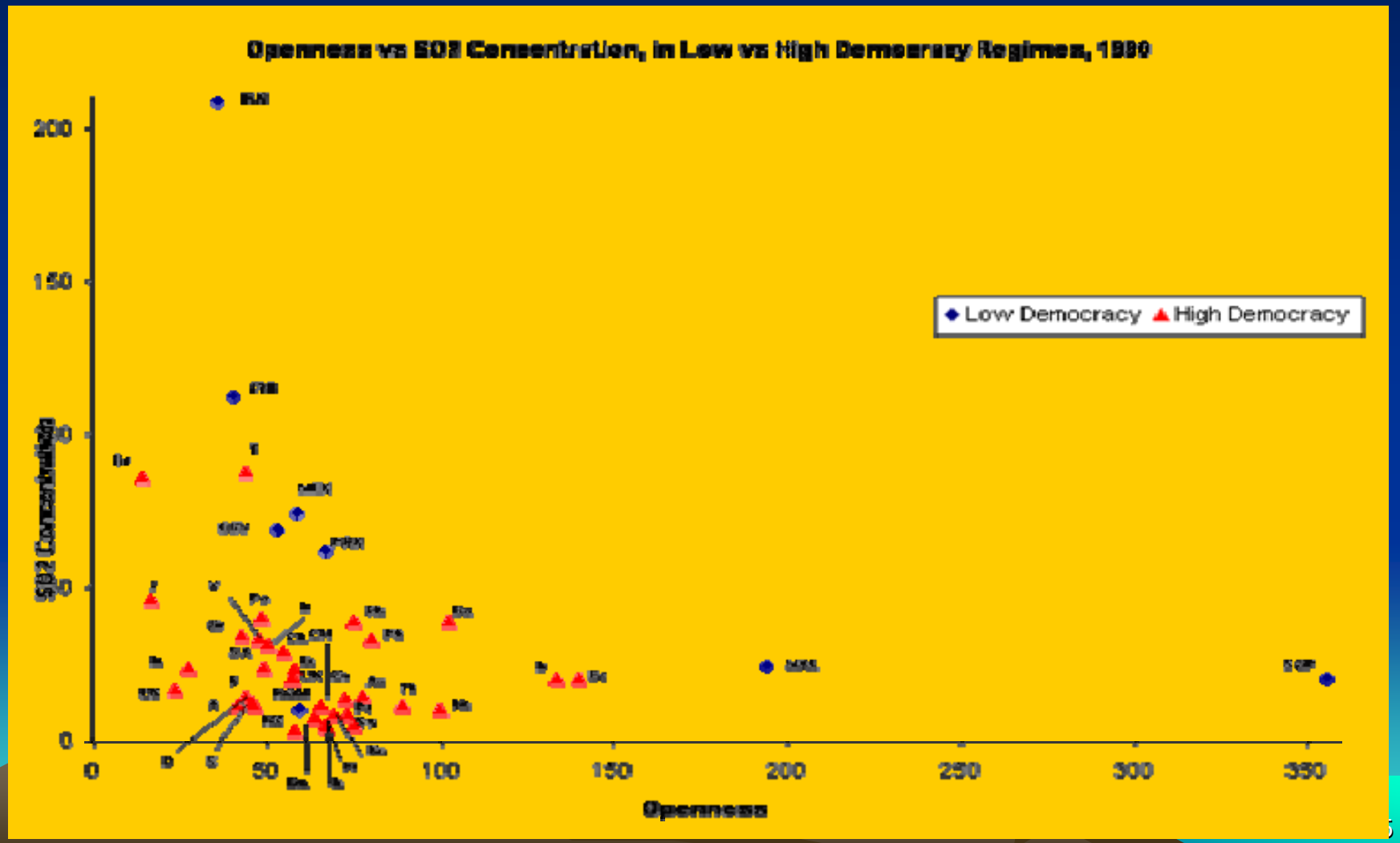
Grossman and Krueger (1995)

- **Environmental Kuznets Curve**:

  Economic growth (whether trade-led or not) is good for the environment *above a peak level of income.*

  - EKC is confirmed for some pollution measures, e.g., SO_2,
  - But rejected for CO_2 .
  - Democracy matters too => need effective national regulation, not just demand for clean environment.

SO_2 concentrations tend to fall with openness, cross-country, especially after controlling for democracy.



Do harmful or beneficial effects of trade dominate for environmental goals? Bottom lines:

- For SO_2
  - at low incomes, harmful effects (EKC) work against beneficial effects
  - at high levels of income, trade helps through both channels.
- For CO_2
  - Even at high levels of income, trade continues to hurt. <= Absent an effective multilateral treaty, the popular will cannot be enacted.

Addendum II: Frankel & Rose paper

- **Equations estimated:**
  - Growth equation
    (using gravity variable as IV for trade openness)
  - Environmental quality equation
    (using factor endowments as IV for growth)

Environmental quality equation

Source: Frankel and Rose, *R.Ec.& Stats.*, 2004

$$Enviro_i =$$

$$\varphi_0 + \varphi_1 (Y / pop_1)_{90,i} + \varphi_2 (Y / pop_2)_{90,i}^{\ 2}$$

$$+ \mu([X + M]/Y)_{90,i} + \pi(Democracy)_{90,i}$$

$$+ \lambda(LandArea/Cap)_{90,i} + e_i$$

IV for GDP/cap: investment, education…
IV for openness: geographically-based prediction of trade

Construction of IV for openness

First-stage regression of gravity equation

- $\log(Trade_{ij}/GDPi) = -.94 \log(distance_{ij}) + .82 \log(pop_j) + .53 Lang_{ij}$
  $(.05) \quad (.02) \quad (.11)$
  $+ .64 Border_{ij} - .27 \log(A_iA_j) - .47 \# Landlocked_{ij} + u_{ij}$
  $(.21) \quad (.01) \quad (.08)$

- Equation estimated for 1990.
- Number of Obs. = 4052.
- R2 = .28 (Robust standard errors in parentheses.)

Computation of Instrumental Variable

- Take exponent of fitted values of bilateral trade and sum across bilateral trading partners: Σj exp [Fitted log(Tradeij/GDPi)] .
- Correlation (trade ratio, generated IV) = .72

Measures of environmental damage

- SO2: sulphur dioxide, mean (in micograms per cubic meter), 1995
- NO2: nitrogen dioxide, mean (in micograms per cubic meter), 1995
- PM: Suspended Particulate Matter, mean total (in micograms per cubic meter), 1995
- Water: Rural Access to Clean Water
- Def: annual deforestation, average percentage change, 1990-95
- Energy: Energy depletion, in percent of GDP ("genuine savings")[1]
- CO2/capita: Carbon dioxide emissions, industrial, in metric tons/cap

[1] Energy depletion is a measure computed for the World *Bank's World Development Indicators*. It is equal to the product of unit resource rents and the physical quantities of fossil fuel energy extracted (including coal, crude oil, and natural gas). Table 3.15, http://www.worldbank.org/data/wdi2001/pdfs/tab3_15.pdf.

Addendum III:
The anti-globalization movement

The first big protests in Seattle, 1999

The WTO Ministerial in 1999

Quiz question:
Why did the protestors wear turtle costumes?

Answer:
WTO panel decision regarding US barriers against imports of Asian shrimp

Why did they march together in Seattle?

Category of demon-strator	Claimed consti-tuency	True position of constituency
Protestor in turtle costume	**Environ-ment**	In favor of the Kyoto Protocol
Labor union official	**Organized labor**	Against the Kyoto protocol; in favor of keeping out cheap imports from poor countries.
NGO volunteer	**Poor countries**	In favor of exporting to rich countries; in favor of Kyoto protocol only if it exempts them.

What do they mean when they say the WTO is an intrusive undemocratic bureaucracy?

- The WTO staff? A few thousand powerless technocrats working in a house on Lake Geneva.
- The Articles of Agreement? Entirely the outcome of negotiations among the member countries.
- WTO panel rulings that interpret the rules? That must be it.

Typical WTO panel cases

- Tariffs or other measures that discriminate against producers in some trading partners,
  - either in favor of other trading partners

    (potential violation of MFN principle of Article I) or
  - in favor of “like products” from domestic producers

    (potential violation of national treatment provision of Article III).

Typical WTO panel cases, continued

- If targeted country files a WTO complaint alleging such a violation, the question is then whether the measure in question is permissible under Article XX
  - which allows for exceptions to the non-discrimination principles for environmental reasons,
  - provided that the measures in question are not “a means of arbitrary or unjustifiable discrimination” or a “disguised restriction on international trade.”

Addendum IV:
Potential conflicts of GCC policy with *other* aspects of WTO regime

- Efficiency standards &
  the Technical Barriers to Trade agreement.
- Agreement on Subsidies & Countervailing Measures
- Agreement on Agriculture
- Labeling requirements

Potential conflicts with other aspects of WTO regime

- Efficiency standards as part of a country's program to reduce emissions, e.g., fuel standards for autos
  - Permissible under WTO, even if with side-effect of benefiting, e.g., Japanese products over EU or US exports, provided no needless discrimination.
  - But there is also a more restrictive Technical Barriers to Trade agreement, favoring widely accepted international standards.

Potential conflicts with other aspects of WTO regime, cont.:

Agreement on Subsidies and Countervailing Measures

- Possible conflicts when Kyoto Parties:
  - exempt particular favored industries from an energy tax, or
  - give out domestic emission permits in a non-neutral way, or
  - reward their companies with credits for CDM and JI projects

Potential conflicts with other aspects of WTO regime, cont.:

Agreement on Agriculture

- The Doha Round, if successful, would involve limits on massive agricultural subsidies.
- Payments under environmental programs should be “in the green box”: exempt from ban on subsidies.
  - Subsidies for carbon sequestration in forestry okay
  - or for the reduction of methane emissions in agriculture
  - but exemptions for handouts to favored sectors such as ethanol should not be allowed unless scientifically found environmentally beneficial in reality rather than in name alone.

Potential conflicts with other aspects of WTO regime, cont.:

Labeling requirements

- TBT agreement (Technical Barriers to Trade) clearly allows non-discriminatory labeling, e.g., according to energy efficiency.
- But WTO law could be interpreted as not allowing a government to require labels specifying greenhouse gas content in the production process.
- I believe in letting consumers decide some issues with the aid of eco-labeling, rather than leaving no options in between voting & window-breaking for people who want to express their views.
- There is always the risk that labeling is politically manipulated.
- But it is less intrusive than import restrictions.
  (EU labeling of GMOs, while lacking adequate scientific foundation, is a better way of venting strong European feeling on the subject than outright bans on imports from the US.)
- It would be desirable for the WTO to establish rules for labeling.