PASTURE 1: COUNTERVAILING TARIFFS

Draw picture of countervailing tariffs.

Fundamental problem: the countervailing tariff can't get the price right in the producer market. So:

- Overconsumption in producer market. Question: is this a problem in shrimp turtle? Producer market is small relative to importer!
- A different way of looking at this is that for a given level of production, consumption is misallocated: person B in the Importer market has higher WTP than person A in the Producer market, but A consumes while B does not.

Question: What other differences from turtle case?

- Push question: Is this a tariff on shrimp or on shrimp produced without TEDs?
    - Process vs. product: it is legal to impose a tariff on the process, but not the product
    - A ban on shrimp gives no incentives to change the process.
- Push question: Why doesn't Malaysia have these regulations?
    - Malaysia et al. may have poor enforcement capacity.
    - Endangered species are a global public good and they may be trying to free ride.
        - The damages may be perceived mostly in the U.S., a rich country.

Worry: use of countervailing tariffs as a trade barrier

PASTURE 2: POLLUTION HAVENS

Why evidence was weak?

Statistical problems:

- Measurement error in regulation => attenuation bias.
- Omitted variables bias: regulation correlated with good institutions/well-functioning markets.
    - How can we do this? Panel!
- Little persistent variation in regulation: most trade between developed countries. So the standard error is large

Or it might not be actually true:

- Difficult to relocate?
- Pollution abatement costs are a small part of overall costs.

Then discuss Greenstone's paper and the new identification strategy

Should a regulator weaken environmental regulation?

No! Regulator that maximizes local social welfare should still equate local costs and benefits

Why would this not happen?

- Kolstad/Oates and Schwab (1988) argument: Pre-existing distortionary tax on capital hurts business. To make up for this, weaken environmental regulations.
    - My response: This assumes too much rationality on the part of the regulators.
- The externality is global, not local
    - Want to free ride on others' contributions.
- Regulatory capture: owners of capital get the regulations relaxed
- Poor enforcement capability (developing countries)

PASTURE 3: SIZE OF IEAS

Intro to IEAs:

Global public goods.

Example: Montreal. Ppt slide.

Question: What are the pluses and minuses of having strong punishment for violators? Reduce defections ex-post, but make it harder to recruit!

Question: How else different than Kyoto: much smaller!

Set up public goods game:ppt slide.

N identical countries, indexed i

Country can emit or abate: $e_i = \{0,1\}$

Payoffs:

$\pi_i = e_i - \gamma[\Sigma_j e_j]$

Set $\gamma = 0.4$

Get five players.

Game 1: Public Goods Game.

Play once. Each person writes down whether or not to abate. Then ask them to reveal their answers.

Does this look familiar?

Answer: public goods game

What's the difference?

Just the sign of the decision: emitting imposes a negative externality, while contributing to the "pot" was a negative externality.

Solve for the equilibrium.
$\pi i = ei - \gamma[\Sigma jej] = e_i - 0.4e_i - 0.4[\Sigma_{j\setminus i}e_j]$
$ei^* = 1$ unless $\gamma \geq 1$.

Solve for the social optimum.
Social optimum is $e = 0$ unless $\gamma < 1/N$

Question: at what values of γ are the social and individual optima the same? Put differently, when do we NOT need an IEA?
$\gamma \geq 1$ or $\gamma < 1/N$
Why?
- In the former case, the individual sees such great gains that he abates regardless of others. Not a large free rider problem
- In the latter case, the social returns to abatement are small, so we don't want countries to abate!

Game 2: IEA Game

Get a new five players

Stage 1: "Membership stage": Countries decide whether to participate or not
Stage 2: "Emissions Stage": Agreement countries decide whether to abate.
Looking for a Subgame Perfect Nash Equilibrium.

Play the game sequentially:
1. Do people want to join?
2. Then have them publicly decide whether to abate.
3. Then ask them if they are "happy," i.e. best responding in a Subgame Perfect Nash equilibrium.
Then repeat stage 1.

Question: Can anybody see what the SPNE is?

Solve via backwards induction
Emissions stage:
Question: What will the non-participants do?
> They will emit

What will the participants do? M participants
> They will abate if $M \geq 1/\gamma$.
> Otherwise the "social" returns within the participant group are too low. (see above)

To see this:

- If abate: payoffs to participants are $0-\gamma(N-M)$
- If emit: payoffs to participants are $1-\gamma N$
- $0-\gamma(N-M) \geq 1-\gamma N$ for abate. $M \geq 1/\gamma$

Membership stage:

Question: Who will want to join? i.e. How many people?

Can we sustain a 1-person "coalition"?

No: we know that the person will not want to contribute. The coalition is too small.

Can we sustain a 5-person coalition?

No – any one person will defect and hope that the coalition will be sustained. The remaining coalition will still choose to abate.

The coalition is too big.

Try a 3-person coalition.

A country wants to free-ride. But what happens when they try that? The remaining coalition chooses not to abate! Because now $M=2 < 1/\gamma=1/.4=2.5$.

So there is only one stable coalition size. It is partial coalition.

Question: Does stable coalition size grow or shrink with the magnitude of the problem? Explain intuition.

So now play the game again. Question: Who wants to get called on first? Who wants to get called on last?

Question: In the Kyoto Protocol process, Europe has formed a coalition, while others have defected. Does this game explain what's happening? What differences?

- Heterogeneous countries. Some have larger e_i and thus capture more of their own returns.
  - Example: Give one participant e=10. They automatically set e=0 in emissions game.
  - Is there any country like this in Kyoto? Apparently not – no one country is unilaterally abating.
- Local pressure groups. How to add to model?
  - Either reduce the returns from emitting or increase the returns to joining a coalition.

Question: How does this compare to OPEC?

- A group of countries that restricts output in order to raise prices, which increases profits for seller countries.

- Partial participation: non-OPEC countries "free ride"
- Cheating within the cartel: some countries exceed their quotas
  - Venezuela is the only country below the quota because of mismanagement. (Maybe also Iraq).
- Heterogeneity: Saudi Arabia is very large and so captures more of the benefits of its own withholding. So they are a very active member of OPEC and are very

Side question: What does the existence of OPEC say about the optimal level of the Pigouvian tax on fossil fuels?

Push question: Pre-existing distortions from two weeks ago?

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