Discussion of “Transboudary Air Pollution in East Asia: Different bargaining power from Source-Receptor Relationship”

By Hayeon Jeong

Roberto Zuniga

December 10, 2021

Roadmap

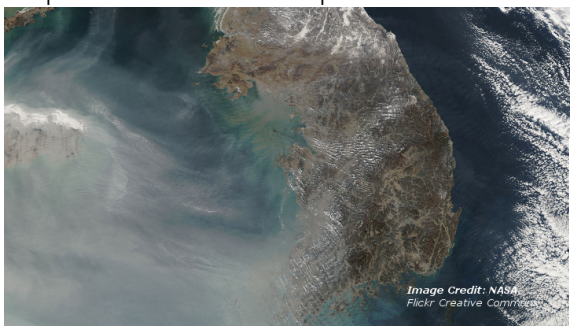
What's the paper about?

Comments and suggestions

Conclusions

Transboundary Air Pollution

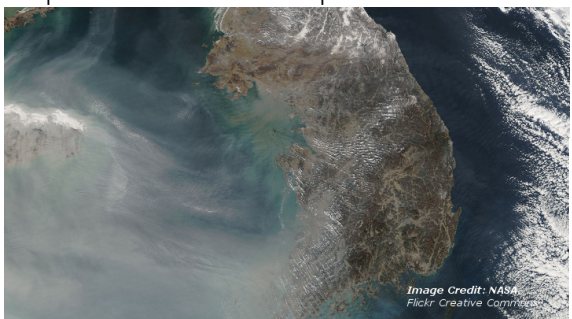
- Air pollution does not respect international borders



Source \ Receptor	China	Korea	Japan
China	91	32.1	24.6
Korea	1.9	51.2	8.2
Japan	0.8	1.5	55.4

Transboundary Air Pollution

- Air pollution does not respect international borders



Source \ Receptor	China	Korea	Japan
China	91	32.1	24.6
Korea	1.9	51.2	8.2
Japan	0.8	1.5	55.4

- China, Korea and Japan are not internalizing the effect of domestic emissions on others

An International Treaty to Reduce Air Pollution

- China is the biggest polluter. How to get them on board?
  - → Transfers

An International Treaty to Reduce Air Pollution

- China is the biggest polluter. How to get them on board?
  - → Transfers
- How should the gains be distributed?
  - → Hayeon's idea: use Nash bargaining solution and extract bargaining power from the S-R matrix

An International Treaty to Reduce Air Pollution

- China is the biggest polluter. How to get them on board?
  - → Transfers
- How should the gains be distributed?
  - → Hayeon's idea: use Nash bargaining solution and extract bargaining power from the S-R matrix
- Outcome of estimation:

Abatement

	Don't join	Join
China	96.6083	102.7385
Korea	1.2543	134.1471
Japan	6.75	134.1471

Payoff

	Don't join	Join
China	497.2036	1471.3
Korea	9.1299	182.5679
Japan	47.848	88.2245

Roadmap

What's the paper about?

Comments and suggestions

Conclusions

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible
- Questions and suggestions

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible
- Questions and suggestions
  - → The optimization problem is formulated as

$$\max_{a_i} \Sigma_i \pi_i(a) = \max_{a_i} \Sigma_i (B_i(a) - C_i(a_i))$$

But B_i may depend on individual abatement. The S-R matrix may help estimating $B_i(a_j)$.

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible
- Questions and suggestions
  - → The optimization problem is formulated as

    $$\max_{a_i} \Sigma_i \pi_i(a) = \max_{a_i} \Sigma_i (B_i(a) - C_i(a_i))$$

    But B_i may depend on individual abatement. The S-R matrix may help estimating $B_i(a_j)$.
  - → The results suggest that China is actually paying Korea and Japan to reduce their emissions

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible
- Questions and suggestions
  - → The optimization problem is formulated as

    $$\max_{a_i} \Sigma_i \pi_i(a) = \max_{a_i} \Sigma_i (B_i(a) - C_i(a_i))$$

    But B_i may depend on individual abatement. The S-R matrix may help estimating $B_i(a_j)$.
  - → The results suggest that China is actually paying Korea and Japan to reduce their emissions
  - → Why are China's marginal benefits so big? Perhaps include non-linearities or exposure-weighted damages.

Comments and suggestions

- Comments
  - → Interesting application of the theory
  - → Simulation results suggest that a treaty is feasible
- Questions and suggestions
  - → The optimization problem is formulated as

    $$\max_{a_i} \Sigma_i \pi_i(a) = \max_{a_i} \Sigma_i (B_i(a) - C_i(a_i))$$

    But B_i may depend on individual abatement. The S-R matrix may help estimating $B_i(a_j)$.
  - → The results suggest that China is actually paying Korea and Japan to reduce their emissions
  - → Why are China's marginal benefits so big? Perhaps include non-linearities or exposure-weighted damages.
  - → How much PM can be abated? (how much of it is Yellow dust?)

Roadmap

What's the paper about?

Comments and suggestions

Conclusions

Conclusions

- Hayeon's paper addresses an important problem. It suggest that a solution to transboundary air-pollution is possible.
- Interesting application of the theory
- Future work should refine estimation analysis: maybe account for non-linearities in marginal benefits, or exposure-weighted estimates.