Unilateralism in the Provision of Global Public Goods

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Global Public Goods

- Most major international issues involve global public goods
- These are ones where:
  - Global "output" determined as function of efforts of all nations
  - Impact of GPG affects all nations, whether they wish it or not.
- Examples:
  - Climate change, international security, infectious diseases (SARS,…), illegal drugs, international trade and finance, …
- Our "mental models" may not reflect the correct GPG.

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Public Good Production

- ***Additive technologies.*** The standard case where the production of the public good is simply the sum of the contributions of all the parties.
  - global warming and most pollution
- ***Best-Shot technologies.*** Output the result of the maximum of the individual contributions.
  - new technologies such as low-carbon fuels, geoengineering
- ***Weakest-Link technologies.*** Many cases exhibit a technology where the overall production is only as good as the Weakest Link in the chain.
  - Illegal drugs, dikes and levees
- ***Conflict technologies ("the good guys versus the bad guys").*** Output reflects the *difference* between the largest and the smallest contributions, or alternatively the difference between the producers of goods and the producers of bads.
  - War, terrorism, nuclear proliferation

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Efficient Provision

- ***Additive technologies.***
  - Standard result of $MC_i = \Sigma MB_j$
- ***Weakest-Link technologies.***
  - Equal production of all.
- ***Best-Shot technologies.***
  - Concentrate production in low cost producer
- ***Conflict technologies.***
  - Concentrate production in low cost producer and destroy bad guys.

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Actual Provision

- ***Additive technologies.***
  - Standard result of $MC_i = MB_i$. Lead to underprovision, free-riding
- ***Weakest-Link technologies.***
  - Strong tendency for efficient production.
- ***Best-Shot technologies.***
  - Concentrate production in low cost producer, but Nash production leads to significant underprovision (> additive)
- ***Conflict technologies.***
  - Same as Best-Shot, but can lead to inefficient destructive unilateral actions.

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Simulations

1. Where all countries use a cooperative approach in the Additive model (efficient solution)
2. Where countries act in a purely self-interested (Nash) way in the Additive model
   a. where countries group into 6 blocs (US, the Kyoto Bloc, OPEC, ...).
   b. where there are no regional blocs.
3. Where climate change is treated in a unilateral fashion following the Conflict model
   a. where the lead country uses world preferences.
   b. where the lead country uses U.S. preferences and damage function

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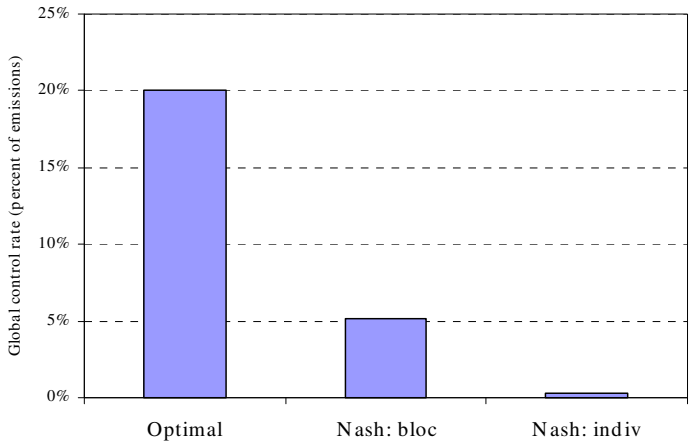
Emissions control rate in Additive approach



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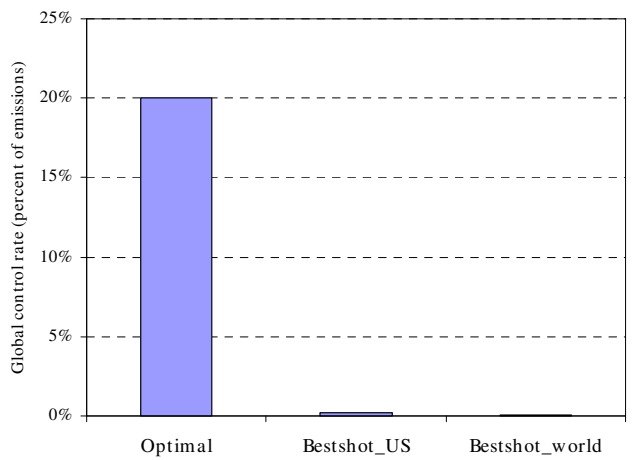
Emissions Control Rate in Unilateralist Approach



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Impact on Global Temperature of Different Approaches