



**SYMPOSIUM**  
Green Growth and Economic Policy  
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# economic models for green growth: lessons for policy-making

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# Introduction / growth / efforts / prices / protection / exports / summary

## Introduction

What did I do?

1. Theory based on formal analysis
2. National environmental policies based on CGEs
3. Global climate policies based on IAMs
4. Empirical environmental economic studies based on statistics

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## Lessons from Economic Models

### Positives

1. Green growth is good (not bad) for the economy
2. Green growth is hard work ( $\neq$  high costs)
  - ◆ Support for industry & export ( $\rightarrow$  innovation) + policy-induced direction
3. Pricing resource use is simple, effective, induces innovation, but politically hard

### Negatives

5. Protecting dirty industries is politically inviting, but very costly
6. Mining & exporting too much resources (oil, coal) is bad for long-term growth

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## Green growth is good for economy

### 2 Findings from theory & applied economic models

#### 1. Innovation is major driver of long-run global economic growth

- ❖ Factor 2 increase relative to 1977
- ❖ Colombian potential: 2%/yr

#### 2. Resource policy has modest costs

- ❖ max 1-10% over 20 years
- ❖ Colombian potential: statistically insignificant

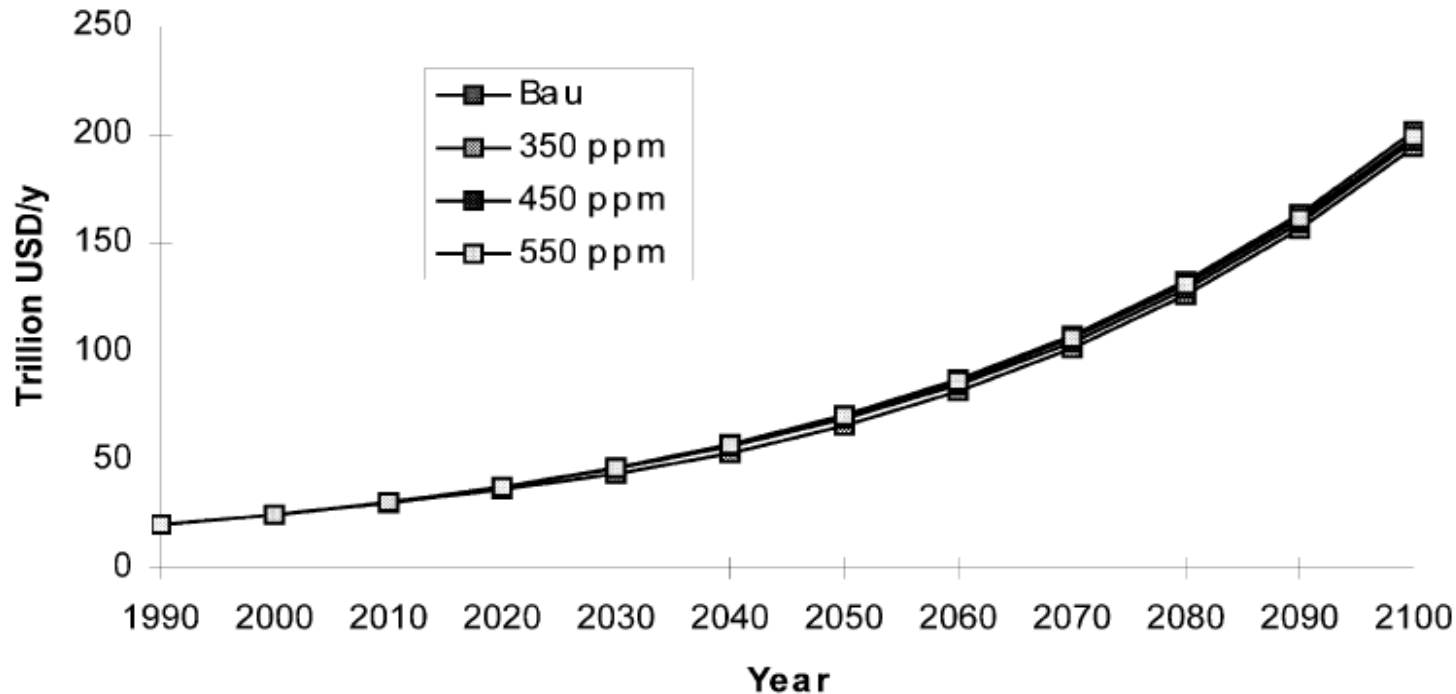
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## Green growth is good for economy

Azar &  
Schneider 2002:

Costs of climate  
policies <<  
benefits of good  
economic growth  
institutes

Global GDP



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## Green growth is good for economy

### 2 Findings from empirical research

3. Institutions (education, law enforcement, corruption, property rights, bureaucracy, predictability of policies, freedom, culture) determine gap with frontier
  - ❖ Factor 2.5-5 between Latin America and EU
  - ❖ Colombian potential: +2%/yr
  
4. Rich countries (on average) have better environmental policies
  - ❖ Popular explanations: “they can afford” vs “green policies are good”
  - ❖ Neither of the two: rich countries (on average) have better institutions that protect the interest of the citizens

“Progress without destruction is possible”

Chico Mendes (1988, Brazil)

[Only pessimists call environmentalists worriers]

“We deserve to thrive”

Kathy Jetnil-Kijiner (2014, UN / Marshall Islands)

[We must aim for, and not be satisfied with less than, a better future]

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## Green growth = hard work

- Green growth ≠ Business as Usual
  - Green growth ≠ Hippy style organic
    - ◆ NOT: Bio-economy instead of conventional industry
  - Green growth = conventional growth + guided direction
1. Conventional growth = support industry & support exports
    - ❖ Colombia develop broad export industry that can compete with other countries
    - ❖ Colombia needs to build infrastructure that connects it to the world
  2. Guided direction = reducing resource use (e.g. GHG emissions)
    - ❖ Colombia must increase land/water/fossil fuel efficiency
    - ❖ Colombia needs to develop land registration/substantial water charges/vehicle regulation/higher coal & gasoline (or carbon) prices



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## Pricing resource use

1. Governments cannot micro-manage the economy
2. Private firm is major contributor to efficient production and innovation
3. Provide the correct incentives to guide efficiency and innovation
4. Levy **taxes (tasas)** on land use, water use, fossil fuel use by both firms and households (including indirect fossil fuel use e.g. through electricity)
  - ◆ Suggestion from models: optimal carbon price rises proportional to (nominal) GDP
5. Use resource taxes (and tasas) to reduce other taxes (e.g. labor tax, profit tax, VAT)
  - ◆ Don't waste resource tax/tasa revenues for 'green' subsidies (EU)

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## Pricing resource use

### The poverty-environment trade-off

- Poor people cannot afford to pay environmental taxes/tasas
- Colombia has developed fine-tuned system of level-dependent utility prices

### Empirical findings

- You cannot pull the poor out of poverty through low fuel costs
  - ◆ Consider those countries that try to appease the citizen through low fuel costs
- More effective is to grow well-paid jobs through improving institutions
  - ◆ Consider Japan/Taiwan/South Korea/China

### Political economy

- ◆ Delaying resource taxes/tasas makes their establishment more difficult
- ◆ Regulate automobiles, buses, motors BEFORE every citizen has one

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## Protecting dirty industries

### Models + empirical findings

1. Industries tend to lobby policy-makers to increase their rents
  - ◆ Colombia can learn from US 'mistakes': car-manufacturers oppose public transport
  - ◆ Colombia can learn from EU 'mistakes': freely-allocated emission permits = multi-bn Euro rents, given to the big firms
2. Governments tend to back up losers (Baldwin&Robert Nicoud, 2007)

### Why is that costly:

1. Efficient policies require that government captures rent!
2. So that (truly) distortionary taxes can be minimized

Government policies should do the opposite as the 'natural' tendency

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## Mining & exports

### Empirical findings of resource-rich countries

- Dutch gas revenues killed the industry, caused mass-unemployment in 1980s.
- Africa is resource-rich but poor
- Venezuela...

### Lessons from Norway

- Famous exception to the resource curse rule
- Norway puts all oil+gas revenues in a FUND!
- Government only receives the interest on FUND investments

### Lesson for Colombia

- Stop exporting oil & coal to pay for imports

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## Summary

### Theory

- Green growth requires support for industry + resource taxes/tasas
- green growth is not a problem, but requires a big effort, and steady policy makers (sectors who lose want to capture rents)

### Colombia targets (?)

- stabilize population
- 4%/yr economic growth (mainly through institutional improvement)
- resource prices rising proportional to or above country (nominal) GDP level

### Applied models

- support theory, but do not expect precise quantitative estimates
- specific advice requires good researchers; separately for practical & theory