

ECON 326: Economics of Developing Countries

TA Session 9

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Today's Agenda

- ▶ Burgess et al. (2019)
- ▶ The Curse of Natural Resources
- ▶ Practice final

Burgess et al. (2019)

The Brazilian Amazon's Double Reversal of Fortune

- ▶ Environmental damage entails an externality - a market failure
- ▶ Requires government involvement to regulate or tax activity to correct this externality
- ▶ State capacity to effectively regulate is weak in many developing countries
- ▶ Political economy can be important

- ▶ Explore how national policies can exert regulatory control over conservation
- ▶ Exploit what happens at international borders
- ▶ One of the most important global ecosystems: the Amazon rainforest
 - ▷ The rate of deforestation will affect global warming
 - ▷ The Amazon is a global public good

- ▶ Satellite data on deforestation - even across borders, from 2000 - 2018
 - ▷ High resolution - can zoom in for precise effects
- ▶ In 2006, Brazil introduced deforestation policies
- ▶ Spatial RDD design - popular strategy using borders for policy effects

Satellite Data

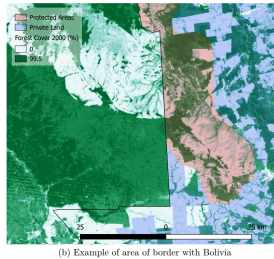
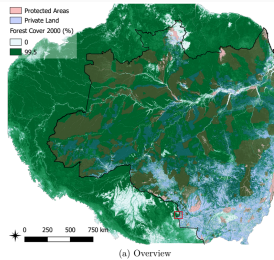


Figure 2: Satellite Image of a Border Segment (Percentage of Forest Cover in 2000)

Fact 1

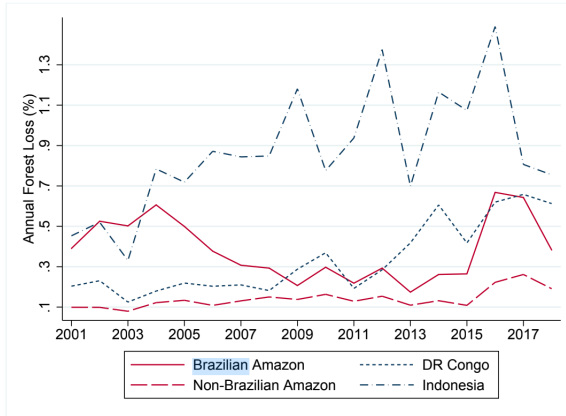


Figure 1: Forest Change in the Amazon, DR Congo and Indonesia, 2001-2018

- Until 2005, deforestation level and rate significantly higher on the Brazilian side

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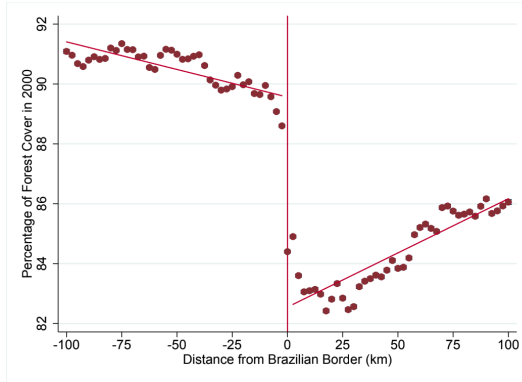
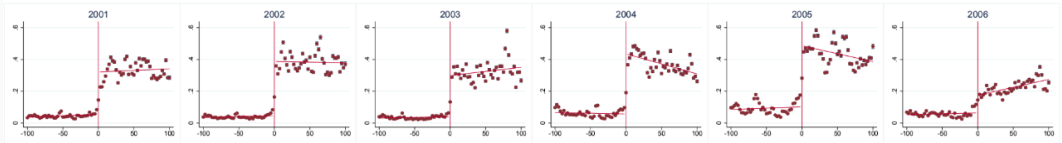


Figure 3: Average Forest Cover in 2000 by Distance from Brazilian Border

- Deforestation is visually apparent: forest cover drops sharply exactly at the national border.

Fact 2

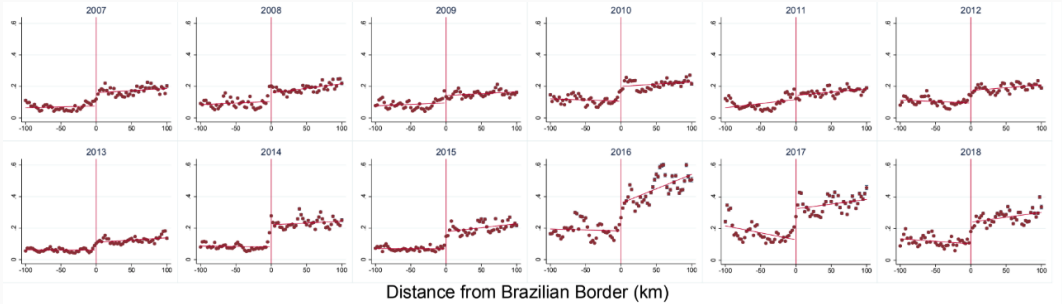


- Discontinuity in deforestation rates disappears in 2006 - the first reversal

What happened in 2006?

- ▶ In 2003, in the Lula government, Marina Silva appointed as Minister of Environment
- ▶ She was from the Amazon, and had a strong environmentalist stance
- ▶ Law that allowed satellite-based deforestation detection system (DETER) to become a key tool
- ▶ Sent in federal police and troops to arrest illegal loggers and confiscate their machinery

Fact 3

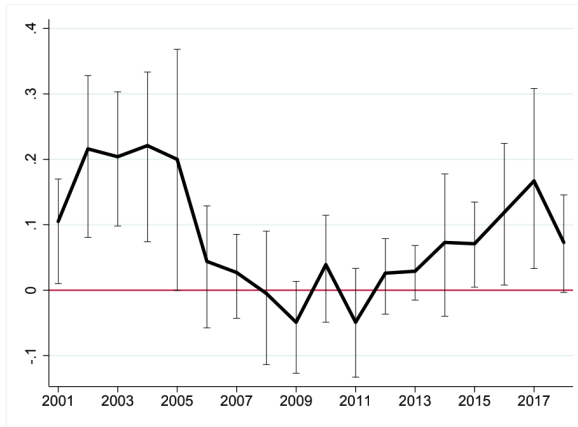


- Positive effects relatively short-lived
- Deforestation resumes growing in 2014 – the second reversal

What changed?

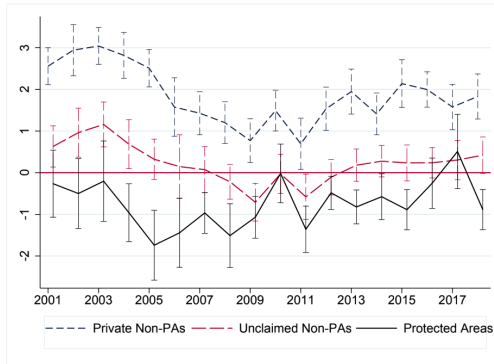
- ▶ New government - gave amnesty to those engaged in illegal deforestation before 2008
- ▶ 2014 was a politically turbulent year
- ▶ Next president introduced laws that made it incentive-compatible for public land grabs

The Double Reversal



(a) Overall Effects (OLS model)

Fact 4



(b) Heterogeneous Effects by Land Type (Poisson model)

Figure 5: Regression Discontinuity Coefficients by Year

- Land use restrictions matter
- Protected areas have always been less deforested

Conclusion

- ▶ Combined, these results demonstrate the reach of the Brazilian state to exploit or conserve its natural resources
- ▶ Suggest that rapid deforestation in early 2000s was a consequence of a pro-exploitation policy environment
- ▶ Policy stance rapidly reversed in 2006-2013 with laws introduced
- ▶ But the position stalled and reversed in the post-2013 period with economic and political crisis collided with weakened forest conservation laws
- ▶ So state capacity does matter!

The Curse of Natural Resources

What is it?

- ▶ The observation that countries rich in natural resources tend to perform badly
- ▶ Also called the paradox of plenty or the resource curse
- ▶ Sachs and Warner maybe the first to document this using econometrics in a paper in 1995

Descriptive Evidence

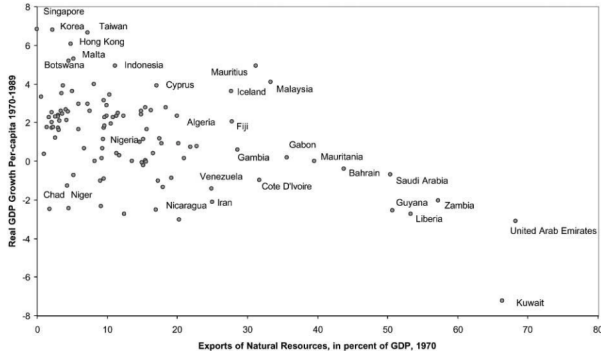
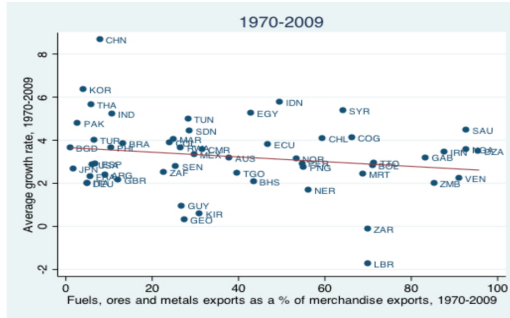


Fig. 1. Growth and natural resource abundance 1970–1989.

- ▶ No countries with extremely abundant natural resources in 1970 grew rapidly for the next 20 years

Descriptive Evidence - Persistence

Figure 1: Statistical relationship between mineral exports and growth.



Data source: *World Development Indicators*, World Bank

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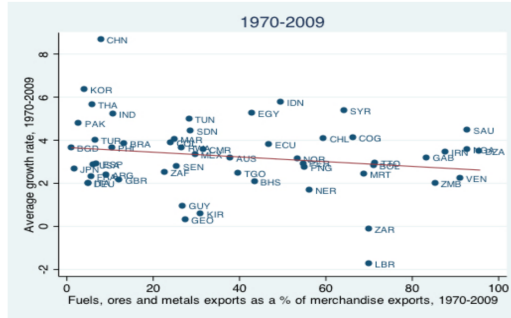


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- ▶ But clearly no positive relationship

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 - ▷ Low short-run elasticities - large price responses to small shocks

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- ▶ Permanent crowding out of manufacturing

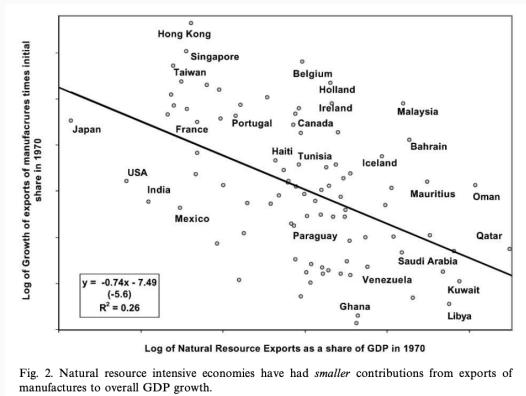
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 - ▷ Diversification is desirable - in particular, industrial policy

Crowding out of manufacturing?



- ▶ Resource abundance tended to render the export sectors uncompetitive
- ▶ So never successfully pursued export-led growth

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 - ▷ Economy more vulnerable to resource-related shocks

Practice Final
