

Trade Openness and Leapfrogging: Some Reflections and Evidence on the Asian Growth Model



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Introduction

- All countries want to grow fast on a sustained basis
 - Asia has produced many growth miracles
 - The original “four little dragons”: Korea, Singapore, Hong Kong and Taiwan
 - The tiger economies: Malaysia, Thailand and Indonesia
 - Recent “growth miracles”
- Is there a recipe of the Asian success that can be replicated in the future and by economies outside Asia?
- As countries in Asia and elsewhere are coming out of a global crisis, it is a good time to look back and think ahead



The Asian growth model

- At the risk of over-simplification, two aspects merit particular attention
- Trade openness
 - Taking down barriers to both imports and exports
- Leapfrogging
 - Use of government policies to promote high-tech and high domestic value added industries, presumably beyond endowment and current stage of development



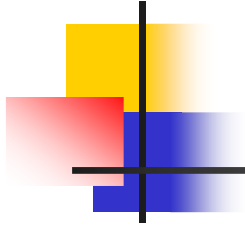
Trade openness

- Taking down barriers to both imports and exports
- De-monopolizing / “democratization” of trading rights
- Not letting the real exchange rate over-valued
- \neq “outward oriented strategy” since it doesn’t have to come with an open capital account
- Evidence is overwhelmingly in favor
- Frankel and Romer (AER 1999)
 - Skepticism: Rodriguez and Rodrik, 2000
- “Life and death implications” Wei & Wu, 2004
- New evidence: Feyrer (2009)
- Evidence in Kose, Prasad, Rogoff and Wei (2003) & (2009)



Leapfrogging

- Use of government policies to promote high-tech and high value added industries, presumably beyond current stage of development and factor endowment
- Not bound by but to leapfrog or jump **ahead of comparative advantage**
- Unlike trade openness and growth, systematic evidence on leapfrogging and growth is rare
- Primary reason is data challenge: not easy to define sophistication of production beyond one's endowment, and therefore difficult to quantify leapfrogging
- The only but influential study:
 - Hausman, Hwang and Rodrik (2007)



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- Review some new evidence on leapfrogging and growth based on cross country experiences and variations across regions within a large Asian economy
 - “Does a leapfrogging growth strategy raise growth rate? Some international evidence,” by Zhi Wang, Shang-Jin Wei, and Anna Wong.



Does a LEAPFROG STRATEGY work logically?

Yes

(Example, Rodrik et al):

■ It corrects market failure

- Some goods have higher “spillover effects”
- Positive externalities via learning-by-doing

■ No

(example: Justin Lin)

- Government failure could overwhelm its benefits
 - Incompetence
 - Corruption
- Success offset by lack of development in other industries due to distorted resource allocation



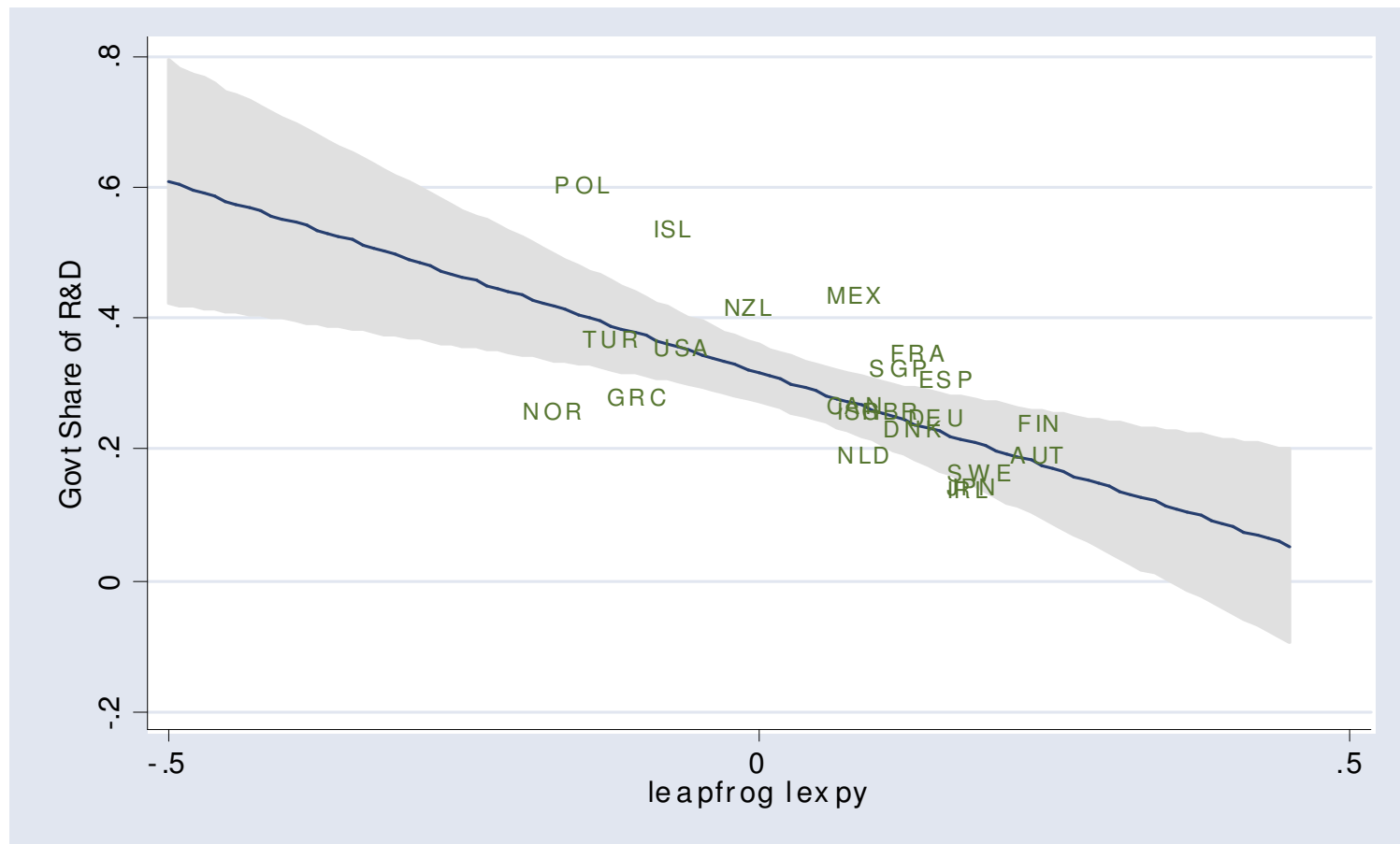
Only one paper so far provides evidence,
which seems to affirm a role for leapfrogging

Hausman, Hwang, and Rodrik (2007)

“What You Export Matters,” *Journal of Economic Growth*, 2007

*But the measure of leapfrogging is subject to debate,
and in any case can benefit from cross checking
against alternative measures*

Export Sophistication and Government share of R&D, 2005





New evidence from Wang, Wei and Wong

- Overcoming the measuring issue
 - How to measure sophistication of production structure beyond average
- International evidence: do countries that pursue a more aggressive leapfrogging strategy grow faster?
- Intra-national evidence: do regions that pursue a more aggressive leapfrogging strategy grow faster?



Measuring leapfrogging

- Production sophistication difficult to measure
 - Government efforts not always quantifiable
 - Existing data too coarse (100 sectors or less)
 - Not international comparable
- One solution: use trade data
 - Export structure reflects production structure
 - Far more detailed product/sector classification (5000 products rather than 100 sectors)
 - International comparable



Measuring leapfrogging

- To ensure reliability of inferences, use multiple measures
 - Implied income in a country's export bundle
 - Implied income in exports adjusted for unit values
 - Distance in a country's export structure to those of high-income countries
 - Share of advanced and technology products (ATP) in a country's exports



Example: ATP share in exports

	Sector Label	HS 6 Product Line
High Tech HS 6 Category Line Examples ...	Life Science	Compound optical microscopes
	Opto-Electronics	Digital automatic data processing with a central processing unit
	Information & Communications	Digital automatic data processing with storage, input or output units
	Flexible Manufacturing	Machines and apparatus for resistance welding of metal, fully or partly automatic
	Advanced Materials	Optical fibre cables
	Aerospace	Turbo-propellers
	Electronics	Digital monolithic integrated units
	Biotechnology	Antisera and other blood fractions, vaccines



2 most useful lists of ATP products

- **US Census Bureau: 700 out of 20,000 HS-10 digit products**
 - **Narrow conversion: 92 HS-6 digit products (of which all HS-10 products are ATPs)**
 - **Broad conversion: 157 HS-6 digit products (of which at least 25% of the HS-10 products in any given HS-6 category are ATPs)**
- **OECD: 195 of 5 digit-SITC products**
- **Our measure of ATP shares:**
 - **Narrow ATP definition: An HS-6 product is defined as ATP if it is on both the narrow US list and the OECD list**
 - **Broad ATP measure: An HS-6 product is defined as ATP if it is on either the broad US list or the OCED list.**



Measuring leapfrogging

- For any given measure, benchmark it against per capita income and human capital (proxied by average years of schooling) in a statistical regression framework
 - JW Lee's contribution to schooling measure
- In other words, not absolute but relative sophistication is taken as a measure of leapfrogging



Examine leapfrogging and growth across countries

- In a standard cross-country growth regression of per capital income, embed a measure of export sophistication, conditional on initial income and human capital
- 42 countries, 1992-2003
- Instrumental variables: export sophistication on national leaders' professional and educational background



Empirical results

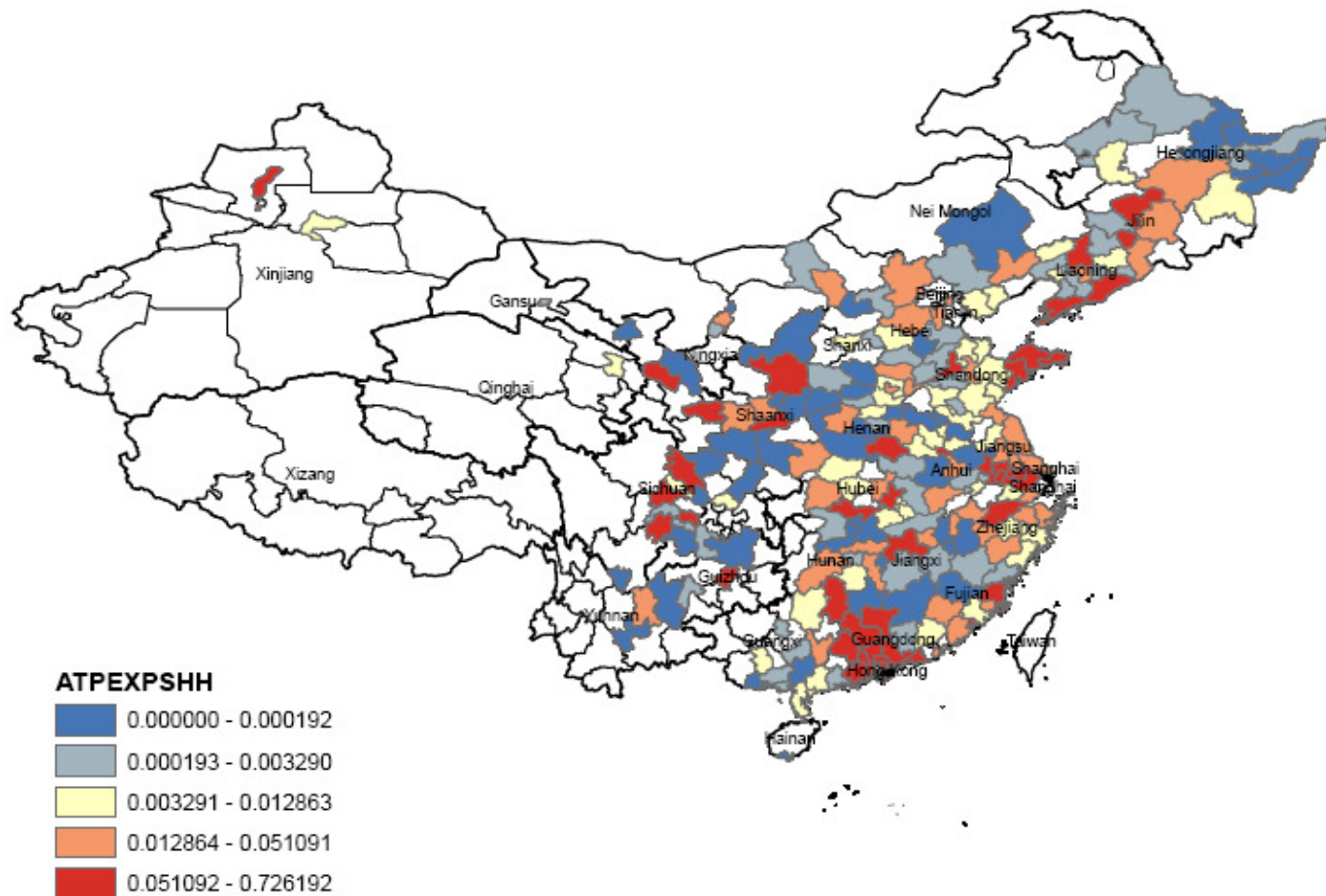
- No strong and robust evidence across different measures of leapfrogging that a leapfrogging strategy raises growth rate systematically



Additional evidence: within a country

- Why supplement cross-country evidence?
 - History, legal system, and other institutions can be more plausibly held constant
- Evidence from regional variations within China?
 - Lots of local government activism
 - Many geographic units -> statistical power

ATP shares in Chinese Cities





Evidence from within China

- Same statistical framework:
 - Relate regional per capita GDP growth to one of several measures of local leapfrogging
- Result: No strong and robust support across measures for a positive growth effect of a leapfrogging strategy



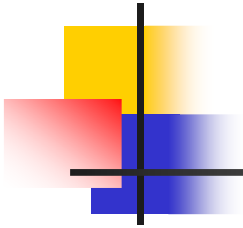
Summary

- While one could make a case in theory for a leapfrogging strategy, and one can give anecdotes of success, there is no systematic, robust, and strong evidence in the data, either across countries, or across regions within a large country, that such a strategy actually systematically raises growth rate.
- Smart interventions – ones that can identify market failure, avoid rent-seeking and special interest capture – are difficult



The Asian model tested by the 2008-2009 global crisis

- Can trade openness continue?
 - Conflict with global current account imbalances?
 - Trade openness \neq massive trade surplus
 - Small countries won't run into constraint even with surplus
 - Real exchange rate could adjust
- Is there a new opportunity for leapfrogging?
 - The need for stimulus in a recession also comes in temptation for leapfrogging policies
 - Evidence for stimulus \neq evidence for leapfrogging



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- Terima kasih!
 - Thank you!