

RIETI Policy Symposium

Frontier of Inter-firm Network Analysis: Power of network and geographical friction

Handout



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March 8, 2016

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<http://www.rieti.go.jp/en/index.html>

Implication of Inter-Firm Networks for Theories of Production and Trade

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Rieti Policy Symposium, Tokyo

8 March 2016

Step Back

- Before confronting buyer-supplier networks ...
- ... consider other hurdles that we've overcome

Progress in Modeling Trade

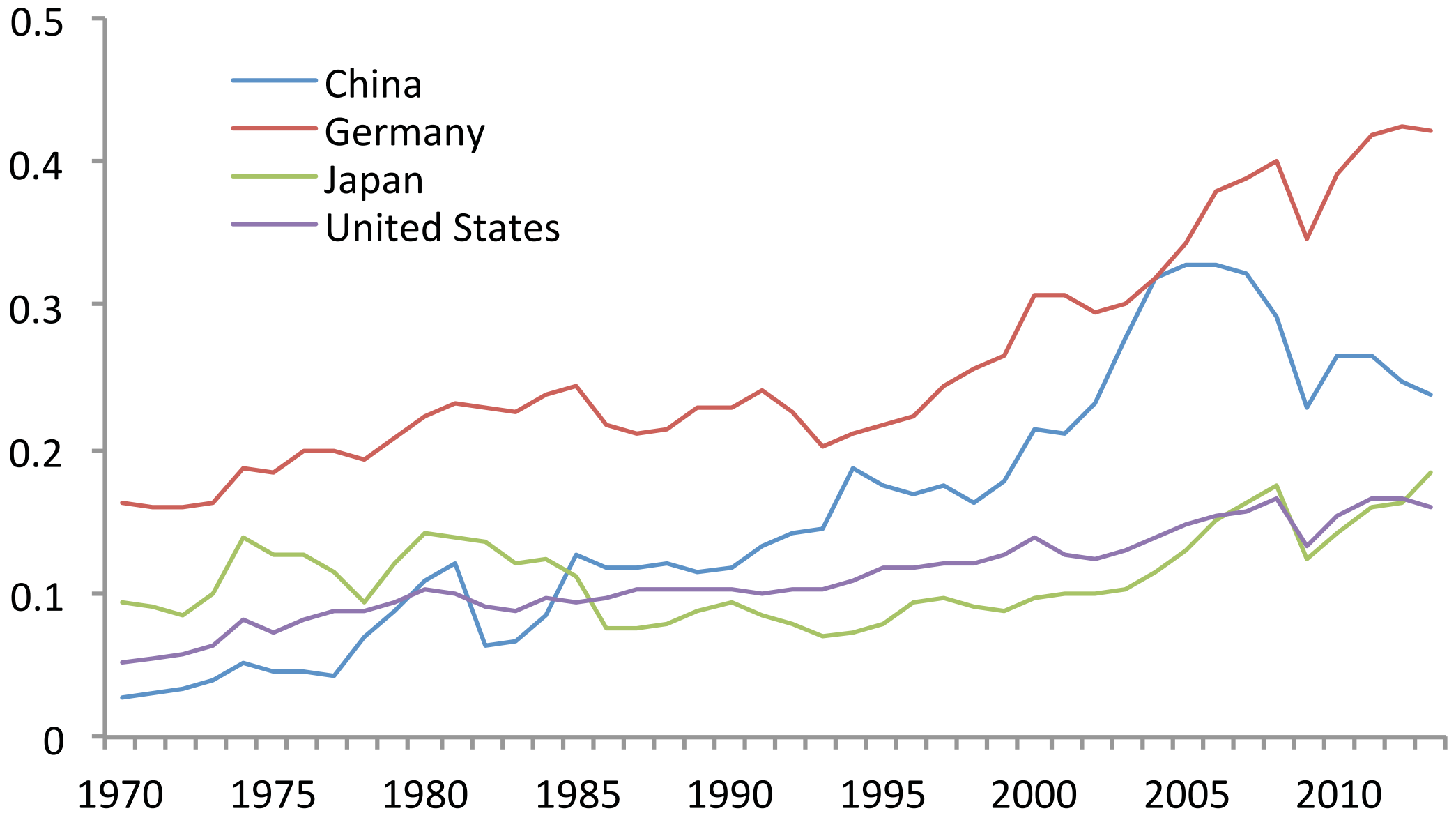
- Differentiated products to explain 2-way trade: Krugman
- “Iceberg costs” to handle geography: Samuelson; Fujita, Krugman, and Venables
- Heterogeneity to capture comparative advantage: Eaton and Kortum
- Producer-level evidence to challenge theories: Bernard and Jensen
- Producer-level theories to reconcile: BEJK, Melitz

Gains from Trade

- During this time of progress in modeling international trade ...
- ... the volume of trade went up relative to other activities
- World experienced increased gains from trade
- Could measure them with a simple formula ...
- ... involving ratio of home sales to absorption: Arkolakis, Costinot, and Rodríguez-Clare

Figure 1

- For major countries of the world
- In the aggregate:
- $(\text{imports of goods and services}) / (\text{GDP less net exports})$
- Source: United Nations National Accounts Statistics



A Connection?

- Not really!
- Progress in modeling was not due to a changing world
- It was about:
 - modeling the world more closely to how it actually is
 - measuring features of it that were previously ignored
 - embedding those features into our general-equilibrium structure

Shortcomings

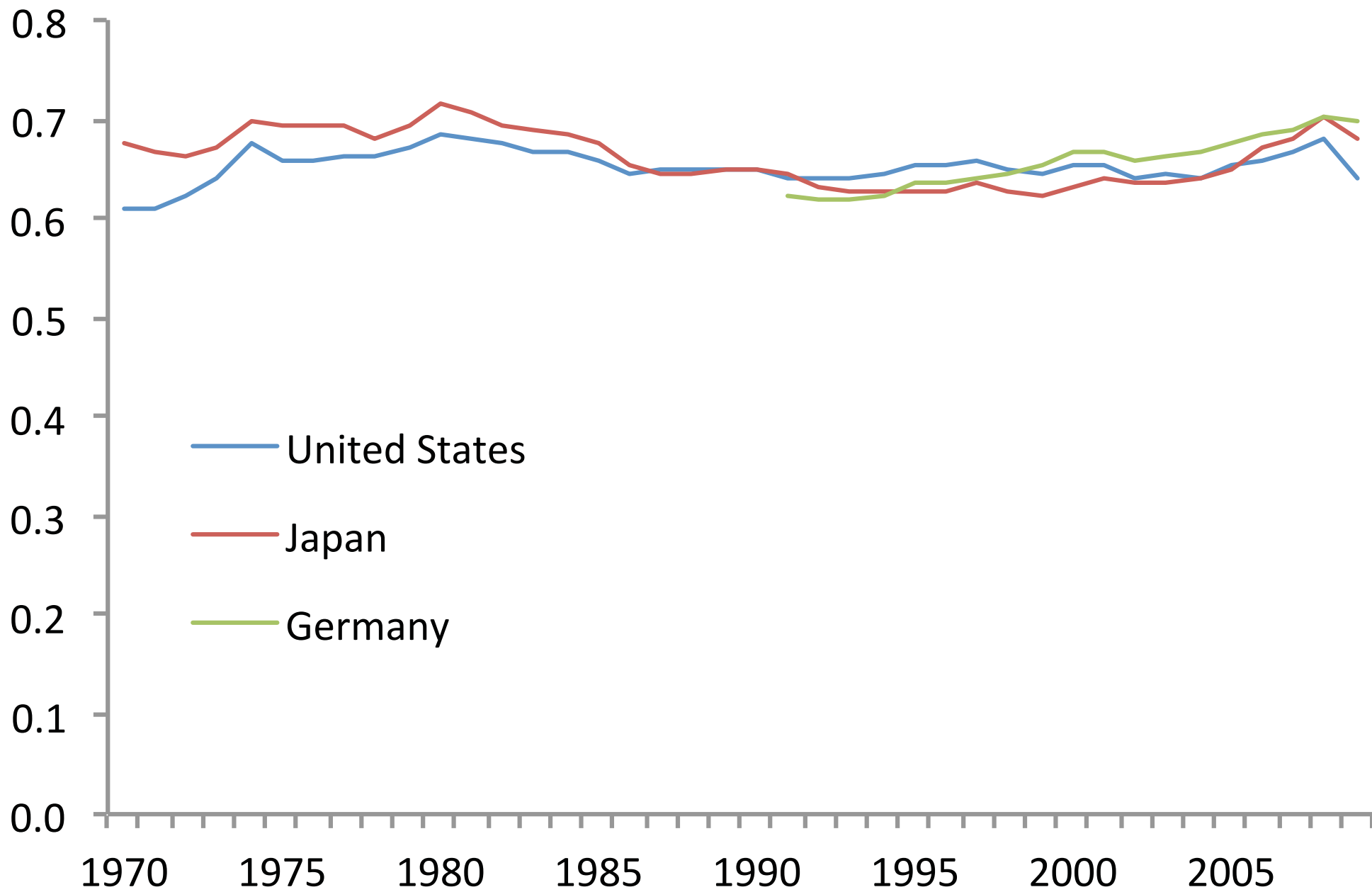
- Can't be smug: still much to cause embarrassment
- Iceberg costs must be unbelievably large
 - Stand in for information frictions?
- Heterogeneity is as prevalent on the buyer side as on the producer side
- Theory of importers doesn't mesh with theory of exporters

Buyer-Supplier Networks I

- In the aggregate these networks generate trade in intermediates ...
- ... as emphasized by Krugman and Venables; Yi
- and show up as input-output relationships ...
- ... as built into the trade model of Caliendo and Parro
- During this time of progress in modeling intermediates and trade ...
- ... the volume of intermediates didn't rise relative to production

Figure 2

- For major countries except China (Germany only post-unification)
- For the manufacturing sector:
- (intermediates) / (gross production)
- Source: OECD STAN



Buyer-Supplier Networks

- Now, we're getting measures of these networks at the micro level
- Nothing new: just a feature of the world we previously didn't confront
- Much richer than the input-output table
- Starting to build theories to explain what we see

Get at those Shortcomings

- Network indicates granularity on the demand side, matching that on the supply side
- Cries out for a unified model of exporters and importers
 - as pursued in Eaton, Kortum, and Kramarz
- Suggests informational frictions could be first order, reducing dependence on icebergs
 - as pursued in Bernard, Moxnes, and Saito

Boundaries of the Firm

- What tasks get done in-house and which are outsourced to other firms?
- What is the firm's value added?
- What jobs remain?
- What types of labor skills are still demanded?
- ... these questions are all relevant even without international trade

International Trade and the Network

- Analogy of a country shedding tasks and a firm shedding tasks
 - Country: imports increasingly dominate absorption (fig 1)
 - Firm: intermediates don't increasingly dominate production (fig 2)
- Why do we see the first but not the second?
- Gives us a more subtle view of how international trade impinges on individual workers

Goods Flows or Knowledge Flows

- So far its about goods moving from one firm to another
- Could also be about ideas moving from one brain to another: Lucas, Lucas and Moll
- Or a hybrid of the two: Oberfield
- Ultimately would like to link the good flows and knowledge flows: Buera and Oberfield
- ... to explain deeper implications of country openness