Accounting for Firm Heterogeneity within U.S. Industries: Extended Supply-Use Tables and Trade in Value Added using Enterprise and Establishment Level Data

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Outline

• Motivation
• Data sources
• Methodology of extended SUTs
• Results: TiVA and firm heterogeneity
  – Evidence of heterogeneity in components of output
  – Foreign ownership relevant for value added share of exports in some industries
• Conclusion and next steps
Motivation

Fragmentation in production

Intraindustry heterogeneity in the literature

Productivity Sorting (Melitz (2003))

Evidence of heterogeneity (e.g. Zeile (1998), Helpman, Melitz, and Yeaple (2004))

U.S. Japan

China Germany
Dimensions of firm heterogeneity

- Dimensions: Ownership, Export orientation, Import orientation, Firm size class

- OECD “possible” breakdown of columns and rows for each industry in extended supply use table (SUT)

- Experimental approach
  - Focus on MNE breakout

- Microdata linking
  - Expanded to export orientation and firm size class in current work
  - Will consider import orientation and other possible criteria in long-run research

Data for extended SUTs

• BEA SUTs based mainly on
  – Economic Census
  – Census and BEA trade data

• BEA AMNE data for MNE breakout

• Experimental tables (2005 and 2012)
  – Combines SUTs and AMNE data at the industry level

• Microdata linking (Semiconductor industry 2012)
  – Combines underlying firm level AMNE, establishment level Census of Manufactures, and trade data at the firm level
Incorporation of AMNE data

• Use two types of AMNE data
  – U.S. parent firms
  – Majority-owned U.S. affiliates of foreign parent firms

• Foreign MNEs=Majority-owned U.S. affiliates

• U.S. MNEs=U.S. parents less majority-owned U.S. affiliates (that are also U.S. parents)

• Employment based enterprise to establishment conversion matrix

• Non-MNE = SUT less MNE data for 30 industries
Input-output accounting

• Converted use table from purchaser prices to basic prices
• Converted ESUTs to input-output tables
• TiVA indicators using Leontief inverse
• TiVA indicators
  – Typically decompose trade or final demand on a value added basis
  – Focus on import content and domestic value added in exports
Import content as a share of exports

2012  2005

Food, beverage, & tobacco
Petroleum manufacturing
Paper
Chemicals
Plastics & rubber
Nonmetallic minerals
Primary metals
Fabricated metals
Machinery
Computers & electronics
Electrical equipment
Motor vehicles
Other manufacturing
Wholesale trade
Retail
Publishing
FIRE
Telecom & other information
Computer systems design services
Management, scientific, & technical services
Utilities & construction
Transportation
Health care
Accommodation & food services
Other industries
Government
Import content as a share of exports

Computers and Electronics-2005 and 2012

Billions of $

2005 2012
Non-MNE Non-MNE U.S. MNE U.S. MNE Foreign MNE Foreign MNE

By firm type

All firms

Domestic value added Imported content
Import content as a share of exports by firm type
Source of content in exports, 2012
Value added share of gross output

Semiconductor Industry-Value added-2012

- Foreign MNE
- Non-MNE
- U.S. MNE
- Small enterprise
- Large enterprise
- Medium enterprise
- Non-exporter
- Exporter
Export share of gross output

Semiconductor Industry-Exports-2012

- Non-MNE
- U.S. MNE
- Foreign MNE
- Small enterprise
- Medium enterprise
- Large enterprise
- Non-exporter
- Exporter
Summary

• Accounting for heterogeneity by ownership looks most promising and is theoretically grounded

• Better understanding of role of firm types in global and domestic value chains in the U.S.

• For semiconductors, no one firm type best accounts for heterogeneity in all aspects of production
Next steps

• Enhancements to supply-use tables
  – Consider publication of SUT sub-matrices used in TiVA calculations

• Expand BEA-Census microdata link project beyond semiconductors

• Work with other countries to reconcile bilateral asymmetries in source data

• APEC initiative and North America Regional SUTs
  – Regional SUTs projected by end of 2018