Highlights and Challenges of Measuring Global Production

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Outline

- Highlights of measuring global production
  - Trade in Value Added
  - Accounting for firm-level heterogeneity with extended supply-use tables
  - Microdata link project
- Challenges in measuring global production
  - Need for big (linked) data sets
  - Prices and volumes
  - Factoryless goods producers
  - Multinational enterprises
- Conclusion and way forward

Trade in Value Added

- Increased need to assess impacts of globalization/global value chains (GVCs) on national economies

- One approach to measurement:
  - Trade in Value Added (TiVA)
  - OECD has taken the lead
  - Other international groups (UN, APEC, NA-TiVA group) also engaged

- Requires global supply-use tables
  - National tables linked together through bilateral international trade flows

Supply Use Tables

- Challenges to the TiVA approach:
  - Building a global supply-use table
    - Different input-output format
    - Valuation differences
    - Industrial classification
    - Trade asymmetries
  - Accounting for firm-level heterogeneity (differences in the production functions of firms within an industry classification)

Highlights—dimensions of firm heterogeneity

BEA approach

Table 2: ' Ideal' breakdown of columns and rows in SU tables

Foreign Owned												Domestically owned MNE												Domestic Owned											
With high Export orientation 'Exporters'						With low Export orientation 'Non-Exporters'						With high Export orientation 'Exporters'						With low Export orientation 'Non-Exporters'						With high Export orientation 'Exporters'						With low Export orientation 'Non-Exporters'					
Low import orientation			High import orientation			Low import orientation			High import orientation			Low import orientation			High import orientation			Low import orientation			High import orientation			Low import orientation			High import orientation			Low import orientation			High import orientation		
S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L

Source: OECD Expert Group on Extended Supply-Use Tables: Terms of Reference

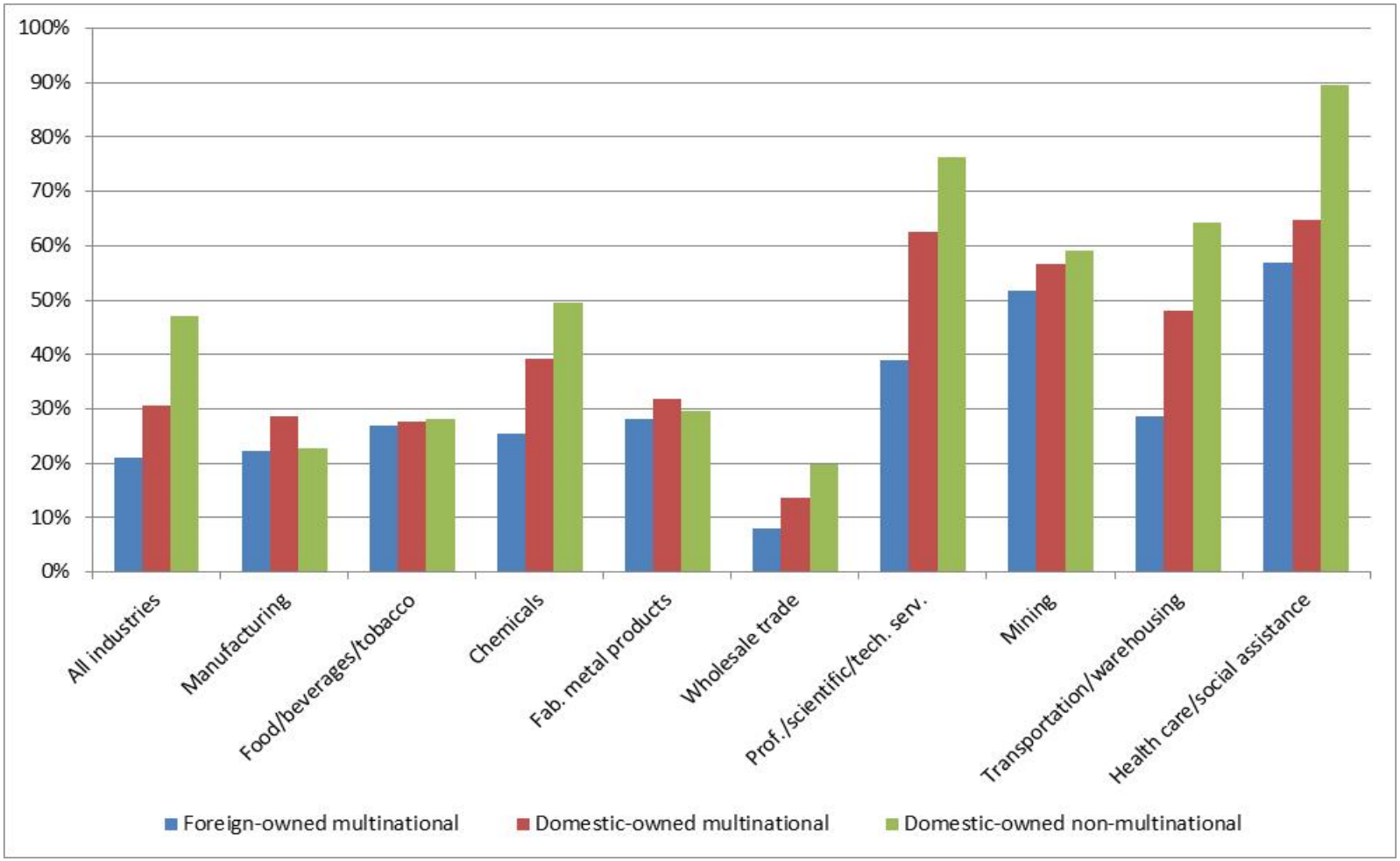
Highlights—proof of concept for United States

- Tabulations from tax returns for all U.S. firms
- BEA data on activities of multinational enterprises (AMNEs)
- Data from Supply-Use tables (SUTs)
  - Decompose production components gross output
    - Domestic and imported intermediates
    - Components of value added
  - Globally-engaged MNEs and entirely domestic firms
    - Working paper: http://bea.gov/papers/working_papers.htm
    - Research spotlight: http://www.bea.gov/scb/toc/0516cont.htm

Highlights—extended SUTs and trade in value Added

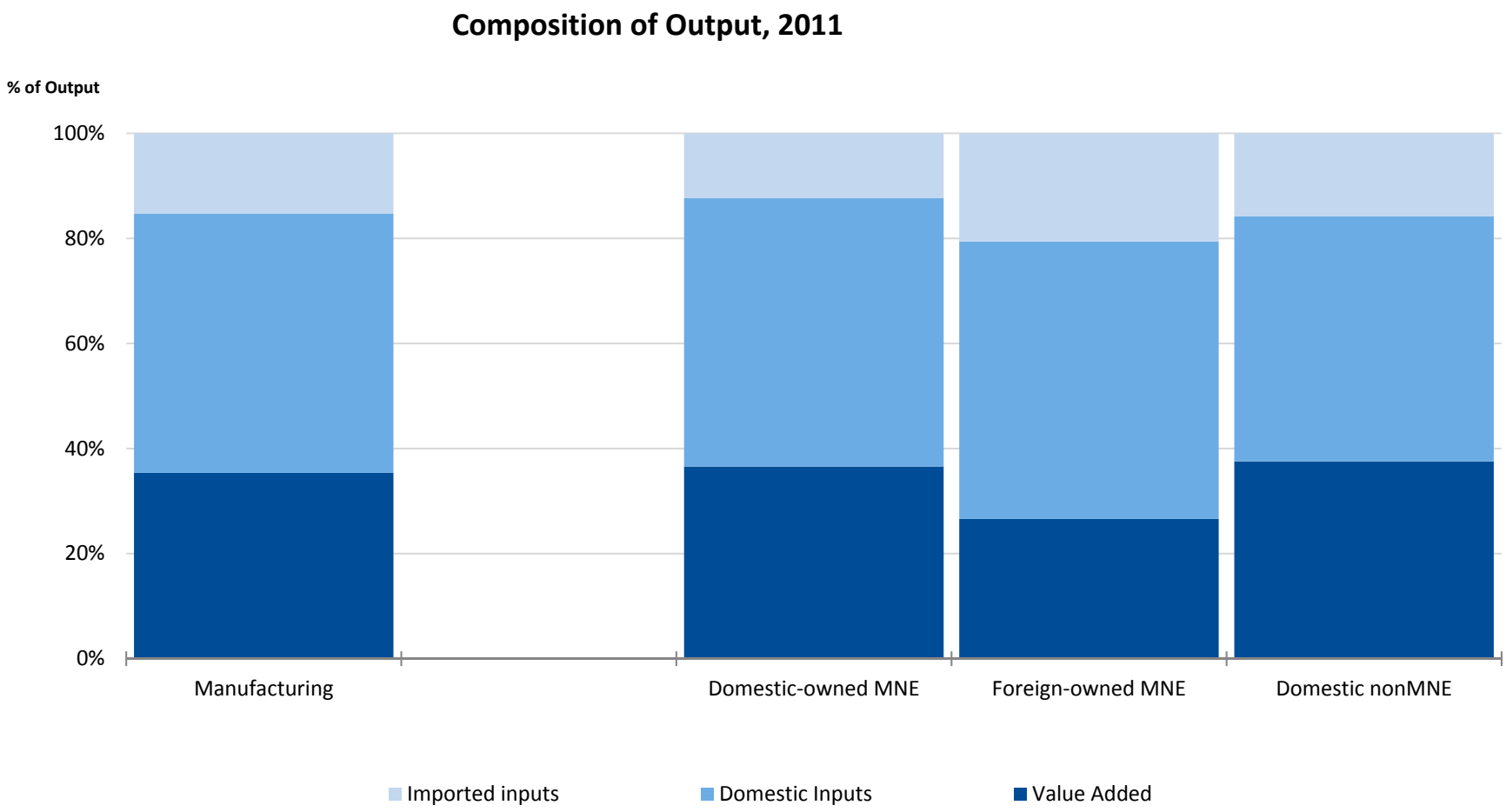
- Merge firm heterogeneity project with U.S. SUTs
- Incorporate modeling on basic price valuation
- Produce extended SUTs with heterogeneity for 33 industries and 35 products; develop associated TiVA indicators
  - Fetzer, Howells III, Jones, Strassner, Wang "Estimating Extended Supply-Use Tables in Basic Prices with Firm Heterogeneity for the United States: A Proof of Concept": http://scholar.harvard.edu/files/jorgenson/files/4a.1_paper.pdf
  - Next paper: "Accounting for Firm Heterogeneity in US Industries: Extend Supply-Use Tables and Trade in Value Added using Enterprise and Establishment Level Data (March 2018, NBER CRIW "Globalization" conference).

Firm-level heterogeneity: value added as a share of output, selected industries 2011



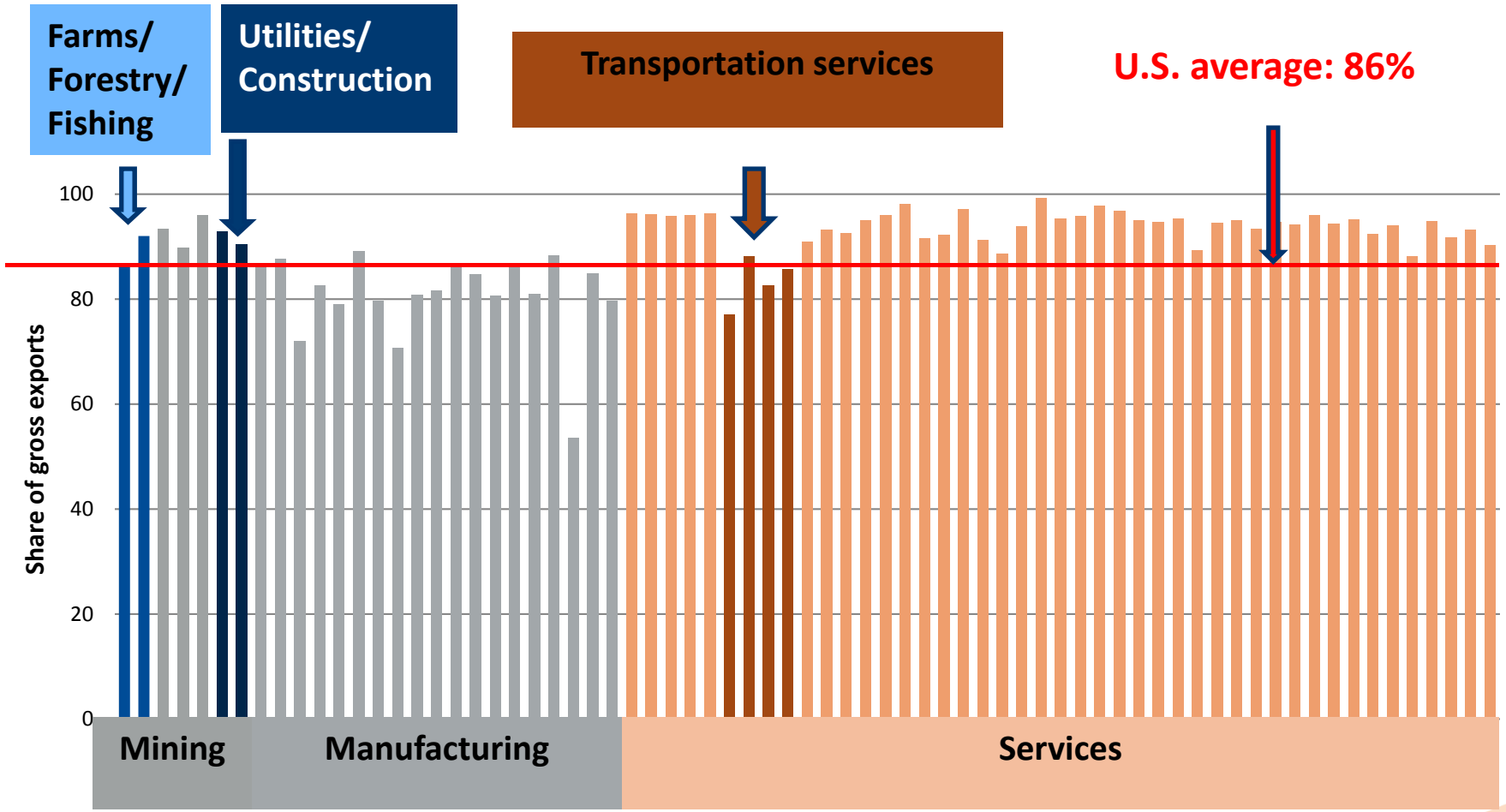
Source: James J. Fetzer and Erich H. Strassner, ''Identifying Heterogeneity in the Production Components of Globally Engaged Business Enterprises in the United States,'' BEA working paper (WP2015-12).

Manufacturing with and without heterogeneity



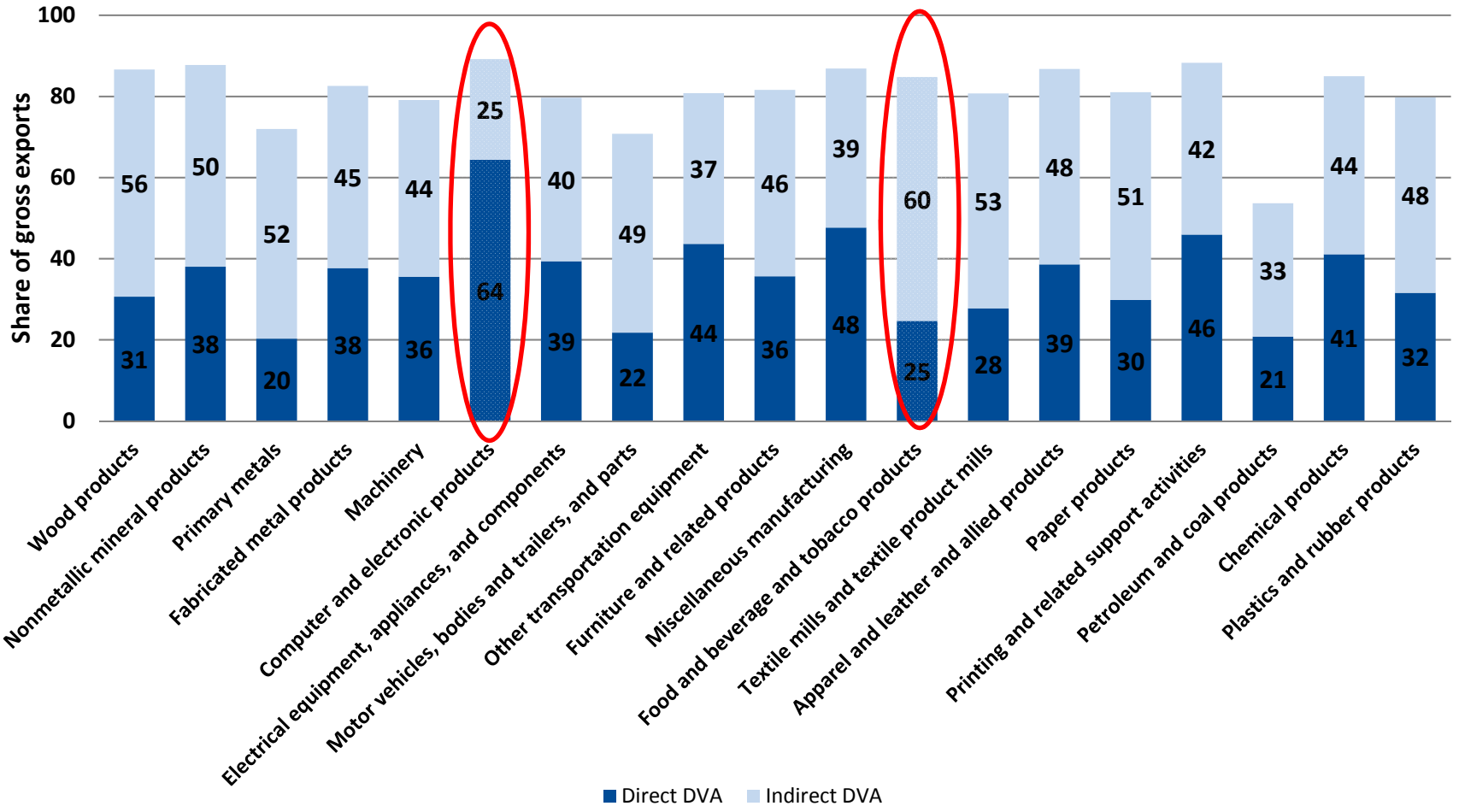
Fetzer, Howells III, Jones, Strassner, Wang (2016) "Estimating Extended Supply-Use Tables in Basic Prices with Firm Heterogeneity for the United States: A Proof of Concept"

Domestic value added share of U.S. gross exports by sector, 2011



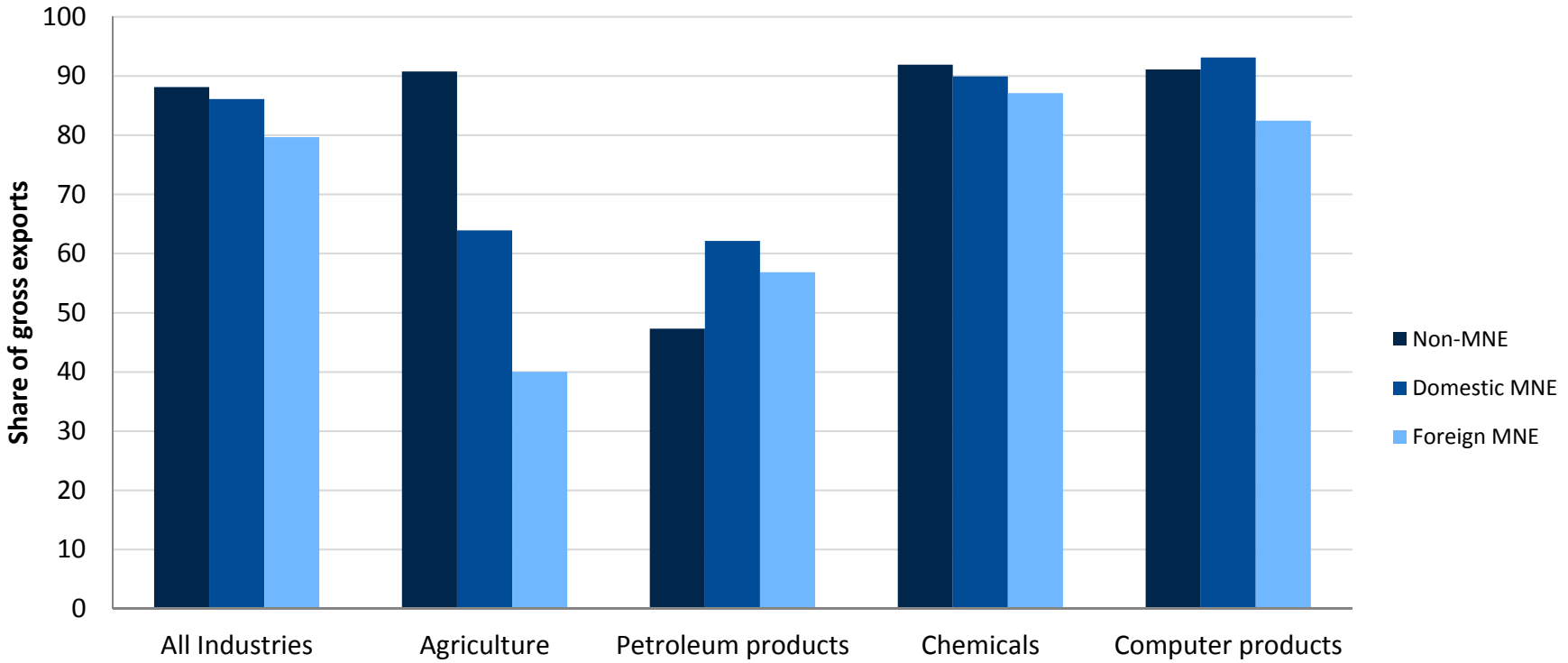
Fetzer, Howells III, Jones, Strassner, Wang (2016) "Estimating Extended Supply-Use Tables in Basic Prices with Firm Heterogeneity for the United States: A Proof of Concept"

Direct and indirect domestic value added share of U.S. gross exports for manufacturing, 2011



Fetzer, Howells III, Jones, Strassner, Wang (2016) "Estimating Extended Supply-Use Tables in Basic Prices with Firm Heterogeneity for the United States: A Proof of Concept"

Domestic value added share of gross exports with firm heterogeneity, 2011



Fetzer, Howells III, Jones, Strassner, Wang (2016) "Estimating Extended Supply-Use Tables in Basic Prices with Firm Heterogeneity for the United States: A Proof of Concept"

Firm-level heterogeneity: Long-run link project

- Data:
  - Census Bureau
    - Economic censuses and annual surveys
    - Trade in goods
  - BEA
    - AMNEs
    - Trade in services
- Five-year project started in April 2016
  - Links completed for 2007 through 2012, for both inward and outward investment
  - Semiconductor case study: major production variables complete by firm type and ownership

Challenges in measuring global production

- Requires “big data” sets to work off from
  - Enterprise statistics, size class data, establishment data, and trade data (among others) collected from…
  - Enterprise and MNE surveys, economic censuses and surveys, services trade surveys, administrative data, tax data, and customs records
  - Not all of this information is readily available so creativity is crucial
- May require adjusting institutional arrangements
  - Example: BEA/Census Bureau joint microdata link project
  - Redirect resources to generate better integrated enterprise and establishment data

Challenges in measuring global production

- Price measurement
  - Input versus output prices
  - Trade prices
- Factoryless goods producers
  - Identification at establishment level
  - Treatment of transactions
- Multinational enterprises
  - Transfer pricing
  - Structuring for purposes other than production

Conclusion and way forward

- Proof-of-concept analysis validates firm-level heterogeneity across industries
  - Although available data has limitations
  - Next step to develop extended tables for 2005 and 2012
- Microdata link
  - Complete case study and further tabulations between 2007 and 2012
  - Develop specification for an ongoing heterogeneity tabulation
- Development of complimentary globalization statistics worth pursuing despite the need for patience and creativity
- Expand research agenda for global production…much to do!

Questions and Discussion Points

Rethinking data collection mechanisms and processes:

- Current statistics are establishment oriented, but important decisions about things like investment in intangible capital and the location of production are made at the enterprise level.
  - How can we get better enterprise-based data without sacrificing too much of the establishment-based data?
  - How can we obtain better integrated enterprise and establishment data?
  - Should we consider rethinking establishments as the primary statistical unit for data collection?
- Developed economies have shifted from being primarily manufacturing oriented to being heavily services oriented, but data collections have not necessarily kept pace with this change.
  - What are the obstacles to shifting more resources toward services data collections, both in terms of domestic production and international trade?
  - How can we overcome institutional inertia that makes these changes difficult?