Evaluating Estimates of Materials Offshoring from U.S. Manufacturing

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World Bank
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Overview

• “Import Comparability” Assumption
  – When materials offshoring is measured by estimating imported intermediate inputs, it is assumed that an industry’s imports of each input, relative to its total demand, is the same as the economy-wide imports relative to total demand

• Examine two alternative approaches:
  – Feenstra and Hanson for Intermediates
  – Firm-level microdata
LFTTD

• Linked/Longitudinal Firm Trade Transaction Database
  – Transaction-Level Trade Data
    • Imports and exports
    • Ten-digit HS product traded
    • Value, quantity and date of shipment
    • Destination or source country
    • “Arm's length” vs “related party” transaction
  
  – Longitudinal Business Database (LBD)
    • Tax entity and enterprise identity information
  
  – For details, see Bernard, Jensen, and Schott (2009)
Economic Census Data

• Sectoral Censuses (e.g. manufacturing, retail)
  – Establishment level
  – Enterprise identifier
  – Industry classification

• Census of Manufactures Material Trailers
  – Material level
  – Establishment identifier
  – Detailed commodity classification
Microdata Approach

LFTTD – FirmID, HS10

CMF – FirmID, NAICS

IO commodities 3xx

Construct firm level input-output table then aggregate to manufacturing sector

CMF Mat Trl -- Commodity
Microdata Approach

LFTTD – FirmID, HS10

CMF – FirmID, NAICS

IO commodities 3xx

Construct firm level input-output table then aggregate to manufacturing sector

CMF Mat Trl -- Commodity

IO com. 1xx

IO com. 3xx

Single-unit firms and single industry multi-unit firms – all imported inputs allocated to single industry
Microdata Approach

LFTTD – FirmID, HS10

CMF – FirmID, NAICS

IO commodities 3xx

Construct firm level input-output table then aggregate to manufacturing sector

Multi-industry multi-unit firms which reported imports for which no material trailer record was found – imports allocated across industries based on industry’s share of firm’s shipments
Microdata Approach

LFTTD – FirmID, HS10

CMF – FirmID, NAICS

IO commodities 3xx

Construct firm level input-output table then aggregate to manufacturing sector

CMF Mat Trl -- Commodity

Multi-unit firms which reported imports for which material trailer record was found – imports allocated to industries that reported using the imported input (about 50% of value allocated this way)
Microdata Approach

LFTTD – FirmID, HS10

CMF – FirmID, NAICS

Exclude HS codes classified as “final goods”

IO com. 1xx

Construct firm level input-output table then aggregate to manufacturing sector

Exclude non-manufacturing estabs from multi-sector firms

IO com. 3xx

Wholesale/Retail

CMF Mat Trl -- Commodity
Unweighted distribution of share differences
Value-weighted distribution of share differences
### Comparison of Alt. Method to BEA IO Matrix

<table>
<thead>
<tr>
<th>3-digit IO Commodity Group</th>
<th>3-digit IO Industry Group</th>
<th>Alt. Share</th>
<th>BEA Share</th>
<th>Share Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>337 Furniture and Related Products</td>
<td>337 Furniture and Related Products</td>
<td>0.50</td>
<td>0.01</td>
<td>0.50</td>
</tr>
<tr>
<td>324 Petroleum and Coal Products</td>
<td>324 Petroleum and Coal Products</td>
<td>0.82</td>
<td>0.34</td>
<td>0.48</td>
</tr>
<tr>
<td>315 Apparel</td>
<td>316 Leather and Allied Products</td>
<td>0.46</td>
<td>0.00</td>
<td>0.46</td>
</tr>
<tr>
<td>326 Plastics and Rubber Products</td>
<td>326 Plastics and Rubber Products</td>
<td>0.56</td>
<td>0.18</td>
<td>0.38</td>
</tr>
<tr>
<td>323 Printing and Related Support Activities</td>
<td>334 Computer and Electronic Products</td>
<td>0.38</td>
<td>0.01</td>
<td>0.37</td>
</tr>
<tr>
<td>316 Leather and Allied Products</td>
<td>316 Leather and Allied Products</td>
<td>0.61</td>
<td>0.26</td>
<td>0.35</td>
</tr>
<tr>
<td>325 Chemicals</td>
<td>325 Chemicals</td>
<td>0.73</td>
<td>0.46</td>
<td>0.28</td>
</tr>
<tr>
<td>335 Electrical Equipment and Components</td>
<td>335 Electrical Equipment and Components</td>
<td>0.40</td>
<td>0.20</td>
<td>0.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3-digit IO Commodity Group</th>
<th>3-digit IO Industry Group</th>
<th>Alt. Share</th>
<th>BEA Share</th>
<th>Share Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>337 Furniture and Related Products</td>
<td>321 Wood Products</td>
<td>0.06</td>
<td>0.98</td>
<td>-0.92</td>
</tr>
<tr>
<td>114 Fishing, Hunting, and Trapping</td>
<td>311 Food</td>
<td>0.18</td>
<td>1.00</td>
<td>-0.82</td>
</tr>
<tr>
<td>323 Printing and Related Support Activities</td>
<td>323 Printing and Related Support Activities</td>
<td>0.12</td>
<td>0.73</td>
<td>-0.62</td>
</tr>
<tr>
<td>311 Food</td>
<td>312 Beverage and Tobacco Products</td>
<td>0.00</td>
<td>0.36</td>
<td>-0.36</td>
</tr>
<tr>
<td>324 Petroleum and Coal Products</td>
<td>325 Chemicals</td>
<td>0.13</td>
<td>0.46</td>
<td>-0.32</td>
</tr>
<tr>
<td>316 Leather and Allied Products</td>
<td>314 Textile Products</td>
<td>0.00</td>
<td>0.22</td>
<td>-0.22</td>
</tr>
<tr>
<td>316 Leather and Allied Products</td>
<td>323 Printing and Related Support Activities</td>
<td>0.00</td>
<td>0.22</td>
<td>-0.22</td>
</tr>
</tbody>
</table>

Note: This table lists the 3-digit IO Commodity IO Industry cells with the largest share differences (both positive and negative). The table lists 8 of the top 10 positive differences and 7 of the top 10 negative differences. The remaining cells were suppressed to prevent disclosure.
Identifying Firm Types

- We group firms into five, mutually exclusive types according to their employment in wholesale/retail versus other sectors

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Pure Wholesaler</td>
<td>100% Wholesale</td>
</tr>
<tr>
<td>R</td>
<td>Pure Retailer</td>
<td>100% Retail</td>
</tr>
<tr>
<td>PC</td>
<td>Pure “Producer-Consumer”</td>
<td>0% Wholesale, Retail</td>
</tr>
<tr>
<td></td>
<td>(hypothetical “trading firm”)</td>
<td></td>
</tr>
<tr>
<td>MWR</td>
<td>Mixed Wholesaler-Retailer</td>
<td>75%&lt;Wholesale+Retail&lt;100%</td>
</tr>
<tr>
<td>MPC</td>
<td>Mixed “Producer-Consumer”</td>
<td>Wholesale+Retail&lt;75%</td>
</tr>
</tbody>
</table>

Source: Bernard, Jensen, Redding, Schott (2010)
### Distribution of Trading Firms by Type

<table>
<thead>
<tr>
<th>Firm Type</th>
<th>Exporting Firms</th>
<th>Importing Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Share of Firms</td>
<td>Share of Export Value</td>
</tr>
<tr>
<td>W</td>
<td>0.34</td>
<td>0.08</td>
</tr>
<tr>
<td>R</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>PC</td>
<td>0.52</td>
<td>0.22</td>
</tr>
<tr>
<td>MWR</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>MPC</td>
<td>0.04</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Source: Bernard, Jensen, Redding, Schott (2010)
Conclusions

• This stuff is hard...

• And confusing....
  – How to think about firms with manufacturing operations importing products coded to their industry
    • Are these “final goods” or “intermediate inputs”?
  – How to think about firms importing products they don’t report using
    • Are these “final goods” or “intermediate inputs”?

• Need to better understand the role of large, multi-activity firms
  – Role of manufacturing and wholesale/retail operations

• Services?
Thank you