Reinterpreting the U.S.-China Manufacturing Trade Deficit

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Road map

• Importance of trade for U.S.
  – Large and growing U.S. trade deficit
  – Dependence on imports from China

• Measuring trade flows in global supply chains
  – *Double counting* of intermediate goods
  – Where *value-added* takes place

• Reinterpret U.S.-China trade deficit
  – Interdependence smaller than we think
Background

• Increased globalization and use of global supply chains
  – Trade relationships are far more complex
• U.S. manufacturing *disappearing*
• Need to look at data differently
  – Less dependent on China than we thought
Global supply chains

• Companies are increasingly breaking down production processes and relocating to cost-effective locations
• China, “factory of the world,” is a key link in international production chains
• Position on the supply chain matters
• Trade data should also track what and where value is added for each production step
Economic activity in the U.S. manufacturing sector

Produced and consumed in the U.S.
Economic activity in the U.S. manufacturing sector

Trade deficit: $326 billion

Produced and consumed in the U.S.
China accounts for a large and growing share of the U.S. trade deficit.

China’s share in the U.S. trade deficit:
- 1992: 12%
- 2011: 58%
Measuring trade flows in global supply chains: conventional approach

A U.S. consumer purchases an iPhone for $500: How are trade flows recorded?

- China imports intermediate goods from the U.S. and other countries
  - Imports $11 in goods from the U.S.
  - Imports $162 in goods from the rest of the world
Measuring trade flows in global supply chains: conventional approach

A U.S. consumer purchases an iPhone for $500: How are trade flows recorded?

- China assembles and exports the iPhone to the U.S. for $180
Measuring trade flows in global supply chains: conventional approach

A U.S. consumer purchases an iPhone for $500: How are trade flows recorded?

- iPhone is purchased by a U.S. consumer for $500
Measuring trade flows in global supply chains: conventional approach

A U.S. consumer purchases an iPhone for $500: How are trade flows recorded?

• The transaction yields a trade deficit between U.S. and China
• Implied gross trade deficit b/w U.S. and China: $180 - $11 = $169
Value added in production

• Change in the value of an article during a stage of production

• Example: Assembling an iPhone
  – Value of assembled iPhone: $180
  – Intermediate inputs: Processor, memory, Bluetooth, etc.: $162 + $11 = $173
  – Assembly using physical capital and labor: $7
Why does the position in the global supply chain matter?

• U.S. and China are on different ends of global supply chain
  – Intermediate inputs are *double-counted* at each stage of production
  – Beginning of supply chain, *high* value-added
  – End of supply chain, *low* value-added
The U.S. and China are on different ends of the global supply chain

<table>
<thead>
<tr>
<th>Imports</th>
<th>U.S.</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final manufactured goods</td>
<td>58%</td>
<td>29%</td>
</tr>
<tr>
<td>Intermediate manufactured goods</td>
<td>42%</td>
<td>71%</td>
</tr>
</tbody>
</table>
The U.S. and China are on different ends of the global supply chain

- **Imports**
  - U.S.: 42%
  - China: 29%

- **Exports**
  - U.S.: 54%
  - China: 39%
Where is value being added?

Share of value-added relative to gross manufacturing

- U.S.: 36%
- China: 23%
Measuring trade flows in global supply chains: value-added approach

A U.S. consumer purchases an iPhone for $500: How is the value-added distributed?

Recording the transaction in gross terms

Trade in intermediate goods gets repatriated to original source
Measuring trade flows in global supply chains: value-added approach

A U.S. consumer purchases an iPhone for $500: How is the value-added distributed?

Recording the transaction in gross terms

Trade in intermediate goods gets repatriated to original source

A U.S. consumer purchases an iPhone for $500.

- The assembled product is valued at $180.
- The memory and audio components are valued at $11.
- The processor, camera, etc., are valued at $162.
- The assembly is valued at $7.

The value-added is distributed as follows:

- USA
  - Assembled product: $180
  - Memory and audio: $11
  - Assembly: $7

- CHN
  - Processor, camera, etc.: $162

The transaction is recorded in gross terms, and the value-added is distributed accordingly.
Measuring trade flows in global supply chains: value-added approach

A U.S. consumer purchases an iPhone for $500: How is the value-added distributed?

Recording the transaction in gross terms

Remaining value of the iPhone sale covers distribution, R&D, and other value-added by Apple

Sale to consumer

Distribution, R&D, etc.

Remaining value of the iPhone sale

$162

$320

$500

$180

$11

$162

$7

$320

$11

$7

Assembled product

Processor, camera, etc.

Assembled product

Processor, camera, etc.

$500

Memory and audio

Memory and audio

USA

CHN

ROW

USA

CHN

ROW
Measuring trade flows in global supply chains: value-added approach

A U.S. consumer purchases an iPhone for $500: How is the value-added distributed?

Recording the transaction in gross terms

Sale to consumer $500

USA

CHN

Memory and audio $11

$162

Processor, camera, etc.

ROW

Implied gross trade deficit b/w U.S. and China: $169

Recording the transaction in value-added terms

Distribution, R&D, etc. $320

Processor, camera, etc.

ROW

$162

Memory and audio

$11

$7

Assembly

USA

CHN

Assembled product $180

$162

$7

Implied value-added trade deficit b/w U.S. and China: $7
U.S.-China manufacturing trade deficit in value-added terms

Percent of U.S. GDP

Gross deficit  Value-added deficit

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross Deficit</th>
<th>Value-added Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0.63</td>
<td>0.31</td>
</tr>
<tr>
<td>2005</td>
<td>1.48</td>
<td>0.62</td>
</tr>
<tr>
<td>2009</td>
<td>1.53</td>
<td>0.65</td>
</tr>
</tbody>
</table>
Summary

• Conventional trade data suggest that U.S. is very dependent on imports from China
• Understanding global supply chain changes the picture
  – China specializes in low value-added at end of global supply chain: gross exports *inflated*
  – U.S. specializes in high value-added at beginning of supply chain
• U.S. not as dependent on China as suggested by conventional measures of trade
Implications

• Inflation in U.S.
  – How does wage growth in China affect prices in U.S.?
    • Chinese factors account for small share of value added

• Currency wars and policy
  – Should U.S. worry about a devaluation in Chinese yuan?
    • May not be strategically optimal for China: imports a lot of intermediates