Intra-Industry Trade in Europe

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Motivation

- Simultaneous exports and imports within industries between countries of similar development levels
- One of the most important empirical finding of the 1960s concerning international trade.
- Initially observed for the Benelux customs union.
- Thereafter for the 6 founding members of the EEC
- Then for the Single European Market
- Concentration of trade flows within industries rather than between industries: a recurrent pattern of the process of European integration
- What does it mean for policy making?
- What is the contemporary evidence?
Outline of the talk

- Introduction
- Related literature
- Methodology
- Main results
- Conclusion
Prevalence of IIT even using disaggregated classifications of products
  – Traditional theory of trade questioned.
  – New Trade Theory: IIT in horizontally differentiated products

Synthesis by Helpman and Krugman, 1985
  – IIT between similar countries
  – Inter-industry trade between different countries
  – … or due to agglomeration economies
  – "Love of Variety” versus specialisation in industries

Workhorse: gravity model (Bergstrand, 1990, Anderson & van Wincoop, 2004). Explaining trade volumes a.w.a. trade patterns
  – *Share* of IIT in bilateral trade is a decreasing function of differences in capital-labour endowment ratios
Trade patterns matter for economic policy

IIT: trade in different products, belonging to the same industry => production functions are the same => limited distributive impacts.

IIT => gains in variety => economies of scale

IIT <=> complete specialisation (on products): no FPE

Inter-industry trade: trade in products belonging to different industries

Specialisation => efficiency gains => adjustment costs & distributive impacts (Stolper-Samuelson).
EU integration: large gains and limited pains.

Specialisation and asymmetries within the monetary union
- If Single market encourages IIT, "one market" is complementary to "one money"
- Monetary integration impacts i) transaction costs 2) agglomeration 3) trade patterns
- Endogeneity of asymmetries

Conclusions challenged by studies looking at the completion of the Single market.

Prevalence of IIT-V
- Specialisation in vertically diff. varieties within industries
- Trade does overlap in products having different unit values.
Vertically versus horizontally differentiated: does it make a difference?

Determinants of IIT in horizontally differentiated products are different from those in vertical differentiation.

Consequences differ too.

Limited substitution between varieties traded within categories limits the impact of trade on labour market?

Displacement of factors being specific to some extent (incomplete portability of qualifications, sunk costs).

Specialisation in quality => asymmetries

Exch rate volatility => IIT-H (--) IIT-V (-) Inter-indus (+)

Hence monetary integration promotes firstly IIT-H
Related literature
From Dreze to Schott...

- Literature has replicated the initial results and...
- Has clarified methodological issues:
  - Aggregation effects (Grubel & Lloyd, 1975; Greenaway & Milner, 1986; Lloyd & Lee, 2002): bilateral + disaggregated
  - Variability of factor intensities within industries (Finger, 1975; Schott, 2003).
- Peculiar type of IIT to be envisaged: two-way trade of qualitatively differentiated products
- High quality varieties embody
  - More capital (Falvey, 1981; Falvey and Kierzkowski, 1987),
  - More qualified labour (Gabszewicz and Turrini, 1997)
... Matches new approaches: varieties + vert. diff° + multi-product heterogeneous firms

- Systematic finding of trade literature: considerable variation in unit values (UV) of traded products at the most detailed level of product classification.

- Japanese (UV) 1.43 times higher than for Brazil, 1.86 times higher than for India, and 2.86 times higher than for China.

- For the same products, shipped to the same markets, within the same year (2004).

- Evidence of a specialisation of countries within products and across varieties. Schott (2004)

- At the most detailed level of classification, UV of imports of US-Japan and the EU is a function of GDP per cap of exporter (Fontagné, Gaulier, Zignago 2007).
## Median relative unit values (2004)

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>China</th>
<th>Japan</th>
<th>Russia</th>
<th>India</th>
<th>USA</th>
<th>EU25</th>
<th>Oth. Em</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>.</td>
<td>0.81</td>
<td>1.43</td>
<td>1.00</td>
<td>0.96</td>
<td>1.16</td>
<td>1.48</td>
<td>1.04</td>
</tr>
<tr>
<td>China</td>
<td>1.23</td>
<td>.</td>
<td>2.86</td>
<td>1.17</td>
<td>1.25</td>
<td>2.44</td>
<td>3.06</td>
<td>1.43</td>
</tr>
<tr>
<td>Japan</td>
<td>0.70</td>
<td>0.35</td>
<td>.</td>
<td>0.75</td>
<td>0.54</td>
<td>1.00</td>
<td>1.08</td>
<td>0.70</td>
</tr>
<tr>
<td>Russia</td>
<td>1.00</td>
<td>0.85</td>
<td>1.34</td>
<td>.</td>
<td>1.13</td>
<td>1.26</td>
<td>1.36</td>
<td>1.08</td>
</tr>
<tr>
<td>India</td>
<td>1.04</td>
<td>0.80</td>
<td>1.86</td>
<td>0.89</td>
<td>.</td>
<td>1.58</td>
<td>2.05</td>
<td>1.07</td>
</tr>
<tr>
<td>USA</td>
<td>0.86</td>
<td>0.41</td>
<td>1.00</td>
<td>0.79</td>
<td>0.63</td>
<td>.</td>
<td>1.12</td>
<td>0.81</td>
</tr>
<tr>
<td>EU25</td>
<td>0.68</td>
<td>0.33</td>
<td>0.92</td>
<td>0.73</td>
<td>0.49</td>
<td>0.90</td>
<td>.</td>
<td>0.57</td>
</tr>
<tr>
<td>Oth. Em</td>
<td>0.96</td>
<td>0.70</td>
<td>1.43</td>
<td>0.92</td>
<td>0.93</td>
<td>1.23</td>
<td>1.77</td>
<td>.</td>
</tr>
</tbody>
</table>

Note: Median of relative unit values of country A (in column) and B (in line) across common HS6 positions and geographical destinations of exports.

Share of up-market varieties, in US imports from each exporter, by development level (GDP per capita relative to the US) of the exporter.
UV of exports is a function of GDP per cap

- Extend the empirical analysis on US imports by Schott (2004) by using a world sample
- Three comparable importers and the same disaggregation of the data: USA, EU and Japan
- Simple methodology: explain UV of each individual trade flow (exporter, importer, HS6 product, year) by PPP per capita GDP of exporter

\[
\ln UV_{i,hs6,t} = C_{hs6,t} + \beta \cdot \ln GDP_{PCi,t}.
\]

- Value added:
  - Select the products that are sourced simultaneously and significantly in the North and the South;
  - Consider the distribution of the estimated elasticity, by importing country (21,967 equations).
Impact of the level of development of the exporting country on the UV of products imported by the EU, Japan and USA (pooled data)

<table>
<thead>
<tr>
<th>Importer:</th>
<th>Estimated parameter</th>
<th>standard error</th>
<th>t</th>
<th>R²</th>
<th>N</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>0.378</td>
<td>0.002</td>
<td>182.41</td>
<td>0.0484</td>
<td>653,633</td>
<td>33,274</td>
</tr>
<tr>
<td>Japan</td>
<td>0.429</td>
<td>0.002</td>
<td>191.79</td>
<td>0.0796</td>
<td>425,242</td>
<td>36,782</td>
</tr>
<tr>
<td>EU (*)</td>
<td>0.352</td>
<td>0.001</td>
<td>501.37</td>
<td>0.0635</td>
<td>3,710,189</td>
<td>251,377</td>
</tr>
</tbody>
</table>

Methodology
Greenaway, Hine and Milner (GHM 1994, 1995) further decompose a Grubel and Lloyd (G&L) index.

Fontagné and Freudenberg (FF 1997, 1998) categorise trade flows and compute the share of each category in total trade.

Both methods rely on the same assumption regarding the association of price (unit values) with the quality of traded products.

- Bilateral trade at the product (HS6, NC8) level
- Threshold on relative unit values (+ - 15% / 25%)
- GHM: the balanced part of a bilateral trade flow is considered as IIT
- The two shares (resp. GHM-H and GHM-V) sum up to the G&L.
Men/boys shirts  Parts of computers

Inter-industry

M_US,Ch: Value of US imports from China
X_US,Ch: Value of US exports to China
## Trade types

<table>
<thead>
<tr>
<th>Degree of overlap between export and import values</th>
<th>Similarity of export and import unit values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the minority flow represent at least 10% of the majority flow?</td>
<td>Do export and import unit values differ by less than 25%?</td>
</tr>
<tr>
<td>Yes</td>
<td>Unit value not available</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Two-way trade in horizontally differentiated products</td>
<td>Two-way trade in vertically differentiated products</td>
</tr>
<tr>
<td>No</td>
<td>One way trade</td>
</tr>
</tbody>
</table>

**Methodology**
Comparison between (G&L) and (FF) for country pairs, 2000

Methodology
The data we need

- Full sample of countries going far beyond OECD: especially emerging economies
- At the most detailed level of the nomenclature of traded products (HS6), values, quantities.
- Based on COMTRADE, BACI aims at providing with a world trade matrix for values as well as quantities at the 6 digit level (1995-2004). FOB-FOB, reconciled.
- Examples of HS6 positions considered:
  - Gas/smoke analysis apparatus
  - Chromatographs, electrophoresis instruments
  - Spectrometers, spectrophotometers, etc using light
  - Exposure meters
  - Instruments nes using optical radiations
  - Equipment for physical or chemical analysis, nes
  - Microtomes, parts of scientific analysis equipment
  - Instruments to measure or detect ionising radiations
  - Cathode-ray oscilloscopes, oscillographs
Main results
Evolution 1989-2002 of the 3 trade types (% of world trade)
Trade types by country (2002)

One-way trade

Two-way trade in similar products

Two-way trade in vertically differentiated products

China
Thailand
Korea
Japan
Portugal
Ireland
USA
Italy
France
Germany

Results
The worldwide top ten bilateral IIT relations ranked by share and by value, 2000

<table>
<thead>
<tr>
<th>Country 1</th>
<th>Country 2</th>
<th>Share (in %)</th>
<th>Country 3</th>
<th>IIT Values (USD million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>France</td>
<td>86.20</td>
<td>USA</td>
<td>Canada</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Belgium and Lux.</td>
<td>85.01</td>
<td>USA</td>
<td>Mexico</td>
</tr>
<tr>
<td>France</td>
<td>Belgium and Lux.</td>
<td>80.42</td>
<td>Germany</td>
<td>France</td>
</tr>
<tr>
<td>France</td>
<td>United Kingdom</td>
<td>77.08</td>
<td>Italy</td>
<td>Germany</td>
</tr>
<tr>
<td>Germany</td>
<td>Switzerland</td>
<td>76.99</td>
<td>Netherlands</td>
<td>Germany</td>
</tr>
<tr>
<td>Germany</td>
<td>Belgium and Lux.</td>
<td>76.83</td>
<td>USA</td>
<td>Japan</td>
</tr>
<tr>
<td>Austria</td>
<td>Germany</td>
<td>76.63</td>
<td>Belgium and Lux.</td>
<td>France</td>
</tr>
<tr>
<td>France</td>
<td>Spain</td>
<td>76.55</td>
<td>Italy</td>
<td>France</td>
</tr>
<tr>
<td>Germany</td>
<td>Netherlands</td>
<td>76.01</td>
<td>Belgium and Lux.</td>
<td>Germany</td>
</tr>
<tr>
<td>Canada</td>
<td>USA</td>
<td>73.55</td>
<td>United Kingdom</td>
<td>Germany</td>
</tr>
</tbody>
</table>

Results
# Worldwide top ten bilateral IIT-H shares, 2000 (%)

<table>
<thead>
<tr>
<th>Country pairs</th>
<th>TWT-H</th>
<th>TWT-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>Spain</td>
<td>44.05</td>
</tr>
<tr>
<td>France</td>
<td>Germany</td>
<td>43.03</td>
</tr>
<tr>
<td>Belgium and Lux.</td>
<td>Netherlands</td>
<td>38.63</td>
</tr>
<tr>
<td>Belgium and Lux.</td>
<td>France</td>
<td>38.26</td>
</tr>
<tr>
<td>Belgium and Lux.</td>
<td>Germany</td>
<td>35.49</td>
</tr>
<tr>
<td>Austria</td>
<td>Germany</td>
<td>34.27</td>
</tr>
<tr>
<td>Germany</td>
<td>Netherlands</td>
<td>33.81</td>
</tr>
<tr>
<td>France</td>
<td>Italy</td>
<td>33.56</td>
</tr>
<tr>
<td>Germany</td>
<td>Spain</td>
<td>31.24</td>
</tr>
<tr>
<td>France</td>
<td>United Kingdom</td>
<td>30.79</td>
</tr>
</tbody>
</table>
# Worldwide top ten bilateral IIT-V shares, 2000 (%)

<table>
<thead>
<tr>
<th>Country pairs</th>
<th>TWT-H</th>
<th>TWT-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom USA</td>
<td>17.77</td>
<td>55.07</td>
</tr>
<tr>
<td>Germany Switzerland</td>
<td>24.28</td>
<td>52.67</td>
</tr>
<tr>
<td>Germany USA</td>
<td>19.32</td>
<td>51.23</td>
</tr>
<tr>
<td>Czech Republic Germany</td>
<td>22.41</td>
<td>50.46</td>
</tr>
<tr>
<td>Mexico USA</td>
<td>11.10</td>
<td>49.61</td>
</tr>
<tr>
<td>Switzerland United Kingdom</td>
<td>9.76</td>
<td>48.94</td>
</tr>
<tr>
<td>Ireland United Kingdom</td>
<td>23.13</td>
<td>46.35</td>
</tr>
<tr>
<td>Belgium Lux. Netherlands</td>
<td>38.63</td>
<td>46.28</td>
</tr>
<tr>
<td>Austria Switzerland</td>
<td>18.45</td>
<td>45.77</td>
</tr>
<tr>
<td>Malaysia Singapore</td>
<td>14.27</td>
<td>45.74</td>
</tr>
</tbody>
</table>
Conclusion

- New database, worldwide H6
- Method FF to disentangle two way trade in horizontally / vertically differentiated products
- IIT-V is a peculiar type of specialisation
- European pairs of Member states characterised by the largest IIT shares in the world
- This is even more true for IIT-H
- Fears of monetary integration leading to asymmetries exaggerated
- The big issue is now the increasing importance of trade with emerging economies: trade patterns characterised by specialisation.
- Stolper-Samuelson make a come-back