Trade and Foreign Direct Investment: New Empirical Results To Ponder

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Outline of Presentation

• Why do multinationals deserve any special attention?
• An illuminating fact about why these firms might be so deserving: the multinational wage premium.
  • Higher worker productivity due to superior capital and technology.
  • Profit sharing thanks to higher profits and cross-border links.
  • Compensating differential for higher job-separation risk.
  • Evidence consistent with all this: the prominent role of multinationals in the rise of global production networks.

• This wage fact illuminates several other new findings about multinationals that can hopefully inform ongoing research, both theoretical and empirical.
Why Focus on Multinationals?

• On the one hand, even in countries like the United States multinationals are a tiny fraction of all firms.
  • In the U.S. in 1999 there were 2,494 parents and 8,657 affiliates.
  • In the U.S. that same year there were 17,409,000 proprietorships; 1,855,000 partnerships; and 4,849,000 corporations (all non-farm).
  • So just 1/20th of 1% of all U.S. firms are part of a multinational.

• On the other hand, the rising share of multinationals in overall production and trade has been widely cited as a distinguishing feature of current globalization.
  • Over 1980s and 1990s, growth in cross-border flows of multinational capital have far exceeded flows of trade and people.
Why Focus on Multinationals?

• On a third hand, multinationals are notable in this globalization wave because they are so large and thus constitute such a large fraction of economic activity in so many countries.
  • In the U.S. in 1999, the multinational parents and affiliates employed 19.3% and 5.4%, respectively, of the total U.S. non-bank private-sector workforce.
  • In the U.S. in 1999, the multinational parents and affiliates generated 25.7% and 6.5%, respectively, of the total U.S. non-bank private-sector gross domestic product.

• Similar facts exist for countries in EU (e.g., Ireland) and elsewhere (e.g., Canada and Singapore).
The Multinational Wage Premium

• So beyond their size, what notable features of multinationals are worth considering?

• Consider this: that in a large number of countries—both developing and developed—multinationals pay higher wages than do comparable domestic firms.
  
  • Big magnitudes: e.g., 15% for U.S. production workers; 100+% in many developing countries.
  
  • The premium holds even controlling for a wide range of observable worker and/or firm characteristics.

• What accounts for this wage premium? Possible explanations illuminate different important features of multinational firms that we are learning about.
Story #1: Productivity Differentials

• The multinational wage premium could reflect higher worker productivity thanks to superior technology and/or capital (and thus activities, too, like trading).
  • U.S. multinational parents and affiliates performed 67.6% and 14.7%, respectively, of total 1999 U.S. private-sector R&D.
  • U.S. multinational parents and affiliates performed 30.5% and 11.8%, respectively, of total 1999 U.S. non-residential fixed I.
  • U.S. multinational parents and affiliates sent 58.3% and 22.1%, respectively, of total 1999 U.S. exports of goods.

• These numbers are staggering: multinationals account for 42.3% of U.S. investment, 80.4% of U.S. exports, and 82.3% of U.S. R&D—but 1/20th of 1% of firms.
Story #2: Profit Sharing

• The multinational wage premium could reflect the fact that these firms are more profitable and thus able to share more rents with workers.

• In labor economics, a large literature has documented a robustly positive correlation between wages for various micro-units with profits per worker at the level of that micro-unit’s firm and/or industry.

• Is there reason to think that the nature of profit sharing is different for multinational firms? Yes, for at least two reasons.
Story #2: Profit Sharing

• One reason may be that multinational firms are more profitable than their domestic counterparts.
  • This would accord with the facts that multinationals are more intensive in R&D, capital, and skilled workers.

• A second reason may be that multinationals share profits across borders between parent and affiliates.
  • Budd and Slaughter (2003) find that wages for Canadian affiliates of U.S. multinational parents vary with U.S. profitability.
  • Budd, Konings, and Slaughter (2002) find that for multinationals with parents and affiliates operating in Europe over the 1990s, affiliate wages vary with not just affiliate but also parent profits.
Story #3: Compensating Differential

• The multinational wage premium could reflect a compensating differential for the fact that working for a multinational rather than a domestic firm entails greater employment volatility.

• On the extensive margin, by virtue of operating in multiple countries, in any one country multinationals may be more inclined to close plants and/or entire operations in response to adverse developments.

• On the intensive margin, multinationals may have more-elastic labor demands.

• Theory discussions of all this include Rodrik (1997).
Story #3: Compensating Differential

- On the extensive margin, evidence that multinational plants are more likely to close than are domestically owned plants has now been documented for the manufacturing sectors in at least three countries.
  - Gorg and Strobl (2002) for Ireland.

- On the intensive margin, increased labor-demand elasticities are associated with multinationals.
An Illustration of These Stories: What U.S. Industry Is This?
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<table>
<thead>
<tr>
<th>Year</th>
<th>Exports as Share of Output</th>
<th>Net Exports as Share of Output</th>
<th>Imports as Share of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>-0.5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1970</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1980</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1990</td>
<td>1.5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2000</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Machinery</td>
<td>54.8</td>
<td>58.6</td>
<td>62.2</td>
</tr>
<tr>
<td>Electronics</td>
<td>73.2</td>
<td>66.6</td>
<td>77.6</td>
</tr>
<tr>
<td>Other Manufacturing</td>
<td>45.0</td>
<td>49.1</td>
<td>49.3</td>
</tr>
</tbody>
</table>

Notes: Cell entries report the share (in percentage terms) of each industry’s U.S. sales accounted for by the sale of goods of American companies with global operations whose main line of business is that relevant industry. Other manufacturing is all manufacturing less machinery and electronics.
An Illustration of These Stories: Rise of Vertical Production Networks

• The expansion of multinational firms has contributed to the dramatic recent growth in world trade.

• Multinationals increasingly create trade by setting up global *vertical production networks* (Feenstra, 1998).
  - In semiconductors, firms perform R&D in US, fabricate silicon wafers in Taiwan, and assemble chips in China.
  - In autos, firms produce high-end components in US and locate downstream tasks near markets in S. America, Asia, and Europe.
  - This *vertical specialization* accounts for one-third of recent growth in world trade (Hummels et al., 2001). Parts and components are responsible for 30% of world trade in manufactures (Yeats, 2001).
Vertical Production Networks

• We think of input trade within multinationals as one element of *vertical production networks*, within which parents and affiliates each perform a narrow (rather than broad) range of production activities linked by intra-firm input trade (a.k.a. “vertical FDI” in trade jargon).
  • Think automobile production in NAFTA countries.

• But the extent of vertical production networks varies substantially across both countries and industries.
  • Automobile production in NAFTA region versus in Mercosur.
  • Autos and electronics versus chemicals and non-metallic minerals.
## Regional Shares of Employment by Foreign Affiliates of US Multinational Firms

<table>
<thead>
<tr>
<th>Year</th>
<th>OECD</th>
<th>OECD</th>
<th>Mexico</th>
<th>Other</th>
<th>East</th>
<th>Middle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>62.7</td>
<td>7.3</td>
<td>6.4</td>
<td>12.4</td>
<td>7.3</td>
<td>2.9</td>
</tr>
<tr>
<td>1998</td>
<td>57.3</td>
<td>6.9</td>
<td>9.7</td>
<td>10.8</td>
<td>11.1</td>
<td>2.3</td>
</tr>
</tbody>
</table>
## Share of Imported Intermediate Inputs in Total Costs of U.S. Foreign Affiliates

<table>
<thead>
<tr>
<th>Industry</th>
<th>Region</th>
<th>World</th>
<th>OECD Europe</th>
<th>OECD Asia</th>
<th>Canada</th>
<th>Mexico</th>
<th>East Asia</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Manuf.</td>
<td>World</td>
<td>13.6</td>
<td>5.6</td>
<td>10.4</td>
<td>38.7</td>
<td>36.7</td>
<td>15.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Machinery</td>
<td>World</td>
<td>11.0</td>
<td>8.2</td>
<td>7.4</td>
<td>37.2</td>
<td>44.2</td>
<td>8.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Electronics</td>
<td>World</td>
<td>17.4</td>
<td>9.8</td>
<td>17.9</td>
<td>20.2</td>
<td>40.8</td>
<td>27.0</td>
<td>20.5</td>
</tr>
<tr>
<td>Transport Equip.</td>
<td>World</td>
<td>21.4</td>
<td>2.3</td>
<td>5.1</td>
<td>50.4</td>
<td>45.7</td>
<td>6.2</td>
<td>--</td>
</tr>
</tbody>
</table>
What Drives these Networks?

• Why do multinationals vertically fragment production?
  – International differences in wages.
    • In theory, firms prefer to locate labor-intensive tasks in low-wage countries, skill-intensive tasks in high-wage ones (Helpman, 1984).
    • But recent empirical work (see below) suggests that large local markets, not low wages, are what attract multinational firms.
  – Low import tariffs, transport costs.
    • In theory, low trade costs make back-and-forth trade feasible between parents and their foreign affiliates. This implies that small reductions in tariffs can boost trade by a large amount (Yi, 2003).
    • But recent empirical research suggests that tariffs raise FDI by inducing firms to replace exports with production abroad by foreign affiliates (Brainard, 1997; Carr, Markusen, and Maskus, 2001).
An Analysis of These Networks

• We use BEA firm-level data on U.S. multinationals to analyze a direct measure of vertical networks:
  • The demand for imported intermediate inputs for further processing by foreign affiliates in manufacturing in 1994.
  • We are able to measure the extent to which foreign affiliates specialize in processing inputs supplied by their U.S. parents.

• We estimate the sensitivity of demand for imported inputs to host-country trade costs, wages, taxes, etc.
  • Previous work uses aggregate data on multinationals and so may miss how production is organized in foreign affiliates.
Three Important Empirical Findings

• A key role for trade costs in vertical prod. networks.
  – Trade in imported intermediate inputs is greater where trade costs facing affiliates are lower.

• Sensitivity of vertical prod. networks to host wages.
  – Input trade is greater where wages for low-skilled workers are lower and wages for high-skilled workers are higher.

• Impact of other host policies, characteristics.
  – Input trade is greater where corporate tax rates are lower, free trade zones exist, and host countries are smaller.
Summary of Empirical Findings

• Where to locate processing of intermediate inputs?
  – Multinationals appear to prefer countries with abundant low-skilled labor, low trade costs, low corporate taxes, good access to the U.S., and small domestic markets.

• This is not the main message of much previous research, which emphasizes desire of multinationals to locate behind tariff walls to serve large local markets.

• As low-wage countries continue to lower trade barriers, we expect them to play a larger role in the vertical production networks of multinational firms.
Taking Stock: Some Conclusions

• Our research on vertical production networks highlights distinguishing features of multinationals that allow them to pay wage premiums.

• What accounts for this premium remains unknown, largely because the evidence is cross-sectional and thus likely reflect more than one of these stories.

• There are other prominent facts about multinationals that are worth mentioning as well.
  • Affiliate sales are far larger than exports (2000 U.S. parent exports were about $700B; 2000 U.S. affiliate sales were $2.891T).
  • Over 1990s, multinational capital became both the largest and most-stable inflow for many, many LDCs.
Taking Stock: Some Conclusions

- This body of evidence that nationality of ownership matters for firm characteristics and performance could better inform both modeling and empirics.
- The wage-premium stories suggest some possible refinements to allow modeling of multinationals.
  - Story #1: Different technology parameters (e.g., Hicks-neutral, or lower fixed costs to activities such as R&D and exporting).
  - Story #2: Different market power and thus profits.
  - Story #3: Different elasticities of substitution and exit rates.
- Other modeling issues include cross-firm linkages.
  - Is there technology transfer out of multinationals? Via spillovers? Should host countries care either way?
References


References


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References


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