Exports vs. Foreign Direct Investment (FDI)

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International Commerce and the World Economy

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Trade and FDI

Trade and FDI have been among fastest growing economic activities globally, e.g., in 2003:

(i) Merchandise exports, $7.3 trillion; (ii) Service exports, $1.8 trillion; (iii) FDI inflows, $560 billion

1990-2001, sales by foreign affiliates of multinational corporations (MNCs) expanded faster than exports of goods and services

Systematic relationship appears to exist between characteristics of firms and their participation in both foreign trade and investment
Trade and Firms

- Relatively little attention given in traditional trade models to firms that actually drive trade flows
- Exporting actually quite a rare activity – in 2000, of 5.5 million firms operating in US, only 4% engaged in exporting (Bernard et al., 2007)
- Even in industries more likely to be involved in exporting, manufacturing, mining and agriculture, only 15% of firms likely to be exporters
- More recent data from 2002 US Census of Manufactures confirms this (see table)
Table 1: Exporting by U.S. Manufacturing Firms, 2002

<table>
<thead>
<tr>
<th>NAICS Industry</th>
<th>Percent of Firms</th>
<th>Percent of Firms that Export</th>
<th>Mean Exports as a Percent of Total Shipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>311 Food Manufacturing</td>
<td>6.8</td>
<td>11.6</td>
<td>14.8</td>
</tr>
<tr>
<td>312 Beverage and Tobacco Product</td>
<td>0.7</td>
<td>22.9</td>
<td>7.4</td>
</tr>
<tr>
<td>313 Textile Mills</td>
<td>1.0</td>
<td>25.1</td>
<td>12.5</td>
</tr>
<tr>
<td>314 Textile Product Mills</td>
<td>1.9</td>
<td>12.2</td>
<td>11.7</td>
</tr>
<tr>
<td>315 Apparel Manufacturing</td>
<td>3.2</td>
<td>7.7</td>
<td>13.5</td>
</tr>
<tr>
<td>316 Leather and Allied Product</td>
<td>0.4</td>
<td>24.4</td>
<td>13.4</td>
</tr>
<tr>
<td>321 Wood Product Manufacturing</td>
<td>5.5</td>
<td>8.5</td>
<td>18.5</td>
</tr>
<tr>
<td>322 Paper Manufacturing</td>
<td>1.4</td>
<td>23.8</td>
<td>9.0</td>
</tr>
<tr>
<td>323 Printing and Related Support</td>
<td>11.9</td>
<td>5.5</td>
<td>14.4</td>
</tr>
<tr>
<td>324 Petroleum and Coal Products</td>
<td>0.4</td>
<td>17.8</td>
<td>11.5</td>
</tr>
<tr>
<td>325 Chemical Manufacturing</td>
<td>3.1</td>
<td>36.1</td>
<td>14.3</td>
</tr>
<tr>
<td>326 Plastics and Rubber Products</td>
<td>4.4</td>
<td>28.1</td>
<td>10.3</td>
</tr>
<tr>
<td>327 Nonmetallic Mineral Product</td>
<td>4.0</td>
<td>9.5</td>
<td>12.1</td>
</tr>
<tr>
<td>331 Primary Metal Manufacturing</td>
<td>1.5</td>
<td>30.2</td>
<td>10.4</td>
</tr>
<tr>
<td>332 Fabricated Metal Product</td>
<td>19.9</td>
<td>14.3</td>
<td>11.6</td>
</tr>
<tr>
<td>333 Machinery Manufacturing</td>
<td>9.0</td>
<td>33.0</td>
<td>15.5</td>
</tr>
<tr>
<td>334 Computer and Electronic Product</td>
<td>4.5</td>
<td>38.3</td>
<td>21.3</td>
</tr>
<tr>
<td>335 Electrical Equipment, Appliance,</td>
<td>1.7</td>
<td>37.7</td>
<td>12.9</td>
</tr>
<tr>
<td>Transportation Equipment</td>
<td>3.4</td>
<td>28.0</td>
<td>13.0</td>
</tr>
<tr>
<td>337 Furniture and Related Product</td>
<td>6.4</td>
<td>6.5</td>
<td>10.1</td>
</tr>
<tr>
<td>339 Miscellaneous Manufacturing</td>
<td>9.1</td>
<td>1.6</td>
<td>14.9</td>
</tr>
<tr>
<td>Aggregate Manufacturing</td>
<td>100.0</td>
<td>17.6</td>
<td>14.1</td>
</tr>
</tbody>
</table>

Source: Bernard et al. (2007).
Trade and Firms

- Overall share of US manufacturing firms that export relatively small at 18%

- Share of firms exporting in each industry category varies widely, e.g., 38% in computers and electronic products, to 8% in apparel manufacturing

- Exporters ship relatively small share of total shipments overseas, share across firms being 14%

- Again wide variation across industries, e.g., 21% in computers and electronic products, to 7% in beverage and tobacco products
Firms and Trade Theory

- Observation that, exporting more likely by skill-intensive as opposed to labor-intensive US firms, fits traditional model of trade
- Traditional model cannot explain why some firms export and others produce only for domestic market
- In US, exporting firms found to be larger, more skill and capital-intensive, and pay higher wages than non-exporters (Bernard et al., 2007)
- US MNCs enjoy 15% productivity advantage over exporting firms, who in turn have 39% advantage over domestic-only suppliers (Helpman et al., 2004)
Two key hypotheses proposed to explain higher productivity of exporters:

- exporting requires extra resources in terms of transportation, distribution and marketing costs, workers with foreign managerial skills, and modification of products for export – impose a barrier only more productive firms can bear

- firms can improve productivity by capturing knowledge and technical spillovers from participation in international markets, i.e., learning by doing effect
Firms and Trade Theory

- Role of fixed entry costs also important in both export and FDI-decisions
- Allowing for heterogeneous firms brings two new insights into trade models:
  - differences in productivity within industries matter
  - resource allocation happens within industries after trade liberalization, i.e., number of firms and volume of exports can change – extensive and intensive margins
- How is this captured in a simple model?
Trade and Firms

- Suppose only factor of production is labor \( L \), and to enter an industry, firms incur a fixed cost, \( f_E \).
- Upon entry, firms draw labor productivity coefficient \( a \) from distribution \( G(a) \) (firms can affect this through their R&D activities).
- With given \( a \), firms have four choices (see Figure 1):
  (i) Exit domestic market
  (ii) Serve domestic market only
  (iii) Export
  (iv) Set up foreign production (horizontal FDI)
Trade and Firms

Home Country $i$, $L_i$ and $w_i$

Entrant faces fixed cost $f_E$

Firm draws $a$ from $G(a)$

(i) Exit if $\pi_D < f_D$

(ii) Serve domestic market if $f_D < \pi_D < (f_D + f_X)$

(iii) Export to foreign market $j$ if $(f_D + f_X) < \pi_X < (f_D + f_I)$

(iv) Invest in foreign market $j$ if $(f_D + f_I) < \pi_I$, given $f_I > f_X$

KEY:
$L = \text{labor, } w = \text{wage rate}$
$a = \text{labor productivity}$
$f_E = \text{fixed costs of entry}$
$f_D = \text{fixed costs of home supply}$
$f_X = \text{fixed costs of exporting}$
$f_I = \text{fixed costs of FDI}$
$\pi = \text{profits}$

Figure 1: Firm Choices
Trade and Firms

- In Figure 2, along horizontal axis, firm productivity increases, while profits are measured on vertical axis.

- Domestic and FDI profit functions have same slope, as countries i and j are assumed to be the same in terms of demand, labor endowment and wages.

- Profits from exporting scaled by existence of trade costs t, so slope of export profit function is shallower.

- Sorting pattern of firms is actually very consistent with empirical evidence (Helpman et al., 2004).
Trade and Firms

Figure 2: Profits from Domestic Sales, Exports and FDI
Firms and Trade Liberalization

- Suppose productivity pattern same as in Figure 2
- If trade liberalization is treated as a reduction in \( t \), raises (lowers) profits of existing exporters (non-exporters), and lowers (raises) their productivity cutoff (Figure 3)
- Firms previously only supplying domestic market become exporters (extensive margin), and volume of exports also increases (intensive margin)
- Labor demand increases due to increase in both exports and number of firms exporting – wages bid up, reducing profits of non-exporting firms
Firms and Trade Liberalization

\[ \pi^i_D \]

\[ \pi^i_D' \]

\[ \pi^{ij} \]

\[ \pi^{ij}_X' \]

\[ a_D \]

\[ a_X' \]

\[ 0 \]

\[ a_D' \]

\[ a_l \]

\[ a_i' \]

\[ a_X \]

\[ -f_D \]

\[ -f_X \]

\[ -f_i \]
Firms and Trade Liberalization

- Induces low productivity firms to exit market, resulting in higher average industry productivity due to turnover of firms from domestic to export markets (Melitz, 2003; Bernard et al., 2007)

- Even though there are within industry gains, the gains are greater in any industry that has stronger comparative advantage – i.e., greater export opportunities intensify impact on wages, driving out more low-productivity firms

- Differential productivity growth across industries magnifies factor-abundance-based gains from trade