Graduating to globalisation

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March 25, 2009
Part I

The puzzle of outbound FDI by developing countries
Traditional investment theory

Five stages of development (World Investment Report, 2006)

1. Very little inward and outward FDI
2. Inward FDI starts to rise, little or no outward FDI
3. Growth of inward FDI starts to decline, while outward FDI picks up
4. Outward FDI equals or exceeds inward FDI
5. Net investment position of the country fluctuates around zero
Puzzle: Outbound FDI from developing countries

- Rapid rise of outbound FDI from developing countries is a challenge to this framework.
- Countries at similar levels of income have dissimilar levels of net outbound investment per capita.
- Brazil, India, China, Mexico, South Africa, Turkey have begun outward FDI at stages earlier than that predicted by theory.
- Traditional theory does not explain this puzzle.
Other explanations offered

- Government policy encourages outbound FDI but why would governments in poor countries push investment out
- Small home markets push firms out but most of these are large economies
- Strategic and knowledge based foreign assets are being acquired by firms in some sectors but investment is taking place across many different sectors
- So, the puzzle remains.
The behaviour of firms

- The traditional framework ignores the role that firms play in outbound FDI by a country.
- If firms become more productive firms they would invest abroad.
Helpman, Melitz, Yeaple (2004): a firm can serve foreign markets through export or outbound FDI. In equilibrium, only the more productive firms export, and the most productive firms do outbound FDI.
In a developing country context

Applying the HMY model to a developing country:

Tendency for firms to become more productive (eg. due to factors such as competition induced by trade liberalisation, learning by exporting, improvements in physical and human capital and other economy-wide factors), we will see more firms doing outbound FDI. This would increase outbound FDI by a country, even if it is a poor country.
Analytical framework

Propensity

Threshold for outbound FDI

Threshold for exporting

Time

Firm 1

Firm 2

Firm 3

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Outbound FDI from a developing country

- Suppose firms are becoming more productive.
- As firms become smarter, they start exporting.
- As they become even smarter, they start investing abroad.
- As firms get smarter, the country sees larger amount of outbound FDI.
Part II

India
Studying India as an example

- The puzzle of the sharp increase in outbound FDI from India cannot be explained by traditional theories.
- Have more firms in India become smarter and crossed the thresholds for exporting and then for investing abroad?
- What changed, or, what were the firm characteristics that they improved in?
Our dataset

- CMIE Cospi index: all firms with trading frequency of over 66% over the last six months.
- We take all non-financial firms which are in this index in March 2008.
- We track them from 2001 till 2007 – 7 years of data. Firm-years with sales or assets below Rs.10 million are dropped.
- This yields unbalanced panel data.
- In 2006-07, these firms have $0.5 trillion in total assets (50% of GDP) and have exports of $87 billion (37% of total exports of goods and services).
A firm and foreign customers

Four cases;

- **D** Domestic firm (in tradables and non-tradables)
- **DX** Domestic production + exports (in tradables)
- **DXI** Domestic production, exports and outbound FDI (in tradables)
- **DI** Domestic production + outbound FDI (in non-tradables)
## Counts of firms in the four categories

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>D</td>
<td>656</td>
<td>696</td>
<td>761</td>
<td>741</td>
<td>736</td>
<td>733</td>
<td>753</td>
<td>737</td>
<td>747</td>
<td>679</td>
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<td>DI</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>13</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>22</td>
<td>21</td>
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<tr>
<td>DX</td>
<td>959</td>
<td>1003</td>
<td>1013</td>
<td>1009</td>
<td>972</td>
<td>1028</td>
<td>1043</td>
<td>1059</td>
<td>1077</td>
<td>1072</td>
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<td>DXI</td>
<td>1</td>
<td>3</td>
<td>23</td>
<td>87</td>
<td>129</td>
<td>147</td>
<td>170</td>
<td>196</td>
<td>233</td>
<td>250</td>
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<td>Sum</td>
<td>1617</td>
<td>1703</td>
<td>1801</td>
<td>1843</td>
<td>1850</td>
<td>1924</td>
<td>1986</td>
<td>2016</td>
<td>2079</td>
<td>2022</td>
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</table>

**Table:** Count of firms classified into four categories
Firm characteristics

- Total assets
- Sales
- Gross value added
- Year of incorporation
- R&D to sales ratio
- Gross fixed assets
- Return on equity
Total assets

Median total assets (billion rupees)

D
DX
DXI

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Total Sales

- Median sales (billion rupees)
  - D
  - DX
  - DXI

Graph showing the trend of total sales from 2001 to 2007.
R & D to sales ratio

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Gross value added/total assets

<table>
<thead>
<tr>
<th>Year</th>
<th>GVA to TA Ratio</th>
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<tbody>
<tr>
<td>2001</td>
<td>0.15</td>
</tr>
<tr>
<td>2002</td>
<td>0.20</td>
</tr>
<tr>
<td>2003</td>
<td>0.25</td>
</tr>
<tr>
<td>2004</td>
<td>0.30</td>
</tr>
<tr>
<td>2005</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
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<tr>
<td>2007</td>
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Leverage

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### Probit models for exporting and outbound FDI

<table>
<thead>
<tr>
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<th>Probit for exports</th>
<th></th>
<th>Probit for FDI</th>
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<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>( t )</td>
<td>Coefficient</td>
<td>( t )</td>
</tr>
<tr>
<td>Industry fixed effects</td>
<td>Present</td>
<td></td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Present</td>
<td></td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Year of incorporation</td>
<td>0.0018</td>
<td>2.23</td>
<td>0.0043</td>
<td>3.56</td>
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<tr>
<td>Log value added</td>
<td>0.2687</td>
<td>10.48</td>
<td>0.1480</td>
<td>3.81</td>
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<td>Log total assets</td>
<td>−0.0789</td>
<td>−3.07</td>
<td>0.1441</td>
<td>3.73</td>
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<tr>
<td>Asset tangibility</td>
<td>−0.0058</td>
<td>−11.09</td>
<td>−0.0101</td>
<td>−12.07</td>
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<tr>
<td>R&amp;D to sales</td>
<td>0.0997</td>
<td>5.32</td>
<td>0.1129</td>
<td>8.27</td>
</tr>
<tr>
<td>Return on equity</td>
<td>−0.0013</td>
<td>−2.13</td>
<td>−0.0035</td>
<td>−3.47</td>
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<tr>
<td>LogL</td>
<td>−4415.38</td>
<td></td>
<td>−2080.10</td>
<td></td>
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<tr>
<td>AIC</td>
<td>8878.76</td>
<td></td>
<td>4208.21</td>
<td></td>
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</table>

**Table**: Probit models for exporting and outbound FDI
Ordered probit

\[ y^* = \beta' X + u \]

\[ u \sim N(0, \sigma^2) \]

\[ y = \begin{cases} 
D & \text{if} & y^* < \tau_1 \\
DX & \text{if} & \tau_1 \leq y^* < \tau_2 \\
DXI & \text{if} & \tau_2 \leq y^* 
\end{cases} \]
<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>t</th>
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</thead>
<tbody>
<tr>
<td>Industry fixed effects</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Year fixed effects</td>
<td>Present</td>
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<tr>
<td>Year of incorporation</td>
<td>0.0026</td>
<td>76.86</td>
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<tr>
<td>Log value added</td>
<td>0.2207</td>
<td>10.17</td>
</tr>
<tr>
<td>Log total assets</td>
<td>0.0037</td>
<td>0.17</td>
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<tr>
<td>Asset tangibility</td>
<td>-0.0069</td>
<td>-15.24</td>
</tr>
<tr>
<td>R&amp;D to sales</td>
<td>0.1160</td>
<td>10.46</td>
</tr>
<tr>
<td>Return on equity</td>
<td>-0.0017</td>
<td>-3.27</td>
</tr>
</tbody>
</table>

| $\tau$ cutoffs                |             |      |
| $\tau_1$                      | 4.8112      | 4181.02|
| $\tau_2$                      | 6.9420      | 272.39|
| LogL                          | -6539.89    |      |
| AIC                           | 13129.77    |      |

**Table:** Ordered probit model for exporting and outbound FDI
Distribution of estimated tau

Cutoffs of the ordered probit

Density of estimates

5.0 5.5 6.0 6.5 7.0
0 20 40 60 80
### Transition matrix

<table>
<thead>
<tr>
<th></th>
<th>D</th>
<th>DX</th>
<th>DXI</th>
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<tbody>
<tr>
<td>D</td>
<td>86.45</td>
<td>13.32</td>
<td>0.23</td>
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<td>DX</td>
<td>7.08</td>
<td>89.63</td>
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<td>DXI</td>
<td>0.32</td>
<td>8.47</td>
<td>91.22</td>
</tr>
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</table>

**Table:** Transition probabilities across firm categories
Shifting density plots

![Graph showing density plots for 2001 and 2007](image)

- **Propensity, \( y^* \)**
- **Density**

- **\( \tau_1 \)**
- **\( \tau_2 \)**

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Key results

- A single measure, the internationalisation propensity explains both exports and outbound FDI. There is a hierarchy where firms go from autarchy to exports to outbound FDI.
- This propensity has increased over time leading to an increase in outbound FDI by Indian firms.
- More firms have crossed the threshold of investing abroad in recent years. This has lead to a sharp increase in outbound FDI by India.
Key contribution of this paper: Explaining outbound FDI from a developing country, a puzzle not explained by the traditional literature.

Studying the HMY model in a dynamic developing country framework.

First study of outbound FDI explained by firms, using firm level data, from a developing country.
Thank you.