Fire Sale FDI

Viral Acharya  
London Business School

Hyun Song Shin  
Princeton University

Tanju Yorulmazer

Presentation at the NBER International Macro Workshop  
July 12 2007
Motivation

Foreign direct investment (FDI) flows surge during financial crises, even as there is an outflow of portfolio capital (example of Korea, 1990 - 2005)
FDI and FPI into Korea, 1990 - 2005

- FDI
- FPI Debt (Other)
- FPI Debt (1996-2000) - Best Fit
- FPI Debt (1996-2000) - Best Fit
Correlation between FDI and FPI

<table>
<thead>
<tr>
<th>COUNTRYNAME</th>
<th>THAILAND</th>
<th>PHILIPPINES</th>
<th>MALAYSIA</th>
<th>KOREA</th>
<th>INDONESIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corr(FDI,FPI)</td>
<td>0.51</td>
<td>0.66</td>
<td>0.00</td>
<td>0.74</td>
<td>0.72</td>
</tr>
<tr>
<td>Corr(FDI,FPI Debt)</td>
<td>0.05</td>
<td>0.73</td>
<td>-0.20</td>
<td>0.68</td>
<td>0.78</td>
</tr>
<tr>
<td>1996-2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corr(FDI,FPI)</td>
<td>-0.52</td>
<td>-0.61</td>
<td>-0.11</td>
<td>-0.43</td>
<td>0.59</td>
</tr>
<tr>
<td>Corr(FDI,FPI Debt)</td>
<td>-0.45</td>
<td>-0.75</td>
<td>-1.00</td>
<td>-0.85</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Correlation is **positive** for non-crisis years, but is **negative** for crisis years (1996 - 2000)

- Capital flight indicates lack of confidence. Why does FDI surge?
- Why do we observe such a juxtaposition during financial crises?
Outline of Theory

Domestic firms undertake consecutive projects over time

\[ t = 0 \quad t = 1 \quad t = 2 \]

Borrowing capacity at \( t = 1 \) limited by pledgeability factor \( \tau < 1 \)

Borrowing capacity \( = \tau \times \text{NPV of future project} \)

Cash holdings of domestic firms determined by outcome of first project
When current conditions deteriorate, prospects for future investment also darkens

Two effects:

• Borrowing constraint binds harder
  – Portfolio flows dry up (low FPI)

• Conjunction of (1) high failure rates and (2) low cash holdings of surviving domestic firms
  – “Cash in the market” pricing and distressed asset prices (Krugman (1998), Aguiar and Gopinath (2005))
  – But control unlocks value, even for lower valuation investors
  – Foreigners enter to take controlling stakes (high FDI)
Preview of Empirical Implications

• Negative correlation
  – During crises, FDI flows surge as FPI flows reverse

• Controlling stakes
  – FDI flows during crises are associated with controlling stakes

• “Flipping”
  – Assets purchased by foreigners in fire-sale FDI is re-sold quickly when the crisis abates.
Policy Implications

- Market prices during crisis times may be an unreliable guide to long-run fundamental values

- Role for public intervention in crisis resolution
  - Restructuring agency (RTC in U.S., BSA in Sweden, Kamco in Korea)
  - Temporary nationalization

- But public intervention must weigh up
  - Fiscal costs of intervention
  - Political economy factors
  - Severity of crisis
Model

- Three dates \(\{0, 1, 2\}\)
- Continuum unit mass of domestic firms
- Consecutive projects over time

\[ t = 0 \quad t = 1 \quad t = 2 \]
• Project needs input of 1

• Outcome for firm \( i \) at date \( t \) given high effort

\[
R_{it} = \begin{cases} 
R_t & \text{with prob } \alpha_t \\
0 & \text{with prob } 1 - \alpha_t 
\end{cases} \quad (R_t > 1)
\]

• But \( \{\alpha_0, \alpha_1\} \) are random variables (aggregate risk)

• Realization of \( \alpha_0 \) determines:
  – supply of assets from failed domestic firms
  – demand for assets from surviving domestic firms

• Date 1 NPV for domestic firm

\[
\bar{p} \equiv E (\alpha_1|\alpha_0) R_1 - 1
\]
• Foreign investors have lower valuation $\bar{p} < \bar{\bar{p}}$

• Moral hazard limits pledgeability of NPV (Holmstrom and Tirole (1997))

• Pledgeability factor is $\tau < 1$

• Total resources available to surviving domestic firm at date 1 to purchase failed firm assets is

$$\ell = R_0 + \tau E(\alpha_1 | \alpha_0) R_1 - 1$$

• Let $k$: be proportion of domestic firms that fail
Price of Failed Firm Assets

The diagram illustrates the price ($p$) of failed firm assets as a function of a parameter $k$. The price is shown to vary across different intervals of $k$, with key points marked as $k$, $\bar{k}$, and $1$. The price transitions through stages of full price, intermediate price, and a reservation price for outsiders.
Borrowing Capacity and FDI

Special case: \( k = 1 - \alpha_0, \quad E(\alpha_1|\alpha_0) = \alpha_0 \)
Three Regions for FDI and FPI

• Good states \((k \leq \hat{k})\).
  – All investment funded domestically

• Intermediate states \((\hat{k} < k \leq \bar{k})\).
  – Domestic investment funds supplemented with FPI

• Distress states \((k > \bar{k})\).
  – Domestic funds are insufficient
  – FDI rises with \(k\) but FPI falls with \(k\)
Extensions of Model

- Differential efficiency among foreigners
- Buying market equity versus buying assets
- Recovery and flipping of assets
- Resolution
Empirical Implications Revisited

• Negative correlation between FDI and FPI during crises (√)

• Controlling stakes (√)
  – Aguiar and Gopinath (2005)
  – SDC M&A data for Asian crisis countries show acquirer stake increases in 1998, to marginally over 50% (Acharya, Shin and Yorulmazer (2007))

• “Flipping”...
Flipping

Cumulative % of Deals Flipped

- Domestic acquirer
- Foreign acquirer

Time Since Original Acquisition (years)

0 2 4 6 8 10

0% 2% 4% 6% 8% 10% 12% 14% 16%
Private equity firms were prominent in acquiring Korean banks

- Low valuation investors? (private equity firms did not hold banking license in their home country)
- Subsequently sold stakes to banks (Korean and foreign)

<table>
<thead>
<tr>
<th>Acquirer</th>
<th>Target</th>
<th>Purchase Price</th>
<th>Sale Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lone Star</td>
<td>KEB</td>
<td>$1.4bn</td>
<td>$4.9 bn(^1)</td>
</tr>
<tr>
<td>Newbridge</td>
<td>Korea First</td>
<td>$0.48bn</td>
<td>$3.3bn</td>
</tr>
<tr>
<td>Carlyle &amp; JP Morgan</td>
<td>KorAm</td>
<td>$0.43bn</td>
<td>$2.73bn</td>
</tr>
</tbody>
</table>

\(^1\)Sale did not proceed due to legal proceedings by public prosecutors.
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