Mitigating Systemic Spillovers from Currency Hedging

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Figure 1. Short-term bank FX liabilities (Source: Bank of Korea)
Figure 2. Non-core liabilities of Korean banks (Source: Shin and Shin (2010), data from Bank of Korea)
Figure 3. Non-core liabilities of Korean banks as proportion of M2 (Source: Shin and Shin (2010), data from Bank of Korea)
Hahm, Shin and Shin (2011)

IMF International Financial Statistics (Jan 2000 ∼ Dec 2010), monthly data

Non-core 1 = Liability of banks to the foreign sector + Liability of banks to the non-banking financial sector

Non-core 2 = Liability of banks to the foreign sector + (M3 − M2)
## Random Effects Panel Probit Regression for Currency Crisis: Monthly Data for Non-Core Sum

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<td>Credit/GDP</td>
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<td>(3.06)</td>
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<td>(M3-M2)/M2</td>
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Figure 4. Non-core liabilities of Korean banks (Source: Shin and Shin (2010), data from Bank of Korea)
Figure 5. Capital flows for Korea in equity and banking sector (Source: Shin and Shin (2010), data from Bank of Korea)
Korean Shipbuilder

Banking sector inside Korea

Long-dated $ receivables

Forward long $

Source: Chung, Park and Shin (2012)
Figure 7. Estimated increase in foreign debt due to hedging activities by category (Source: Chung, Park and Shin (2012))
Figure 8. Equity sector capital flows of domestic investors (Source: Chung, Park and Shin (2012))
Figure 9. Estimated increase in foreign debt due to hedging activities by category (Source: Chung, Park and Shin (2012))
### Figure 10. Attributing increase in FX liabilities to hedging activity categories (Source: Chung, Park and Shin (2012))

<table>
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<tr>
<th>(Billion dollars)</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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<td>Shipbuilders' new orders</td>
<td>23.90</td>
<td>31.80</td>
<td>31.27</td>
<td>61.70</td>
<td>97.50</td>
<td>71.79</td>
<td>18.33</td>
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<td>Estimated increase in foreign debt due to shipbuilders' hedging activities</td>
<td>1.15</td>
<td>4.64</td>
<td>5.70</td>
<td>14.00</td>
<td>19.97</td>
<td>5.24</td>
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<td>Sale of dollar forwards by shipbuilders</td>
<td>4.47</td>
<td>12.50</td>
<td>16.82</td>
<td>35.25</td>
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<td>41.49</td>
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<td>Settlement of maturing forwards by shipbuilders</td>
<td>-2.89</td>
<td>-6.14</td>
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<td>-34.31</td>
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<td>-32.34</td>
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<td>Net sale of dollar forwards by shipbuilders</td>
<td>1.58</td>
<td>6.36</td>
<td>7.81</td>
<td>19.18</td>
<td>27.36</td>
<td>7.18</td>
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<td>Net increase in foreign stock holding of domestic investors</td>
<td>1.63</td>
<td>5.59</td>
<td>4.90</td>
<td>22.91</td>
<td>68.04</td>
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<td>24.44</td>
<td>9.60</td>
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<td>Estimated increase in foreign debt due to hedging activity of asset managers</td>
<td>1.00</td>
<td>3.43</td>
<td>3.00</td>
<td>14.05</td>
<td>41.72</td>
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<td>5.89</td>
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<td>Estimated increase in foreign debt due to hedging activity of shipbuilders and asset managers</td>
<td>2.15</td>
<td>8.07</td>
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<td>28.05</td>
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<td>Increase in total foreign debt (C)</td>
<td>8.89</td>
<td>8.98</td>
<td>10.79</td>
<td>63.79</td>
<td>108.23</td>
<td>-16.06</td>
<td>28.31</td>
<td>13.76</td>
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<td>Increase in banking sector foreign debt (D)</td>
<td>9.26</td>
<td>6.76</td>
<td>8.94</td>
<td>53.11</td>
<td>56.34</td>
<td>-23.46</td>
<td>10.84</td>
<td>-7.18</td>
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Figure 11. Increase in foreign debt attributed to hedging activities (Source: Chung, Park and Shin (2012))
Amplification Channel

Cross-border lending → Expected appreciation → Default probability

Figure 12. Consistency between (i) expected appreciation (ii) default probability of borrower and (iii) lending through cross-border banking sector inflows.
Figure 13. Capital flows for Korea in equity and banking sector (Source: Shin and Shin (2010), data from Bank of Korea)
Figure 14. This figure depicts the lending relationships examined in the model. A foreign bank branch lends to local borrowers in dollars and finances its lending from the wholesale dollar funding market.
Figure 15. Timeline for model: dollar loans are granted at date 0 at the exchange $\theta_0$ and are repaid at date $T$ at exchange rate $\theta_T$. 
Bruno and Shin (2012)

Figure 16. The borrower defaults when $\theta_T V_T$ falls short of the notional debt $F$. The effect of a currency appreciation is to shift the outcome density upward, lowering the default probability.
Figure 17. The two charts plot the densities over realized assets when $C \left(1 + r\right) = 1$. The left hand charts plots the density over asset realizations of the bank when $\rho = 0.1$ and $\varepsilon$ is varied from 0.1 to 0.3. The right hand chart plots the asset realization density when $\varepsilon = 0.2$ and $\rho$ varies from 0.01 to 0.3.
Supply of Credit

Credit supply $C$ and demand for funding $L$ is obtained from (??) and balance sheet identity $C = E + L$

$$C = \frac{E}{1 - \frac{1+r}{1+f} \cdot \phi}, \quad L = \frac{E}{\frac{1+f}{1+r} \cdot \frac{1}{\phi} - 1}$$

Aggregation holds due to proportionality

$$\text{Leverage} = \frac{1}{1 - \frac{1+r}{1+f} \cdot \phi}$$
**Recursive VAR** | **Ordering** | 1 | 2 | 3 | 4
---|---|---|---|---|---
Impact of (↓) | On Fed Funds | On BD Leverage | On VIX | On US dollar REER
Fed Funds
BD Leverage
VIX
US dollar REER

**Figure 18.** Impulse response functions in recursive VAR.
**Impulse Responses from Four Variable VAR**

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<th>Impact of Fed Funds</th>
<th>Impact of BD Leverage</th>
<th>Impact of Fed Funds</th>
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<td>on BD Leverage</td>
<td>on US dollar REER</td>
<td>on US dollar REER</td>
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Exchange Stabilization and Guarantee Corporation

- Public corporation
- Fully equity financed
- Valued in US dollars
- Allowable activities restricted by charter
Figure 19. *Exchange Stabilization and Guarantee Corporation* (ESGC) accepting forward dollar contract (Source: Chung, Park and Shin (2012))
ESGC Operations

- Forwards
- Swaps
- SME forwards and swaps within credit guarantee wrapper
- Central counterparty in forward contracts for exporters and importers
Figure 20. *Exchange Stabilization and Guarantee Corporation* (ESGC) accepting forward dollar contract with KODIT (Korea Credit Guarantee Fund) guarantee (Source: Chung, Park and Shin (2012))
Figure 21. Exchange Stabilization and Guarantee Corporation (ESGC) providing export trade credit with KODIT (Korea Credit Guarantee Fund) guarantee (Source: Chung, Park and Shin (2012))
Figure 22. Exchange Stabilization and Guarantee Corporation (ESGC) as central counterparty between export firm and import firm (Source: Chung, Park and Shin (2012))
Political Economy Considerations

- **International political economy context**
  - If ESGC is funded from FX reserves, headline FX reserves decline
  - ESGC is not used for intervention in FX market (contrast to *Exchange Equalization Fund (EEF)*)

- **Domestic political economy context**
  - ESGC is valued in US dollars, not Korean Won
  - ESGC is not vulnerable to mark-to-market losses due to KRW appreciation
  - Lessons from Switzerland 2010 - 2012, Korea 2003 - 2005
  - Good fit with policy agenda to strengthen SME sector
Political Economy Considerations

- ESGC is automatic stabilizer

- Shielded from political pressure around key decision dates
  - Contrast with monetary policy committee meetings of central banks

- Redresses burden of proof in favor of more timely intervention
Korea’s Macroprudential Levy

- Levy on FX-denominated bank liabilities
- Range of 0 \sim 100 \text{ basis points}
  - 20 \text{ bp} for short-term FX liabilities
  - Lower rate for long-term FX liabilities
- Proceeds go to Macroprudential Fund
- Valued in US Dollars
Properties of Levy on Non-Core Liabilities

• Automatic stabilizer
  – Base of levy varies over cycle
  – Levy bites hardest during booms

• Minimize impact on core intermediation

• Leans against carry trade inflows and build-up of vulnerability

• Focus on financial stability, not classical ”capital control”
  – Will affect exchange rates, but not primary concern
Macroprudential Measures: Short-Term and Medium-Term Perspectives

• LTV and DTI policies to lean against excessive credit growth

• “Triple Set” of policies to mitigate vulnerabilities due capital inflows
  – Equalization of tax treatment of domestic and foreign investors
  – Leverage cap on bank FX derivatives positions
  – Macroprudential levy on bank FX liabilities

• Address underlying causes of vulnerability