

CAPITAL FLOWS AND CAPITAL ACCOUNT MANAGEMENT IN SELECTED ASIAN ECONOMIES

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Issues

- Why do some emerging economies feel the need to manage capital flows?
- How do they manage capital flows?
- Do capital flow management measures (CFMs) deliver on the intended objectives?

Motivation

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 - ▶ Capital inflows provide additional investment financing and avenues for risk diversification.
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- EMEs forced to undertake capital account management measures to stem flow of capital.

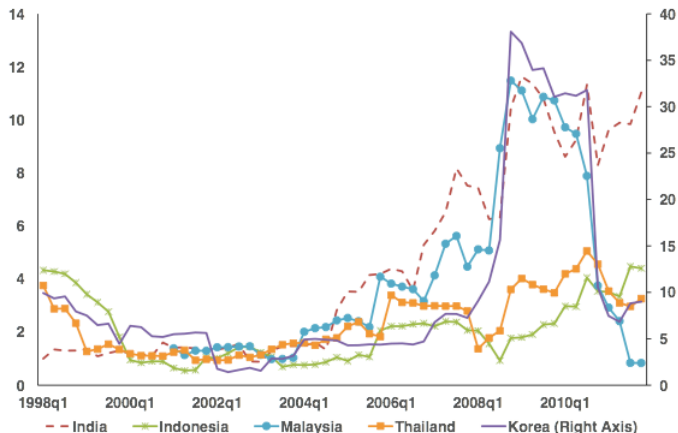
Objective

- We focus on evolution of capital flows in few select emerging Asian economies (EAEs).
 - ▶ Analyze surge-stop episodes and changes in composition of flows across these episodes.
- Describe capital account management policies adopted by host countries.
 - ▶ Allowing greater exchange rate flexibility- management of Impossible Trilemma
 - ▶ Forex intervention and reserves accumulation
 - ▶ Imposition or relaxation of capital controls on inflows and outflows

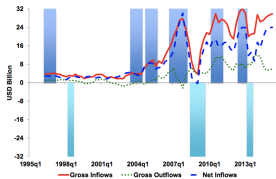
Volatile Flows in EAEs

- India, Indonesia, South Korea, Malaysia, Thailand; 1995Q1-2011Q4 (extended till 2015Q4).

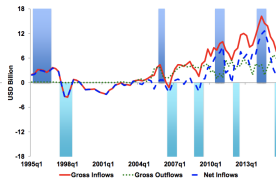
Figure 1: Volatility in Capital Inflows in Asia



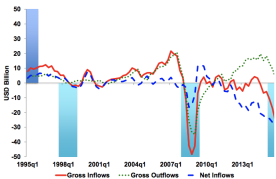
Surge-Stop Episodes



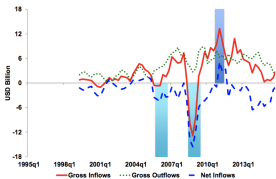
(a) India



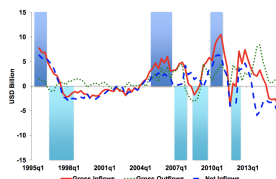
(b) Indonesia



(c) Korea



(d) Malaysia



(e) Thailand

Composition of Flows: Surges and Stops

Surges

- India: Mostly bank & non-bank flows (mid 1990s, 2004-05 & 2006-08 surges) and portfolio equity flows (2003-04 & 2010 surges) with FDI peaking during longest pre-GFC surge (2006Q4-2008Q2).
- In both surge episodes post-GFC, bank and non-bank flows and FDI flows accounted for two-third of the gross inflows.

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Stops

- India impacted by GFC: From \$100.6 billion in 2007, private capital inflows dropped to \$33.2 billion in 2008.
- More than 60% of the cumulative reversal for the 5 EAEs was on account of bank lending followed by portfolio equity.
- FDI inflows remained fairly constant.

Policy response to manage flows

- Policymakers' desire to prevent capital surges stems from risks associated with such episodes.
 - ▶ Excessive inflows could result in exchange rate appreciation, which can hurt exports of EMEs (Subramanian and Rajan, 2005; Prasad et al., 2007)
 - ▶ In underdeveloped financial systems, foreign capital channeled towards easily collateralized, non-tradable investments like real estate causes asset price booms, with subsequent busts disrupting the economy (Prasad and Rajan, 2008)
 - ▶ 15% of capital inflow episodes over past two decades have resulted in a crisis (Schadler, 2010)

Policy response to manage flows

- Policymakers have recourse to three macroeconomic measures to deal with capital flows.
 - ① Enhancing exchange rate flexibility
 - ② Undertaking forex intervention
 - ③ Using capital controls
- Manage the trade-offs posed by the Impossible Trilemma.

I. Enhancing Exchange rate Flexibility: Impossible Trilemma

- Impossible Trilemma: Can attain only two of the three policy objectives- exchange rate stability (ERS), monetary independence (MI), and capital account openness (KO).
- Need to allow greater exchange rate flexibility in face of capital inflows, driven by desire to achieve monetary autonomy.
 - ▶ We use empirical methods (Aizenman, Chinn, Ito, 2010) to describe EAEs' experience with Trilemma.
 - ▶ 2000Q1-2015 Q4; period split into 4 equal segments.

Trilemma Indices: Monetary Independence

- Reciprocal of correlation of interest rates in home country and base country (United States).
- Quarterly correlations calculated using weekly interest rate data.

$$MI = 1 - \frac{\text{corr}(i_i, i_j) - (-1)}{1 - (-1)}$$

- By definition the index lies between 0 and 1.
- The highest value indicates the greatest degree of monetary independence.

Trilemma Indices: Exchange Rate Stability

$$d\log \frac{INR}{CHF_t} = \beta_1 + \beta_2 d\log \frac{USD}{CHF_t} + \beta_3 d\log \frac{JPY}{CHF_t} + \beta_4 d\log \frac{Euro}{CHF_t} + \beta_5 d\log \frac{GBP}{CHF_t} + \epsilon_t$$

- Frankel-Wei (1994) model.
- The magnitude of each estimated coefficient shows the extent to which the INR moves in response to changes in the corresponding currency. The higher the coefficient, the more the INR is pegged to that currency.
- The R-squared of this regression is a measure of exchange rate flexibility. R-squared values close to 1 suggest reduced exchange rate flexibility.

Evolution of Trilemma in India

- **2000Q1-2003Q4:** Pegged exchange rate, financial market integration lowest.
- **2004Q1-2007Q4:** Capital account openness went up, low MI, high ERS.
- **2008Q1-2011Q4:** Slump in capital flows, greater emphasis on MI, ERS came down.
- **2012Q1-2015Q4:** Capital flows recovered, greater ERS, low MI.

II. Intervention in forex market

- 5 EAEs resorted to FX intervention leading to reserve accumulation.
- India built 78% of its end-2011 reserve holdings during the surge episodes.
- Stop episodes not associated with reserve depletion.
- Where the EAEs intervening in an asymmetric manner?

Intervention in forex market

- We empirically investigate this using a central bank loss function following Pontines and Rajan (2011), Sen Gupta and Sengupta (2014) for 2000-2016.

$$L_t = \frac{1}{2} (R_t - R^*)^2 + \frac{\phi}{2} \left((\tilde{\varepsilon}_t - \varepsilon^*)^2 + \frac{\theta}{3} (\tilde{\varepsilon}_t - \varepsilon^*)^3 \right)$$

- Central bank aims to minimize deviation of reserves and exchange rate from their respective target values.
- ϕ is relative weight on stabilizing exchange rate vis-a-vis reserves.
- The right most term introduces asymmetry in the loss function.
- With $\theta > 0$, an appreciation ($\tilde{\varepsilon} > 0$) increases the central banks loss while depreciation ($\tilde{\varepsilon} < 0$) reduces the extent of loss.
- A positive θ implies asymmetric intervention.

Asymmetric intervention in FX market

Table 2: Extent of Asymmetric Intervention in EAEs: 2000-2011

	India	Indonesia	Korea	Malaysia	Thailand
β_0	2.112*** [18.964]	1.137*** [11.939]	1.021*** [16.156]	2.176*** [22.499]	0.846*** [9.476]
β_1	-0.419*** [-9.997]	-0.357*** [-11.403]	-0.425*** [-14.106]	-1.169*** [-21.311]	-0.772*** [-15.443]
β_2	-0.205*** [-9.934]	-0.014*** [-4.307]	-0.027*** [-6.359]	-0.864*** [-22.753]	-0.124** [2.348]
θ	0.978***	0.078***	0.127***	1.478***	0.321**
Number of Observations	128	128	128	128	128

Notes: Robust t-statistics in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% respectively Source: Authors' Estimates.

Table 3: Extent of Asymmetric Intervention in EAEs: 2007-2016

	India	Indonesia	Korea	Malaysia	Thailand
β_0	1.016*** [11.10]	1.063*** [12.47]	0.539*** [16.69]	0.223 [1.31]	-0.024 [-0.19]
β_1	0.495*** [10.35]	0.505*** [26.77]	0.486*** [60.46]	0.987*** [7.42]	0.731*** [5.84]
β_2	-0.144*** [-7.07]	-0.019*** [-12.48]	-0.020*** [-23.25]	-0.046 [-1.04]	0.341 [4.60]
θ	0.582***	0.075***	0.082***	0.093	0.933
Number of observations	111	111	111	111	111

Note: Robust z-statistics in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1% respectively. Source: Authors' Estimates.

III. Capital Controls

- All 5 EAEs experimented with capital controls (or CFMS) to mitigate adverse effects of inflows and outflows on domestic financial markets and exchange rate.
- To assess impact of selected controls on exchange rate and stock market, we undertake means comparison test before & after introduction of controls.
 - ▶ India - Imposition of restrictions on 'participatory notes' in October 2007 to curb portfolio investment inflows.

Impact of select controls

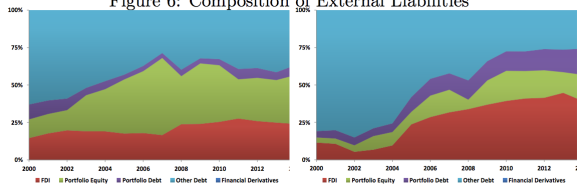
- Efficacy of capital controls in restricting exchange rate appreciation and stock price increase.
- Short & longer term effect, focusing on periods covering 1-month & 6-month before and after imposition of controls.
 - ▶ In the short-term there is some evidence of capital controls restraining exchange rate appreciation in India.
 - ▶ Trend of exchange rate appreciation prior to the imposition of the control was reversed after the measures were introduced.
 - ▶ Measures reversed the trend of stock price increase over a window of one-month.
 - ▶ No longer term effect.
- Similar effect found in Korea but not in the other EAEs.

Effectiveness of capital controls

- Episodic controls in response to surges in an otherwise open capital account regime, found to have limited impact on exchange rates (or asset prices), in short term and long term.
- Moderate success in lowering volume of gross inflows.
 - ▶ Klein, 2012; Jinjarak et al, 2013; Sen Gupta & Sengupta, 2015; Forbes et al, 2015; Shah et al, 2015.
 - ▶ Episodic controls ('Gates') less effective than longer-term controls ('Walls') - Klein (2012).
- Only effective in altering composition of inflows.

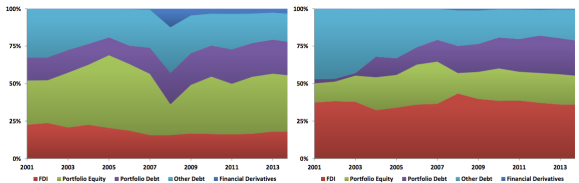
Changes in composition of capital flows

Figure 6: Composition of External Liabilities



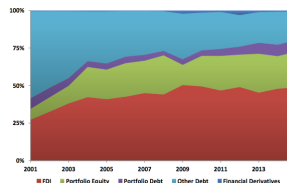
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21st century Trilemma in EMs

- Study attempts to enrich the current debate ongoing in global policy circles on the measures adopted by countries to deal with volatile capital flows.
- Relevant especially at a time when EMEs are about to face repercussions of a potential monetary policy normalization by the US.
- Trilemma management: Trade off between allowing exchange rate to act as shock absorber and sacrificing monetary independence.
 - ▶ Several EMs, including India, have adopted IT as a monetary policy strategy - a clear nominal anchor.
 - ▶ So can choose between open capital account and flexible exchange rates OR capital controls and stable exchange rates.
- Immediate response to surges & stops: Capital controls ('Gates'). Ex-post, reactive imposition of controls not effective.

21st century Trilemma in EMs

- Cost-benefit analysis: which strategy is lesser of the two evils and worth pursuing in interest of long term growth objective?
- Are we still dwelling in a world characterized by the ‘fear of floating’?
- Deepen domestic financial markets and strengthen financial institutions to better absorb volatile capital inflows.

Thank you

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