



# “TRILEMMAS AND TRADEOFFS” BY MAURICE OBSTFELD

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\*The views expressed in this presentation are those of the presenter and do not necessarily represent those of the IMF or IMF policy. This presentation draws on joint work with Atish Ghosh, Marcos Chamon, Mahvash Qureshi and Charalambos Tsangarides.

# A Valuable Contribution On a Heated Topic

- This important paper enters a contentious debate
  - ▣ Woodford (2010): Globalization has no effect on monetary independence in EMEs when the ER is floating
  - ▣ Rey (2013): Global financial cycle means that irrespective of ER regime, EMEs have no monetary autonomy unless they impose capital controls
- Obstfeld's innovative contribution shifts debate from monetary autonomy to the key policy issue: how to hit multiple objectives with limited instruments
  - ▣ A middle ground on monetary autonomy: *“Independent monetary policy is feasible for financially open EMEs, but limited in what it can achieve.”*
  - ▣ Globalization worsens trade-offs and reduces effectiveness of instruments
- Perhaps too little attention paid to the virtues of managed floats

# The Paper: Main Results

# ER Flexibility is Essential for Macro Management

- ER flexibility increases the range of ST policy options for EMEs:
  - *“It strikes me as not really fruitful to ask if the exchange rate regime materially influences the scope for monetary policy independence. Of course it does.”*
- Monetary policy independence is useful in responding to capital flows
  - During a surge in capital inflows, floating allows ER to be a shock absorber: tighter monetary policy and a stronger currency, rather than a forced loosening of monetary policy under a peg
  - During a sudden capital outflow, floating protects the economy as the depreciating currency absorbs the shock, which cannot happen under a peg
- Empirical analysis in Obstfeld’s paper is broadly supportive: ST policy rate seems less correlated with the foreign rate in floats than in pegs

# But ER Flexibility is Not Enough

- Policymakers have many macro and financial-stability objectives
  - ▣ Inflation and the output gap; competitiveness and the exchange rate; financial stability in the face of boom-bust cycles in credit and asset prices
- And the ST policy rate alone cannot achieve all these objectives
  - ▣ There is no “divine coincidence” that if you hit one target, you will hit them all
  - ▣ So policymakers need more instruments:
    - “Astute observers have long known that in principle monetary policy is vital, but cannot furnish the sole response to capital inflow surges.”*
- But Problem #1: Financial globalization worsens policy tradeoffs
  - ▣ Raising the policy rate to limit overheating during a surge in inflows can encourage even more inflows, undercutting ER and financial-stability objectives
- And Problem #2: Globalization reduces effectiveness of tools
  - ▣ Circumvention of prudential policies is greater in a financially globalized world
  - ▣ Macro-prudential tools ineffective when lenders are under foreign jurisdictions; domestic borrowers can escape limits on domestic FX debt by issuing offshore

# “Managing” the ER is Not the Way to Go

- Flexible ER regimes yield superior outcomes relative to ER pegs:
  - *“Those EMEs able to exploit a flexible exchange rate are far better positioned than those that devote monetary policy to fixing the rate.”*
- Managing the ER is risky:
  - *“Persistent sterilization...[and]... heavy intervention in the foreign exchange market... have tended to provide especially strong incentives for short-term capital inflows.”*
  - Danger is that managing the ER encourages one-way bets by speculators, and we are back to the undesirable ER peg
- FX intervention may create more problems than it solves:
  - *“Countries that resisted exchange-rate change through intervention saw greater pressure on domestic asset prices, on domestic credit growth, and on general product price levels.”*
- Main purpose of reserves is financial stability not macro management
  - *“Large stocks of foreign exchange reserves ... allow the domestic monetary authority to play a lender-of-last-resort role for financial institutions with short-term foreign-currency liabilities.”*

# Empirical Evidence Supports the Narrative

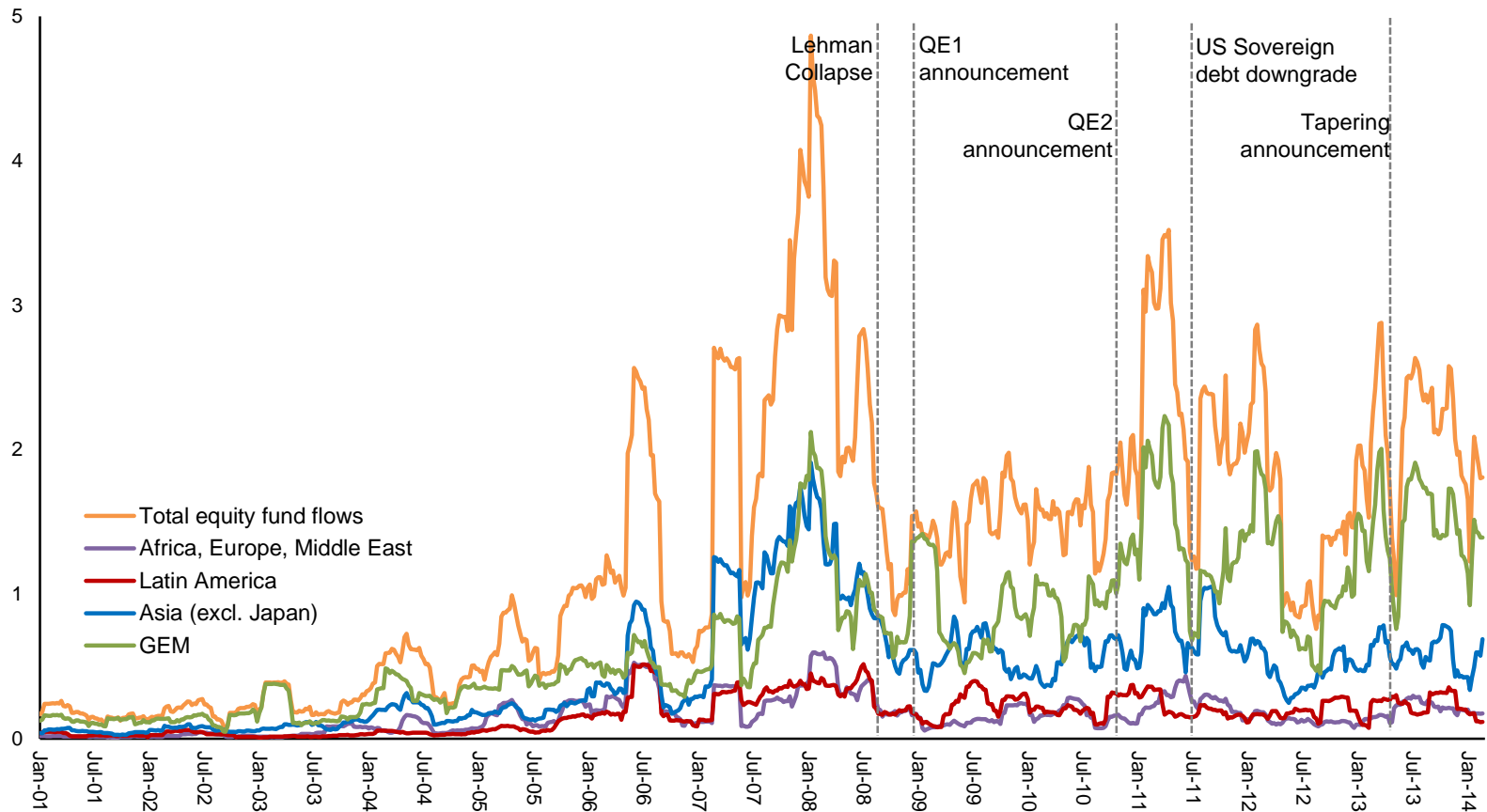
- Narrative on monetary policy independence is corroborated using observed correlations between domestic and foreign interest rates
- Full-sample results (Table 2) provide clearest support for the narrative
  - ▣ ST policy rates are not correlated for floats, but they are for pegs
  - ▣ Though correlation for pegs does fall when time effects are included
  - ▣ LT interest rates are correlated irrespective of the ER regime – not surprising in a world with financial integration
- Comparison of the AE and EMDC sub-samples (Tables 3-4) indicates that there is more going on behind the scenes
  - ▣ AEs: ST policy rate correlations are significant even for floats, reflecting importance of correlated shocks when countries are financially integrated
  - ▣ EMDCs: ST correlations are large but not significant for pegs, indicating a lot of noise in the relationship between ER regime and policy independence

# Capital Flow Volatility and the Policy Toolkit



# Capital Flow Volatility is a Risk for EMEs

**Volatility of Equity Fund Flows to EMEs,**  
2001M1-2014M3 (billions of dollars; weekly flows)

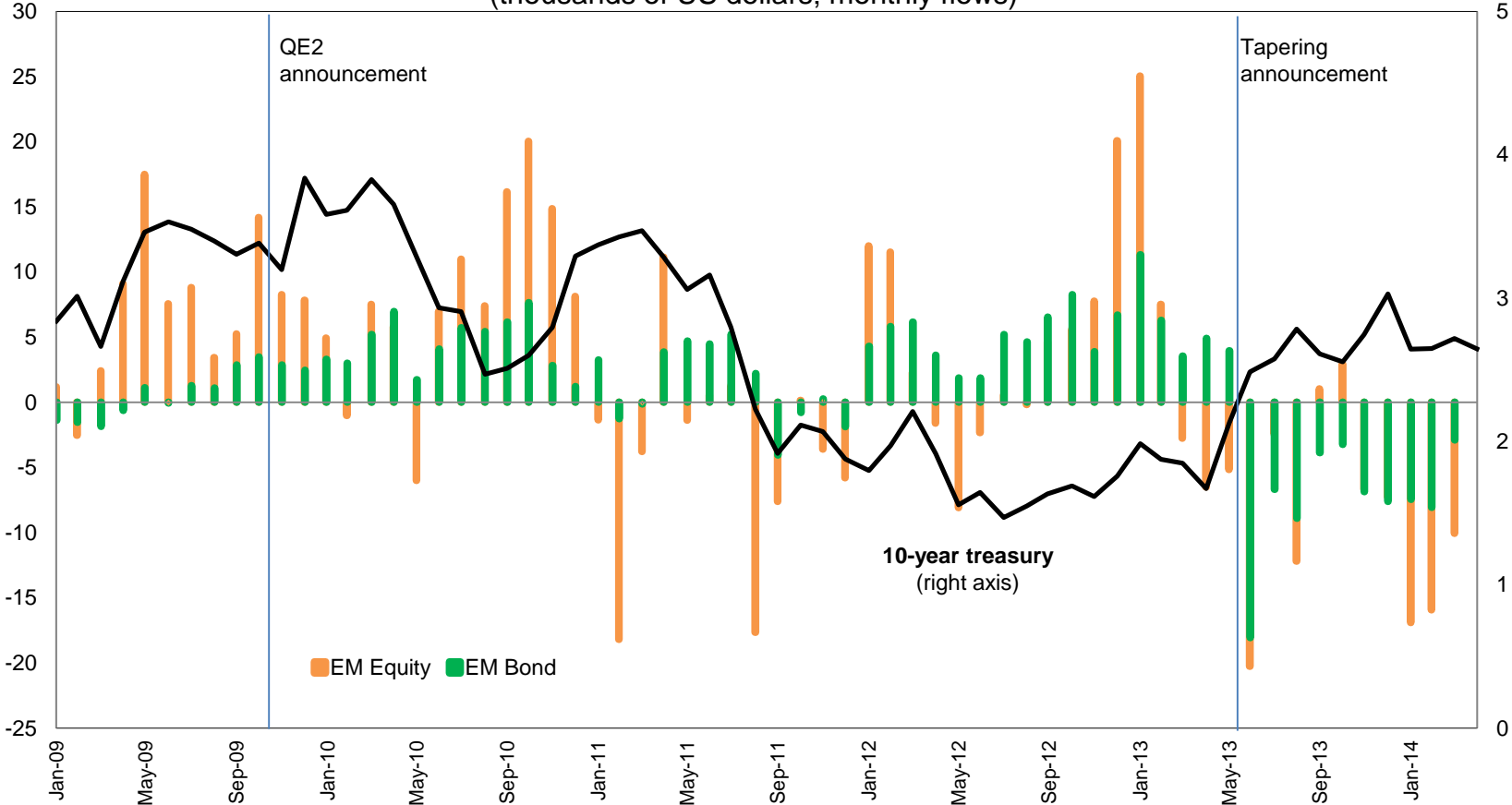


Source: EPFR.

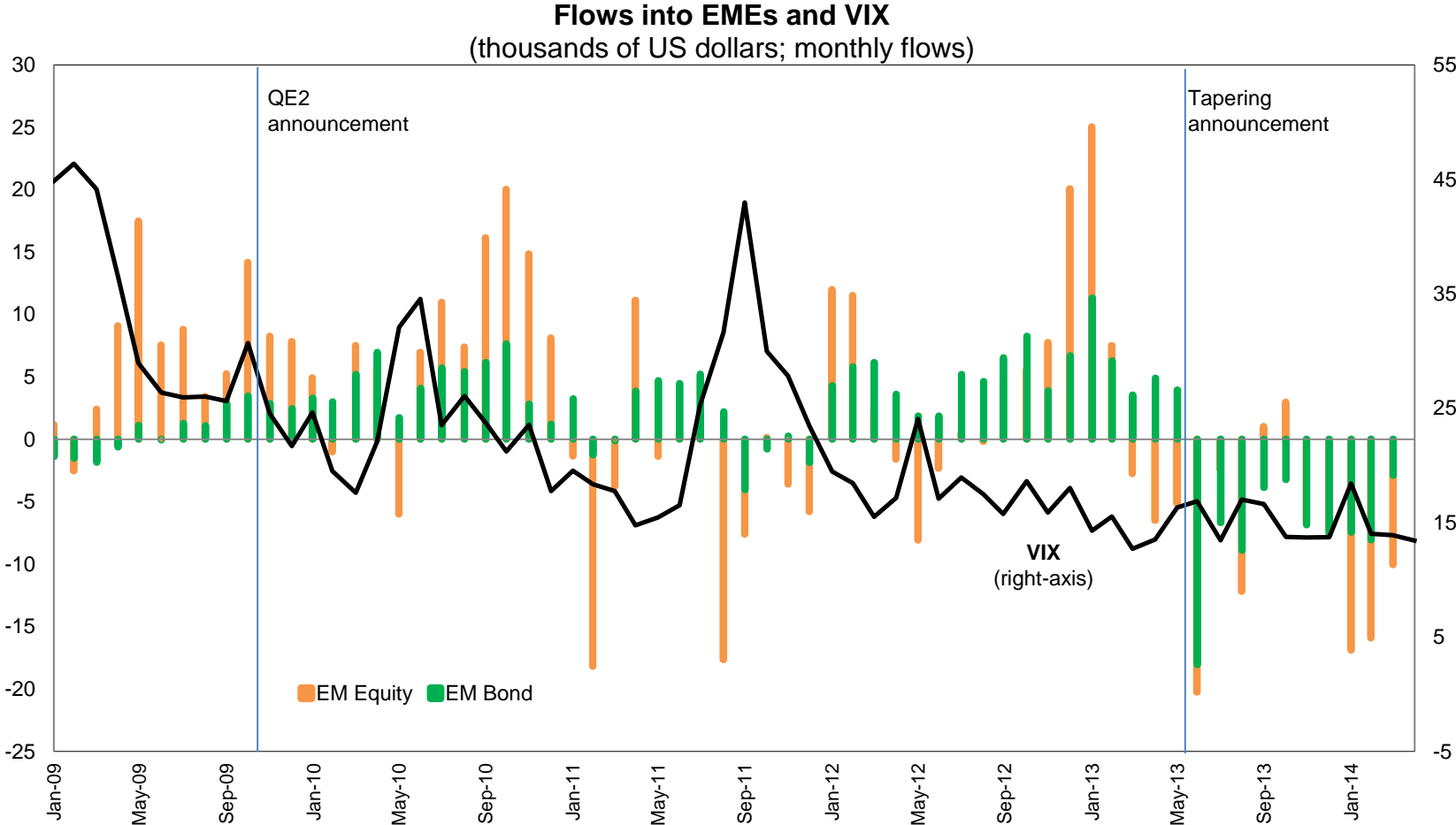
\*Rolling standard deviation of weekly equity flows over the previous quarter.

# Global Monetary/Financial Cycle Plays a Key Role

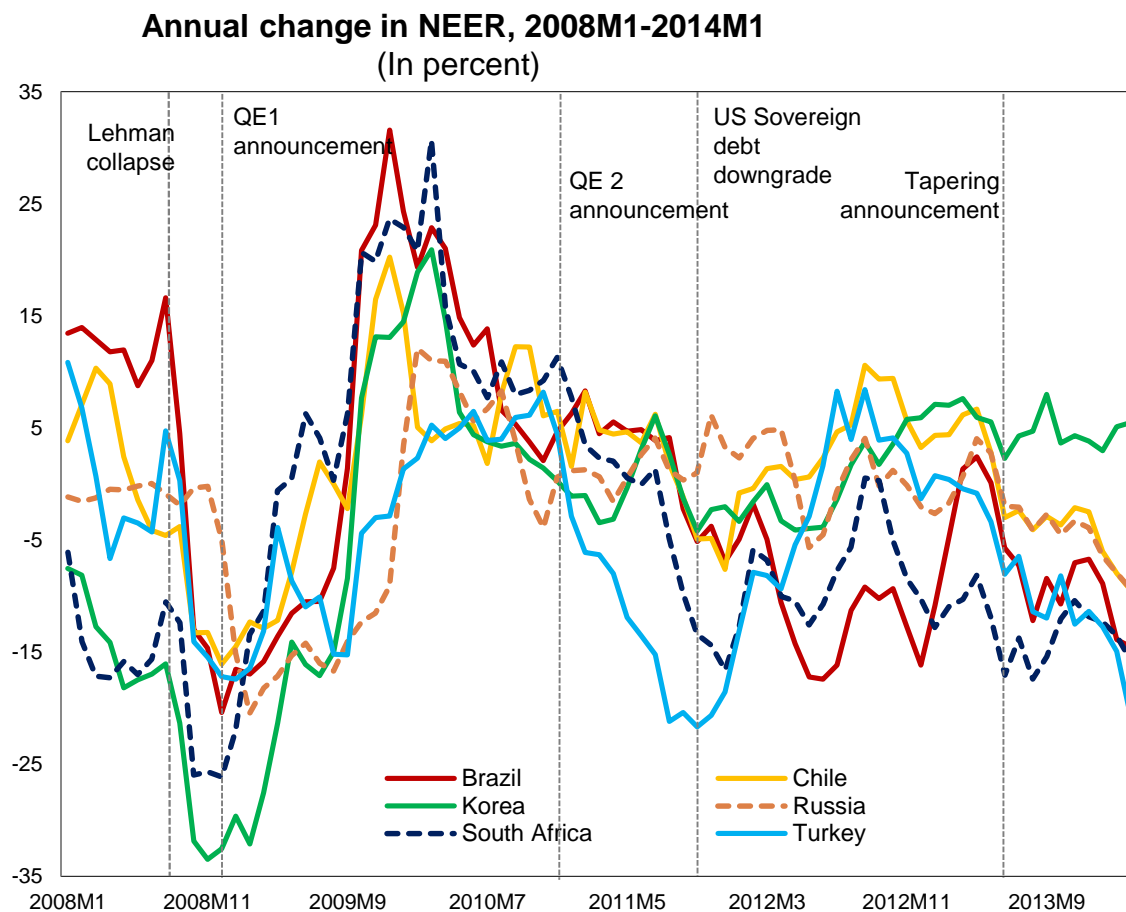
**Flows into EMEs and 10-year Treasury Yields**  
(thousands of US dollars; monthly flows)



# Global Monetary/Financial Cycle Plays a Key Role



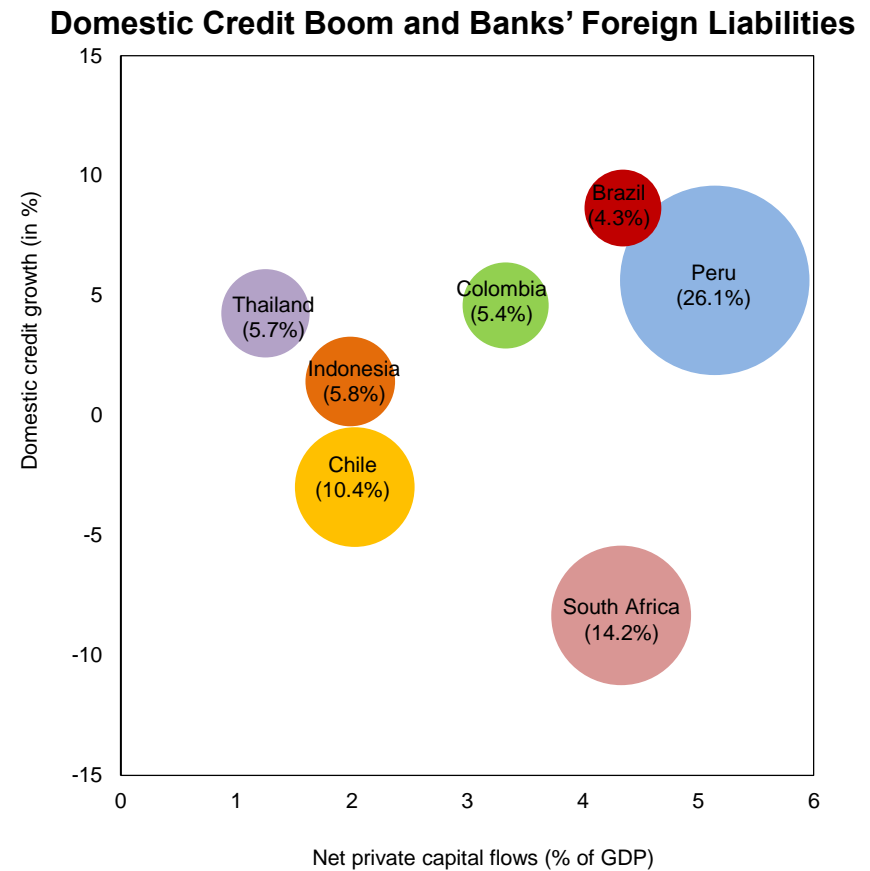
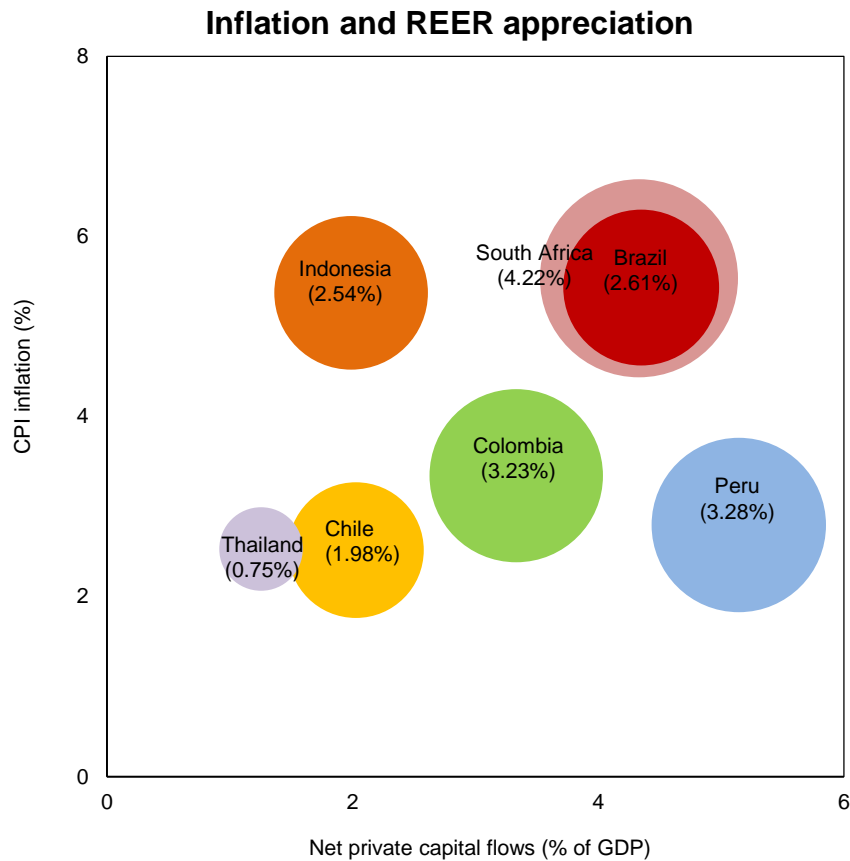
# Such Volatility Induces Large ER Fluctuations...



Source: INS database.

Note: An increase in value reflects appreciation of the currency.

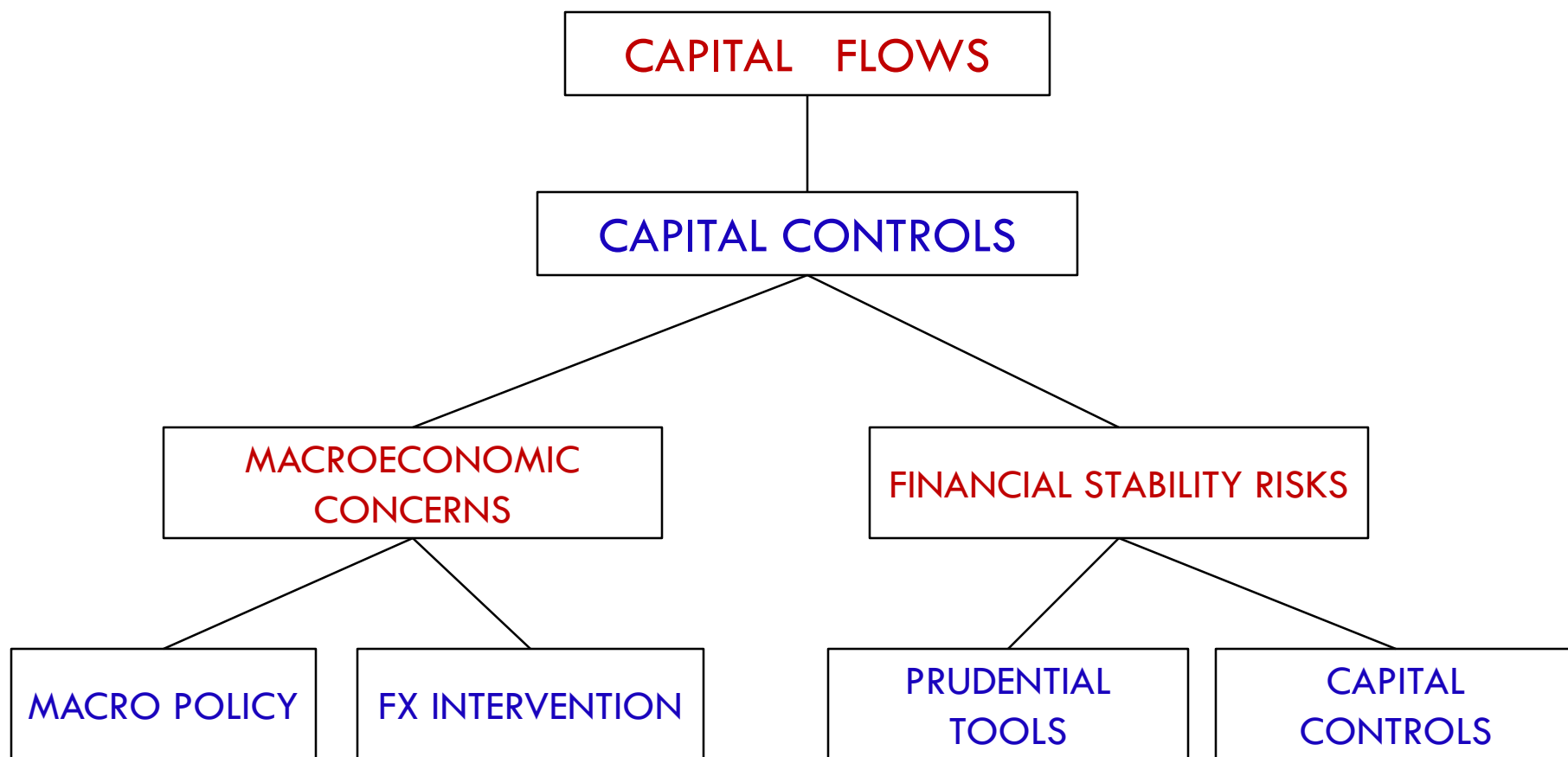
# ... and Macro and Financial-Stability Risks



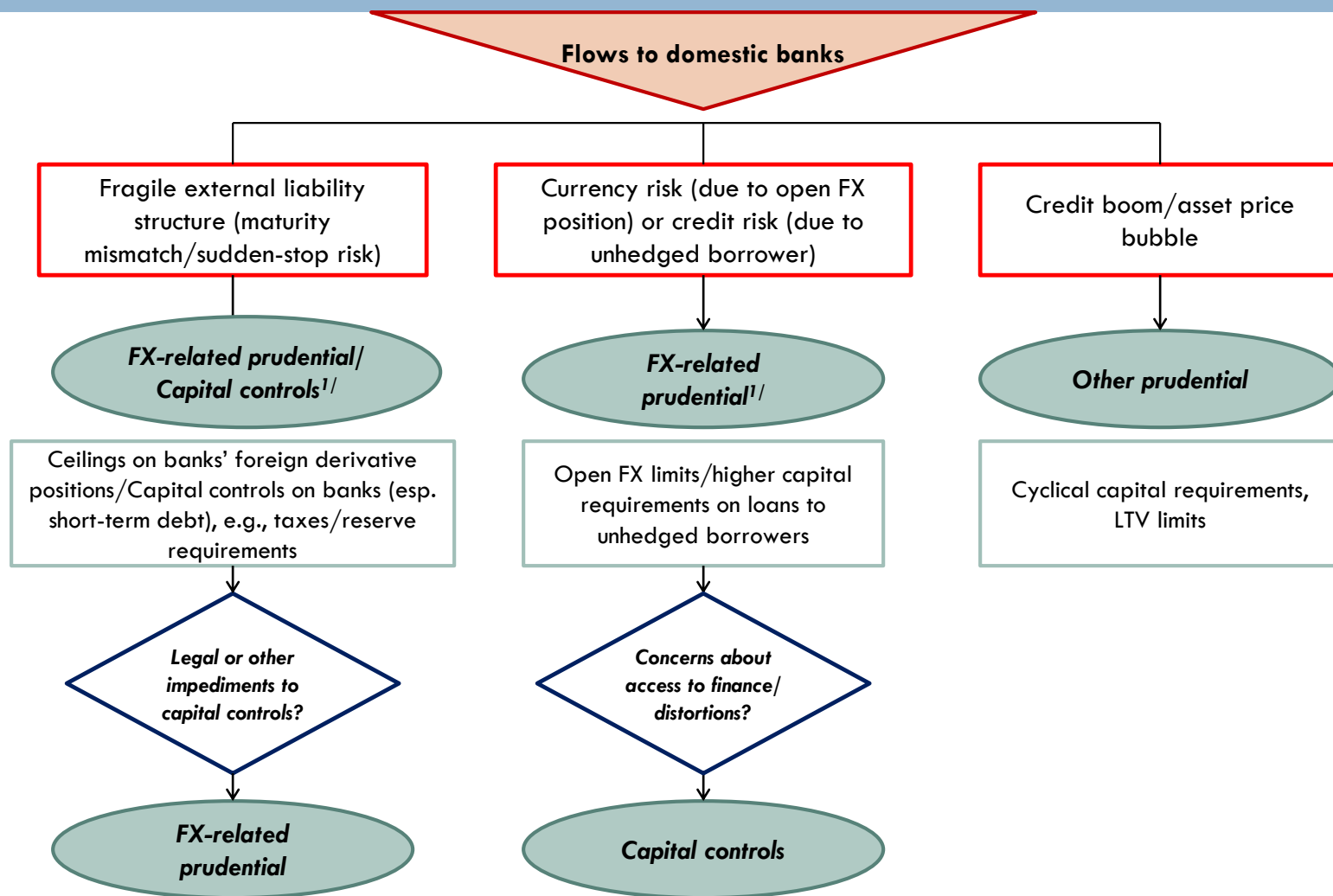
Source: IMF's VEE database.

Notes: Values are annual averages over 2009-12. In the left and right panels, the size of the bubble (and the numbers in parentheses) reflects average annual REER appreciation and banks' foreign liabilities to domestic credit (2009-11), respectively.

# Available Instruments and Assignment to Targets



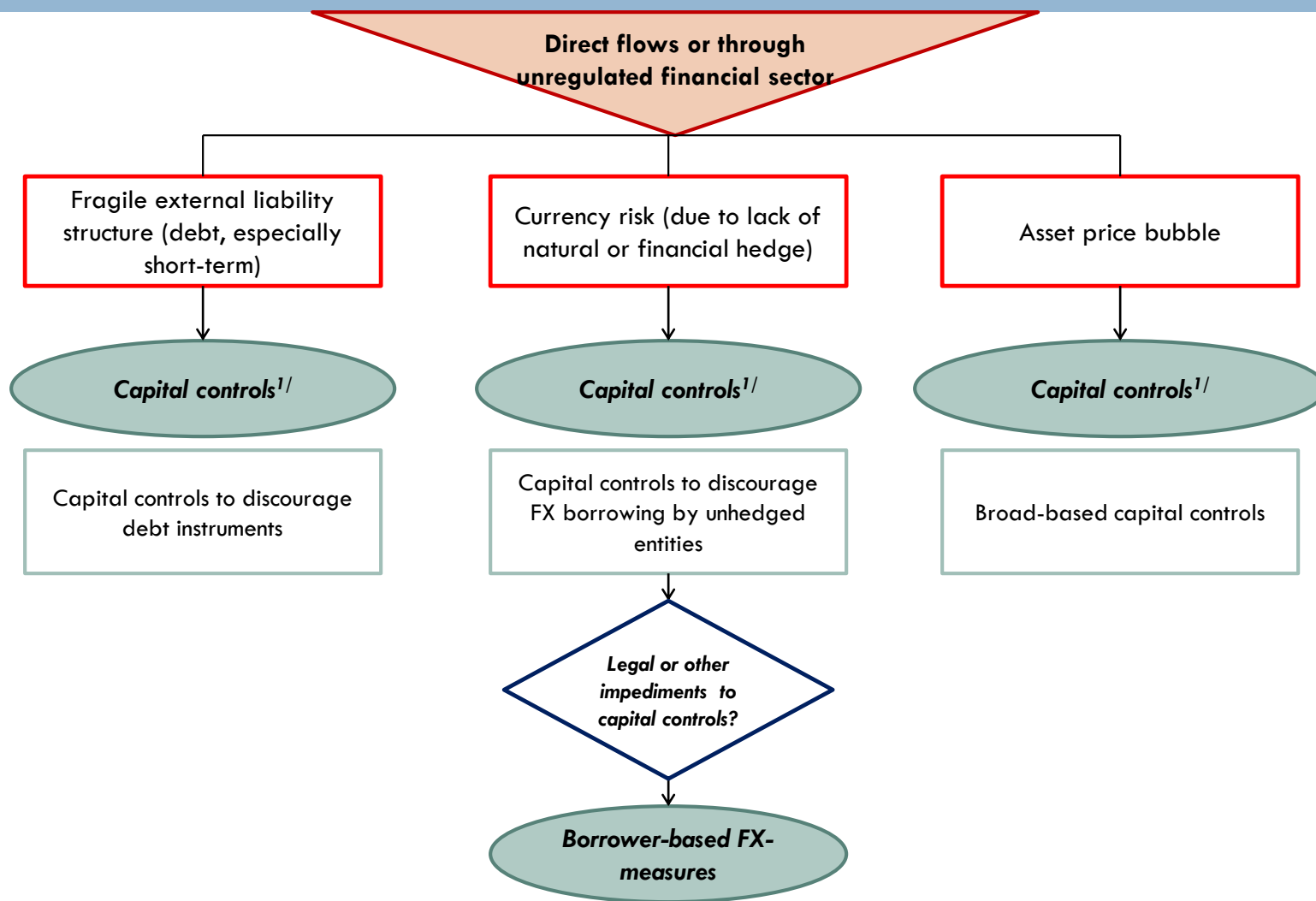
# Choice of Instruments: Flows Intermediated through the Financial Sector



1/ Once macro policy space exhausted, and taking due account of multilateral considerations.



# Choice of Instruments: Flows Not Intermediated through the Financial Sector



1/ Once macro policy space exhausted, and taking due account of multilateral considerations





# Capital Controls or Prudential: No General Ranking

- There is no clear welfare hierarchy between macro-prudential measures and capital controls
- Sometimes macro-prudential measures are superior
  - ▣ When all borrowing is problematic (aggregate credit boom or asset price inflation) irrespective of the source, there is no need to discriminate between domestic and foreign lenders. Optimal policy is a tax on domestic borrowing
- But other times, capital controls may be the best response
  - ▣ When external borrowing has damaging GE effects on domestic NT prices and borrowing constraints (exchange rate channel), authorities should discriminate between foreign and domestic lenders. Optimal policy is capital controls
- When borrowing is channeled through unregulated financial sector instead of regulated banks, macro-prudential tools may not be able to limit risky flows, and broad restrictions on foreign borrowing work better
- In practice, employ both instruments if use of each has convex costs

# ER Management Within the Toolkit

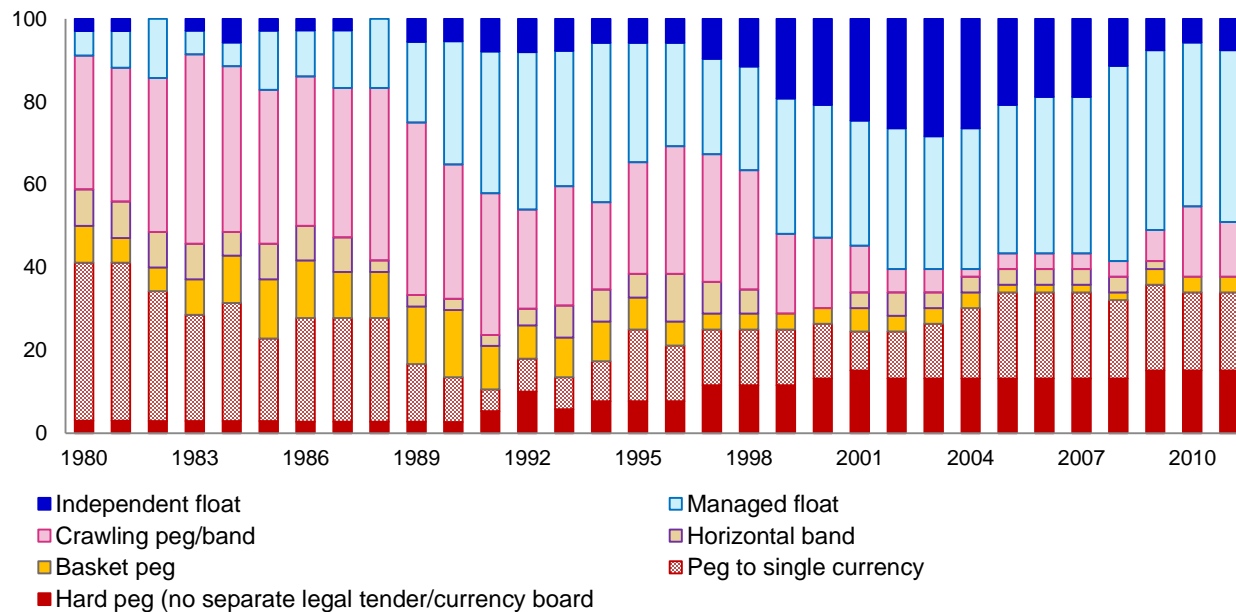
# ER Movements under Floating Can Be Excessive

- Pass-through from ER to inflation is typically higher in EMEs
- ER may move excessively or even in the “wrong” direction
  - Overvaluation poses risk of Dutch disease, leading to dislocations between tradable and non-tradable sectors
  - With FX debt and currency mismatch on domestic balance sheets, depreciation of ER in response to outflows can trigger debt overhang and deleveraging cycle
- ER movements can also become a source of shocks
  - ER can be a shock amplifier rather than a shock absorber
  - Liquid markets require large numbers of participants, who are prone to herding and switches between multiple equilibria; ER movements may predominantly reflect these instead of fundamentals (Jeanne and Rose 2002)
- In all these cases, “benign neglect” of the ER may not be optimal

# In Practice, EMEs Have Moved to Managed Floats

- Conventional wisdom has been the bipolar prescription: adopt floats or hard pegs, avoid intermediate ER regimes
- In practice, EMEs have moved toward managed floats much more than the textbook case would predict

**Distribution of ER Regimes in EMEs: IMF's De Facto Classification, 1980-2011 (in percent)**

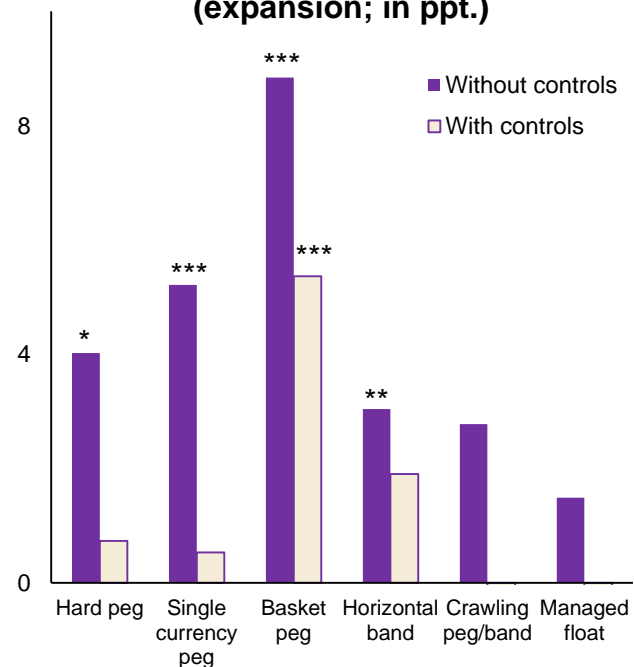


Source: Anderson (2008) and IMF's AREAER

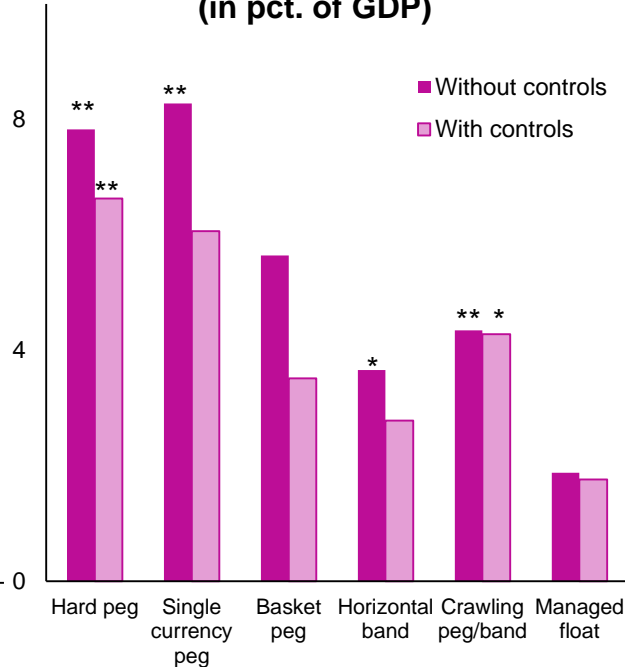
# Managed Floats Seem to Limit Vulnerabilities

## □ Including with respect to ER overvaluation

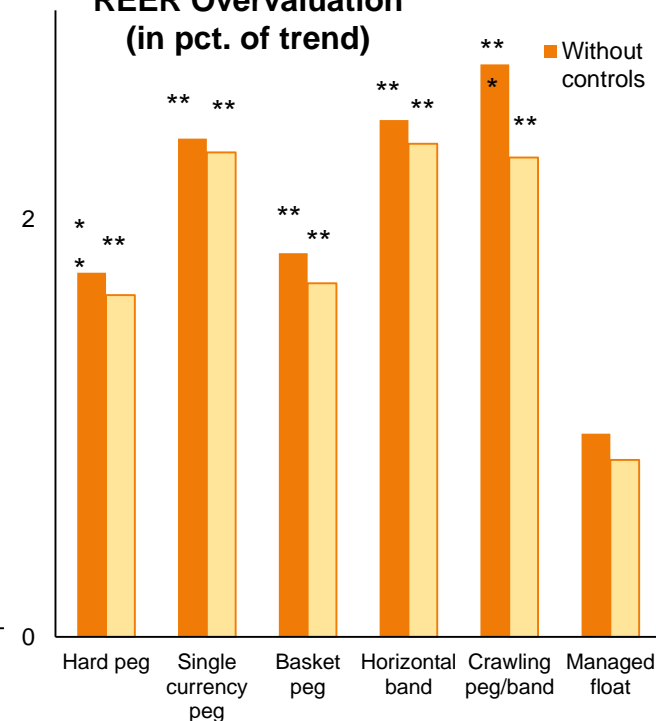
**Change in private credit to GDP (expansion; in ppt.)**



**Banks' Foreign Liabilities (in pct. of GDP)**



**REER Overvaluation (in pct. of trend)**



Note: Without controls includes real GDP per capita, region-specific and time effects. With controls adds real GDP growth, inflation, initial credit/GDP, net capital flows/GDP, bank foreign liabilities/GDP in the left panel; real GDP growth, REER deviation from trend, private credit/GDP in the middle panel; and real GDP growth, inflation, net capital flows/GDP, bank foreign liabilities/GDP right panel. Reference category is free float. \*\*\*, \*\*, and \* indicate statistical significance at 1, 5 and 10 percent levels, respectively.

# And ER Management Has Not Led to Disaster

**Vulnerabilities and Crisis in EMEs: IMF's De Facto Classification, 1980-2011**

	Financial vulnerabilities			Macro vulnerabilities		Crisis <sup>a</sup>			
	Credit boom <sup>b</sup>	Foreign borrowing <sup>b</sup>	FX lending <sup>b</sup>	Fiscal balance <sup>b</sup>	REER deviation <sup>b</sup>	Bank	Currency	Debt	Growth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Hard pegs</b>	<b>6.1</b>	<b>14.3</b>	<b>58.9</b>	<b>-2.7</b>	<b>0.3</b>	<b>3.0</b>	<b>1.0</b>	<b>2.0</b>	<b>10.5</b>
<b>Intermediate</b>	<b>2.4</b>	<b>9.4</b>	<b>36.1</b>	<b>-3.6</b>	<b>0.2</b>	<b>4.7</b>	<b>5.2</b>	<b>1.9</b>	<b>4.4</b>
Peg to single currency	3.5	12.3	34.9	-4.6	0.9	3.6	5.2	2.8	6.9
Basket peg	8.8	10.7	49.2	-1.9	-0.2	5.4	1.1	1.1	8.3
Horizontal band	5.1	9.9	44.5	-4.5	0.6	7.0	2.8	1.4	3.4
Crawling peg/band	1.1	8.3	35.1	-3.4	0.8	7.4	7.4	2.3	3.1
Managed float	1.2	8.0	35.4	-3.5	-0.7	2.7	4.9	1.5	3.3
<b>Independent float</b>	<b>0.8</b>	<b>7.3</b>	<b>29.4</b>	<b>-3.2</b>	<b>-1.6</b>	<b>1.2</b>	<b>2.4</b>	<b>0.6</b>	<b>3.8</b>

a/ In percent of exchange rate regime observations. Bank, currency, and debt crises from Laeven and Valencia (2012). Growth collapses are defined as those that are in the bottom fifth percentile of growth declines (current year relative to the average of the three previous years), and correspond to a fall in the growth rate of real GDP of about 7.5 percentage points. Regimes are lagged one period.

b/ Credit boom measures 3-year cumulative change in ratio of private sector credit to GDP (in percentage points). Foreign borrowing measures bank foreign liabilities/GDP (in percent). FX lending measures ratio of FX bank loans to total bank loans (in percent). Fiscal balance measures general govt. net lending/GDP (in percent). REER deviation measures deviation of REER from trend (in percent of trend).

- **Managed floats: Lower vulnerabilities and fewer crises than other intermediates, and not much more crisis-prone than pure floats**
- **How the ER is managed is important – moving the ER closer toward equilibrium helps, while keeping the ER overvalued increases vulnerability to crisis**

# Is Managed Float Compatible with IT? Yes

- “Two Targets, Two Instruments” framework (Ostry et al. 2012)
- Key question: Does ER management endanger hard-won credibility of IT framework?
- “Caricature” textbook IT would call for completely ignoring the ER, beyond its effect on inflation
  - ▣ Multiple objectives can conflict and undermine IT credibility
- But benign neglect has never been an option for EMEs
  - ▣ Theoretical literature acknowledges that EMEs have a host of reasons to worry about ER movements
  - ▣ In practice, EME central banks did, and do, keep an eye on the ER

# How do EME ITers Conduct Policy?

- Estimate Taylor Rules targeting real policy rate: ( $i$  – inflation target)
- Controls include:
  - Lagged dependent variable
  - Consensus forecast for inflation over next 4 quarters – inflation target
  - Change in real effective exchange rate
  - Output gap, measured as deviation from rolling HP Trend
  - Dummy for global financial crisis
- Consistent with IT framework, ITers increase target real policy rate in response to higher expected inflation
- 10 percent REER appreciation lowers policy rate by 0.40 ppts
  - Effect over and above any impact of ER on expected inflation
- Policy rate responds to output gap
  - 1 percent output gap persisting for 4 quarters raises policy rate by 0.40 ppts
- Global financial crisis dummy captures sharp reduction in policy rates



# Taylor Rule in EME ITers: Exchange Rate Matters

Table 1. Taylor Rules in Emerging Market Country Inflation Targeters: Panel Regression <sup>1/</sup>

	Dependent Variable: policy rate - inf. target		
	(1)	(2)	(3)
Lagged (policy rate - inflation target)		0.854 *** [0.020]	0.870 *** [0.023]
Expected inflation - inflation target	1.328 *** [0.209]	0.462 *** [0.059]	0.441 *** [0.047]
Change in REER			-0.040 *** [0.012]
Lagged output gap			0.120 *** [0.030]
Dummy for Global Financial Crisis	0.820 * [0.414]	-0.933 ** [0.361]	-0.977 ** [0.353]
Country Fixed Effects	YES	YES	YES
Observations	654	640	640
R-squared	0.250	0.887	0.899
Number of Countries	15	15	15

<sup>1/</sup> Standard errors in brackets. \*, \*\* and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively. REER is defined such that an increase denotes an appreciation of the currency.

# And So Too for FX Intervention in EME ITers

- 10 percent REER appreciation is associated with 2.5 percent increase in reserves among ITers and 5.6 percent among non-ITers

Table 2. Change in Reserves as a function of change in REER <sup>1/</sup>

	Change in Reserves	
	IT	Non-IT
Change in REER	0.252 ** [0.088]	0.564 ** [0.195]
Dummy for Global Financial Crisis	-1.948 [2.167]	-12.301 ** [4.454]
Country Fixed Effects	YES	YES
Observations	646	520
R-squared	0.031	0.054
Number of Countries	15	10

<sup>1/</sup> Standard errors in brackets. \*, \*\* and \*\*\* denote statistical significance at the 10, 5 and 1 percent level, respectively. REER is defined such that an increase denotes an appreciation of the currency.

- Another measure of degree of intervention is:  $\sigma_{\text{Reserves}} / (\sigma_{\text{Reserves}} + \sigma_{\text{REER}})$ 
  - Ratio is 0.61 for EME ITers, fairly comparable to 0.76 for non-ITers

# Does Sterilized Intervention in EMEs Work?

- Does sterilized intervention work? Literature points to two channels:
  - ▣ Portfolio balance channel: Intervention affects ER by changing relative supply of domestic and foreign currency assets; this channel is likely ineffective in AEs, but can be effective in EMEs because intervention can amount to significant share of local bond markets
  - ▣ Signaling channel: Intervention affects expectations about future fundamentals, including stance of monetary policy; not clear a priori whether this channel should be stronger for EMEs
- Evidence on effectiveness of sterilized intervention in EMEs is mixed, but generally more favorable than for AEs
  - ▣ Effect on ER volatility more robust than effect on ER level; this may be enough to help counter the effects of temporary surges in capital inflows
  - ▣ Interventions more likely to be effective in context of already overvalued ER
  - ▣ Less effective in countries with more open capital accounts

# Literature Finds Some Evidence In Favor

## Studies on Sterilized Intervention in Emerging Market Economies

Study	Country	Effectiveness on	
		Level	Volatility
Stone, Walker, and Yosuke (2009)	Brazil	Yes	Yes
Tapia and Tokman (2004)	Chile	Yes	
Mandeng (2003)	Colombia		Yes (mixed)
Kamil (2008)	Colombia	Yes (weak)	Yes
Holub (2004)	Czech Republic	Mixed	
Disyatat and Galati (2005)	Czech Republic	Yes (weak)	No
Barabás (2003)	Hungary	Mixed	
Pattanaik and Sahoo (2003)	India	Yes (weak)	Yes
Rhee and Song (1999)	Korea	Yes	
Domaç and Mendoza (2002)	Mexico and Turkey	Yes	Yes
Guimarães and Karacadag (2004)	Mexico and Turkey	Yes (weak)	Mixed
Abenoja (2003)	Philippines	Mixed	Yes (mixed)
Sangmanee (2003)	Thailand	No	
Adler and Tovar (2011)	Mainly Latin America	Yes	

# Modeling Two Targets-Two Instruments

- Our key assumption is that UIP does not hold
  - ▣ Capital flows respond to expected return differentials but at finite pace:

$$\Delta k_t = \gamma_r (r_t - r_t^* + (e_{t+1}^e - e_t))$$

- AD depends on  $r$  and  $e$ :  $y_t = -\phi_r r_t - \phi_e e_t - u_t$

- AS given by “surprise inflation” Phillips curve:  $y_t = \pi_t - \pi_t^e$

- Current account depends on  $e$  and  $y$ :  $ca_t = -\phi_e e_t - \phi_y y_t$

- BOP equation implies current account plus capital flows equal change in reserves:  $ca_t + \Delta k_t = \theta \Delta R_t$

- To simplify algebra, we assume:  $\phi_r = \phi_e = \gamma_r = \theta = 1$      $\phi_e = \phi_y = 0$

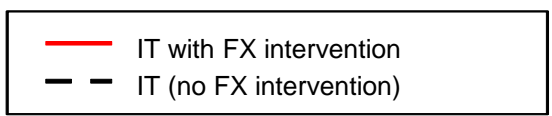
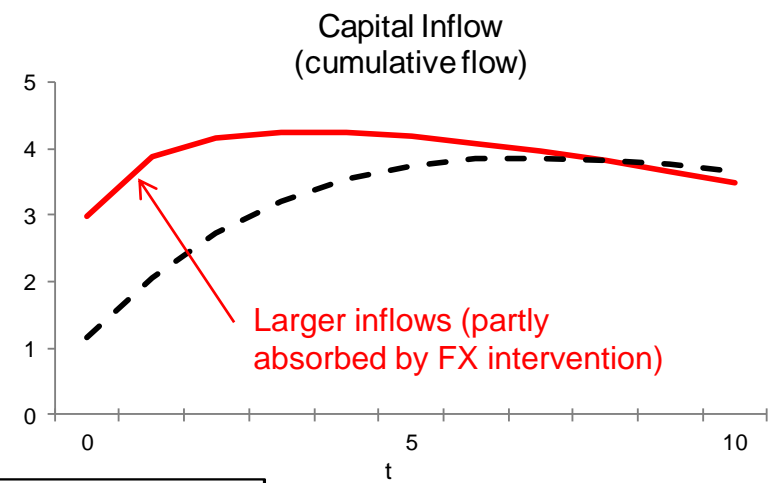
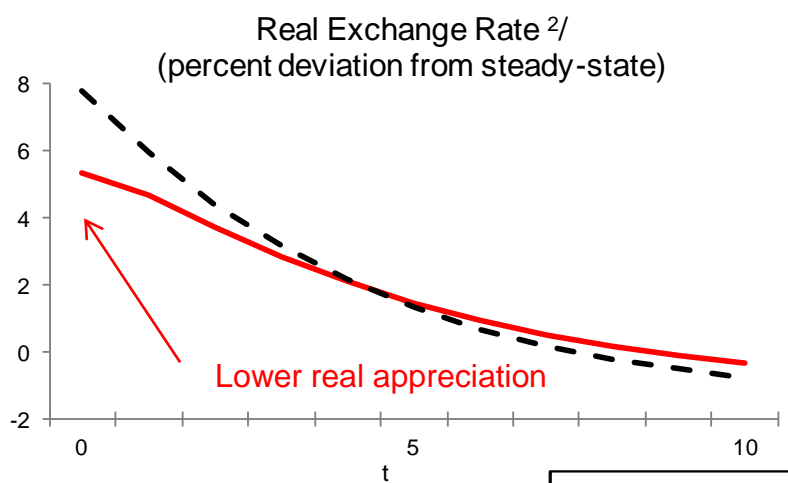
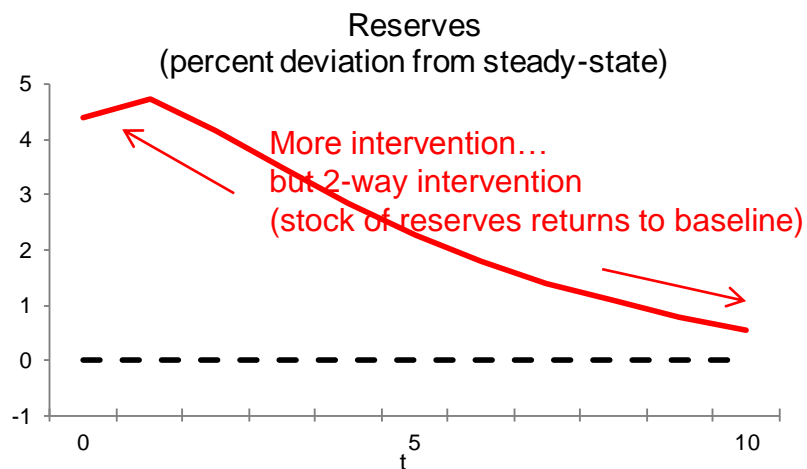
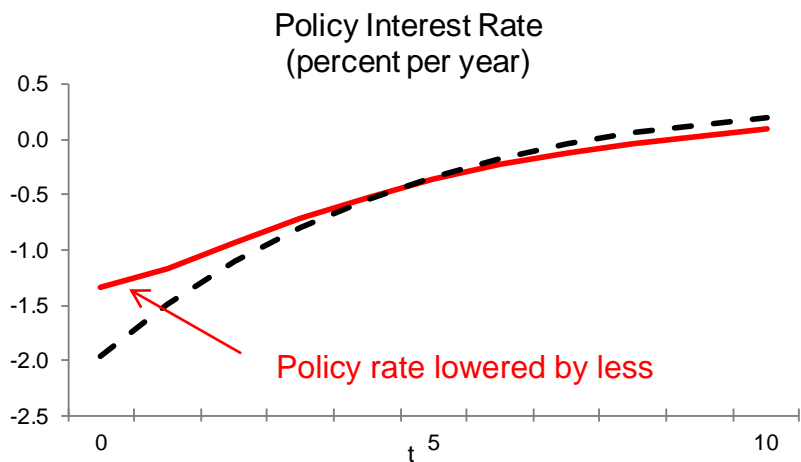
- CB cares about square deviations of  $p$ ,  $y$ ,  $e$  and  $R$  from steady-states:

$$W = \text{Max}_{r,R} -\frac{1}{2} \{ (y - \bar{y})^2 + a(\pi)^2 + b(e)^2 + cR^2 \}$$

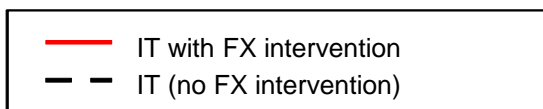
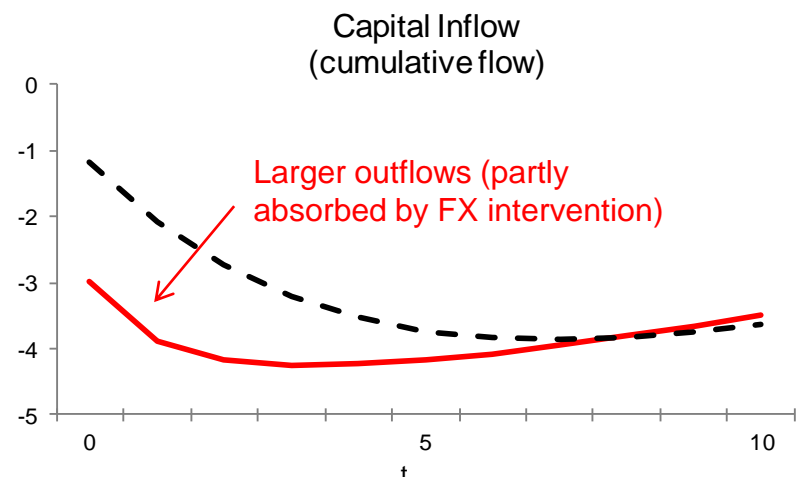
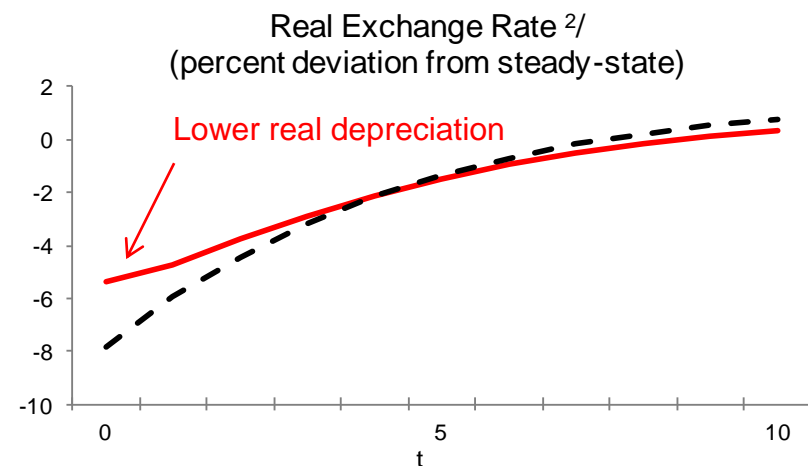
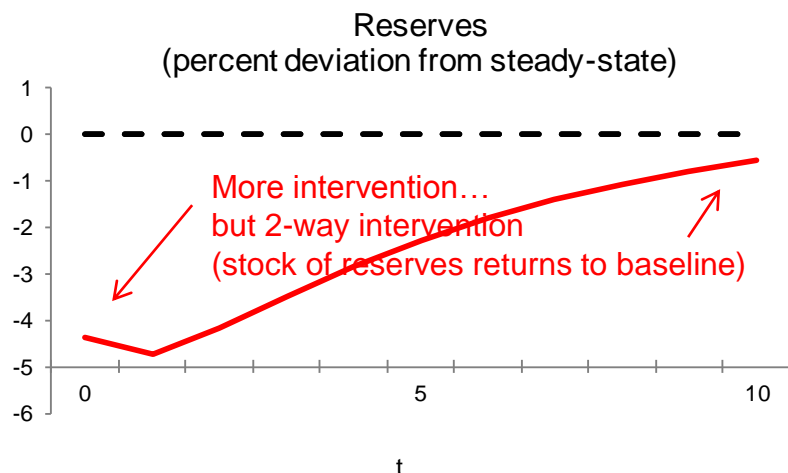
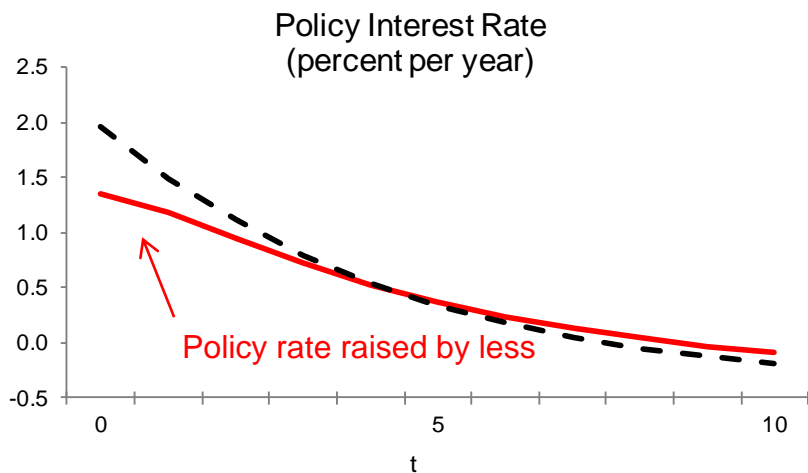
- IT modeled as a constraint that sets:  $\boldsymbol{\pi} = \mathbf{0}$

- CB free to smooth shocks to  $y$ ,  $e$ , and  $R$ , provided that IT is met

# Using Two Instruments to Respond to Capital Inflow Shock



# Using Two Instruments to Respond to Capital Outflow Shock



# Key Takeaways

- Agree on the paper's message that ER flexibility is important, but it alone is not enough when policymakers have multiple targets
- Agree there is a need for more instruments beyond the ST policy rate
- One instrument that deserves more emphasis in the paper is FX intervention
  - ER management through FX intervention is likely to be an important tool for EMEs to achieve their objectives
  - “Benign neglect” of the ER not an option for most EMEs
  - EMEs have not followed the bipolar prescription, and with good reason: managed floats offer many of the benefits of floats, with few of the costs of soft pegs
- FX intervention has a larger role when:
  - The shock to inflows is less persistent
  - Inflows are less sensitive to the return differential
- No reason why caring about ER will undercut credibility of IT framework, provided interventions are subordinated to delivering the inflation objective

Having ER goals but claiming to float freely is not a credibility-enhancing policy

