

A TIE THAT BINDS: REVISITING THE TRILEMMA IN EMERGING MARKET ECONOMIES

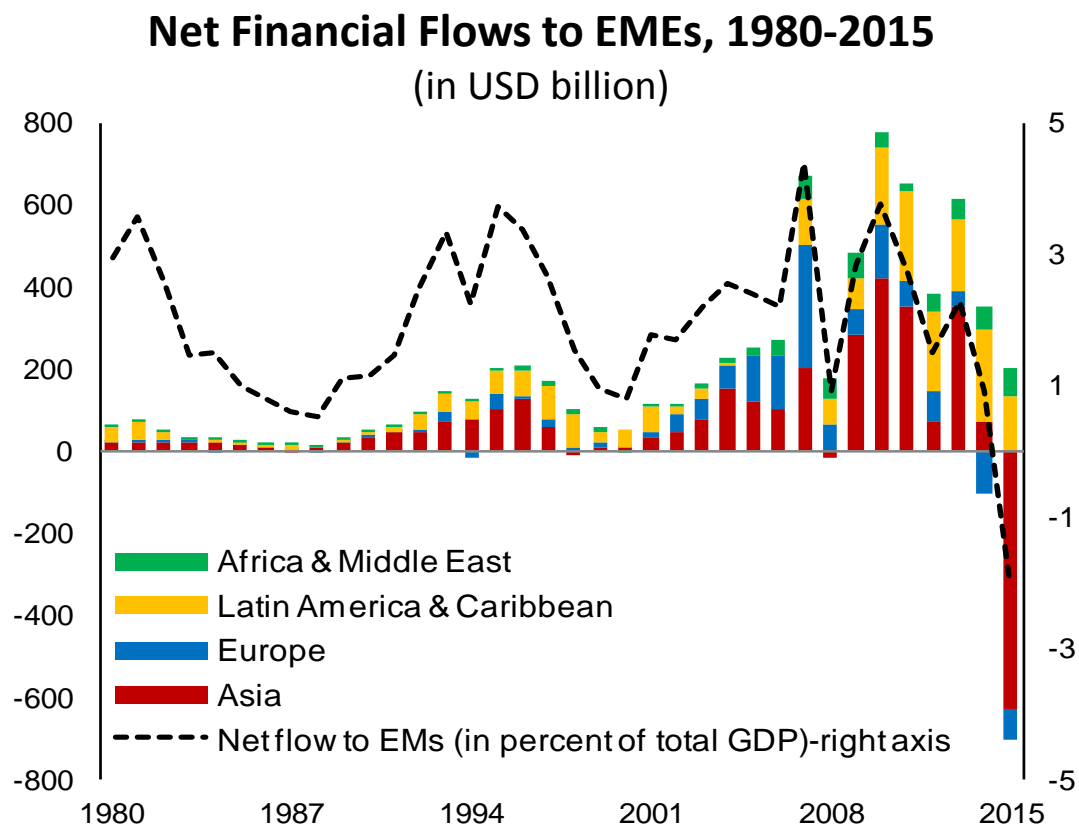
Maurice Obstfeld*
International Monetary Fund

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MOTIVATION

INCREASINGLY VOLATILE CAPITAL FLOWS TO EMEs

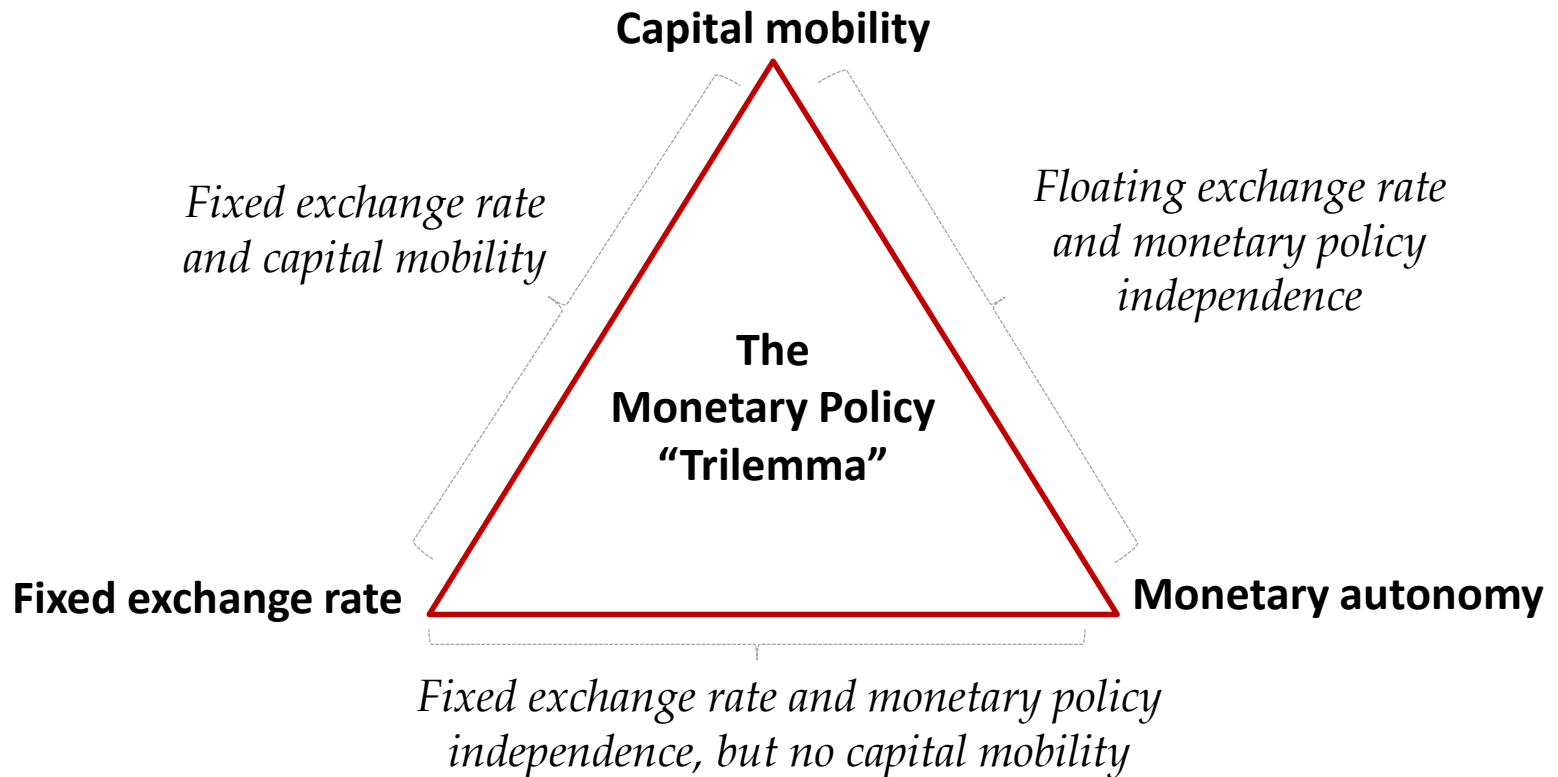


Source: IMF's WEO database.

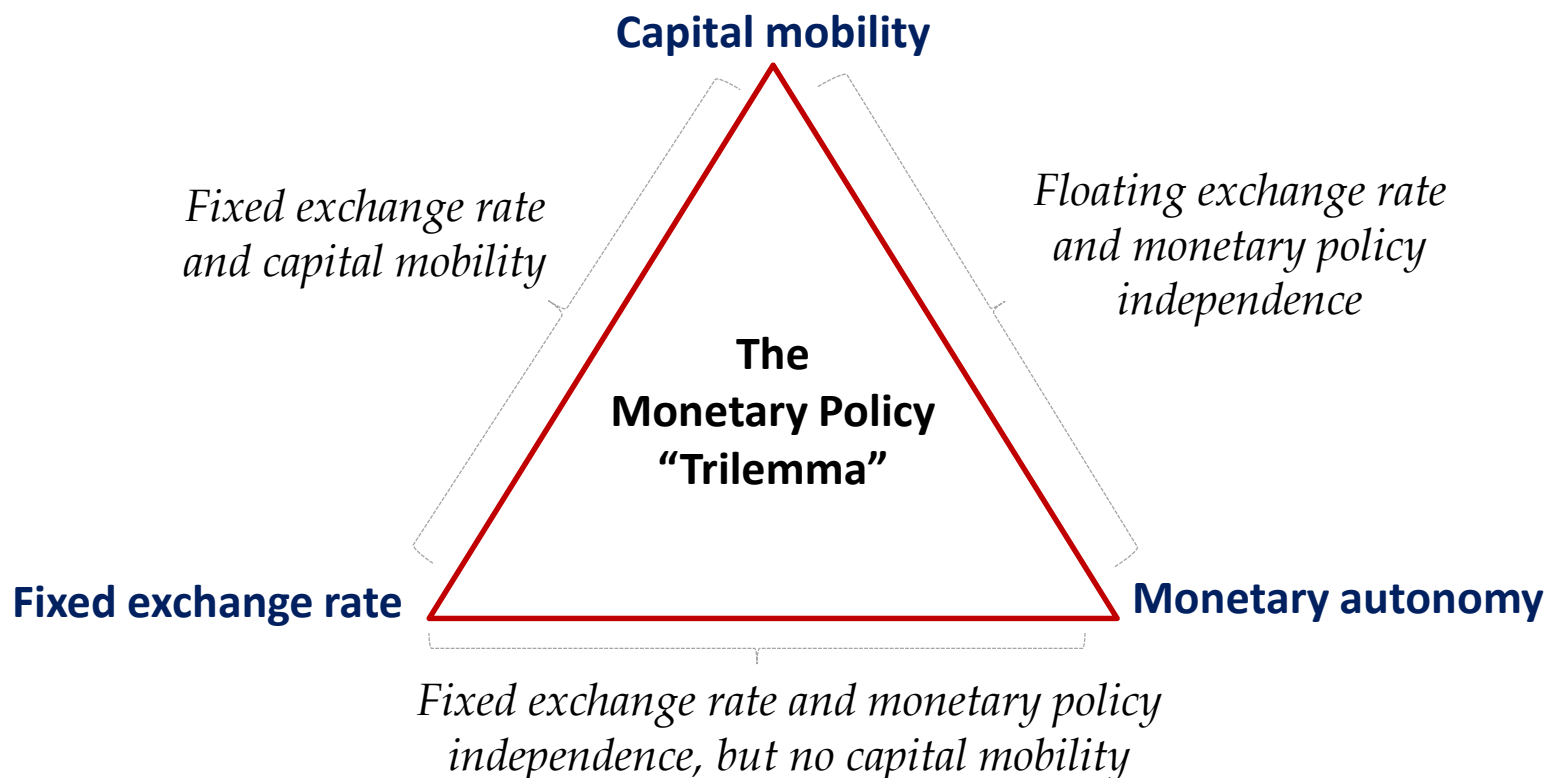
Note: Net financial flows exclude reserve assets. Figures for 2015 are provisional. Net flow in percent of GDP is the average across countries.

- Debate on cross-border financial spillovers, and policy options to manage capital flows—in particular, the role of the exchange rate (ER)

TRILEMMA OR DILEMMA?



TRILEMMA OR DILEMMA?



“Exchange rate flexibility in recipient countries sometimes exacerbates booms rather than equilibrates.” - Raghuram Rajan (2014)

“There is a global financial cycle in capital flows, asset prices and in credit growth... Whenever capital is freely mobile, the global financial cycle constrains national monetary policies *regardless* of the exchange rate regime.” - Hélène Rey (2013)

DO EXCHANGE RATE REGIMES MATTER?

- Large literature on whether floating exchange rates assure monetary policy autonomy in financially-open economies
 - General finding: short-term interest rates are *less* correlated with base country rates under flexible ER regimes than under fixed ER regimes (Frankel et al., 2004; Obstfeld et al., 2005; Klein & Shambaugh, 2015; Caceres et al. 2016; Bekaert & Mehl, 2017)
- Limited evidence on whether the capacity of central banks to set policy rates under flexible ER regimes implies ability to influence domestic financial conditions in financially-open economies
 - Rey (2016); Passari and Rey (2015) argue that it does not...
- Effectiveness of monetary policy may be limited in open economies as:
 - Borrowers may substitute between domestic and external financing sources
 - Long-term interest rates tend to be influenced by global forces across exchange rate regimes (Obstfeld, 2015)
 - Flexible exchange rate could amplify the boom-bust cycle through leverage dynamics (Bruno & Shin, 2014; Cesa-Bianchi et al., 2017)

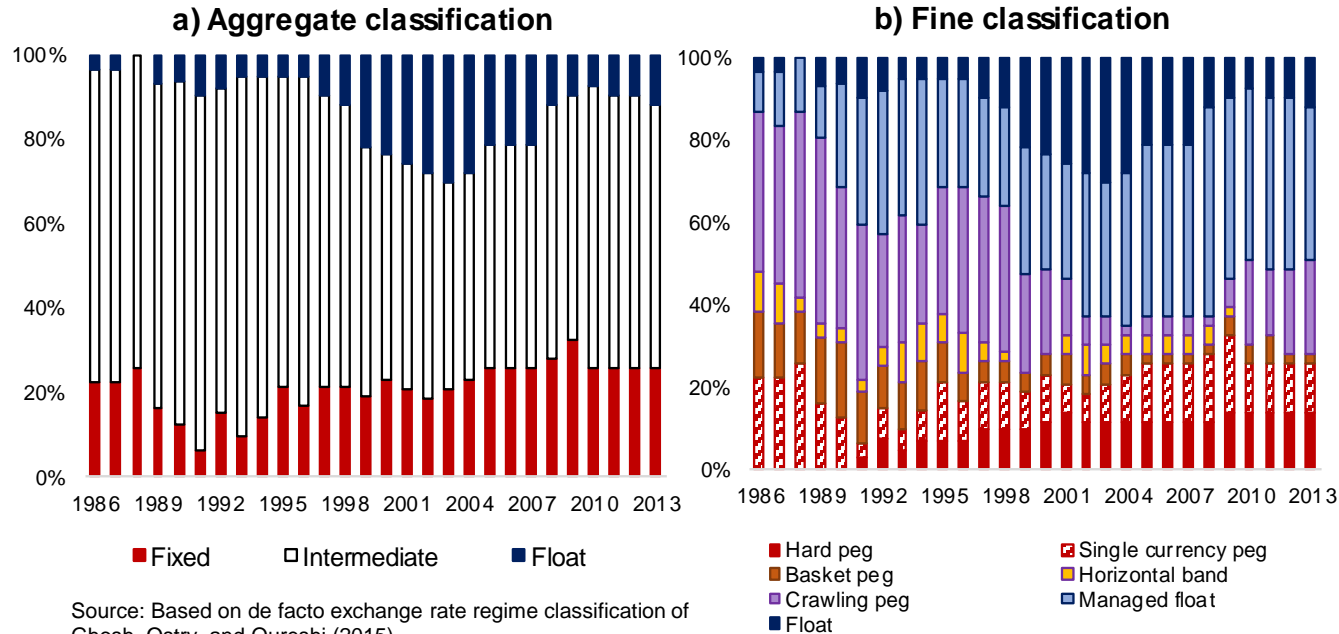
WHAT DO WE DO

- Examine the significance of ER regimes in the transmission of global financial conditions to domestic financial and real conditions in EMEs
- Focus on:
 - Financial variables (domestic credit growth, risky asset prices—housing and equities, banking sector leverage)
 - Capital flows: Net and gross flows; FDI, portfolio, and other investment flows
 - Output growth and volatility
- Use aggregate and disaggregate ER regime classifications for 43 EMEs over 1986-2013
- Why focus on EMEs?
 - Policy debates concerning the transmission of global financial shocks from the center to the periphery mostly relate to the experience of EMEs
 - Advanced economies tend to experience the global financial cycle asymmetrically to EMEs given their tendency to receive safe-haven flows during risk-off periods
 - Less cross-country variation in regimes in AEs: Eurozone fixed or float?
 - Inferences drawn from the analysis of AEs could thus be misleading

STYLIZED FACTS

RICH DIVERSITY OF EXCHANGE RATE REGIMES IN EMEs

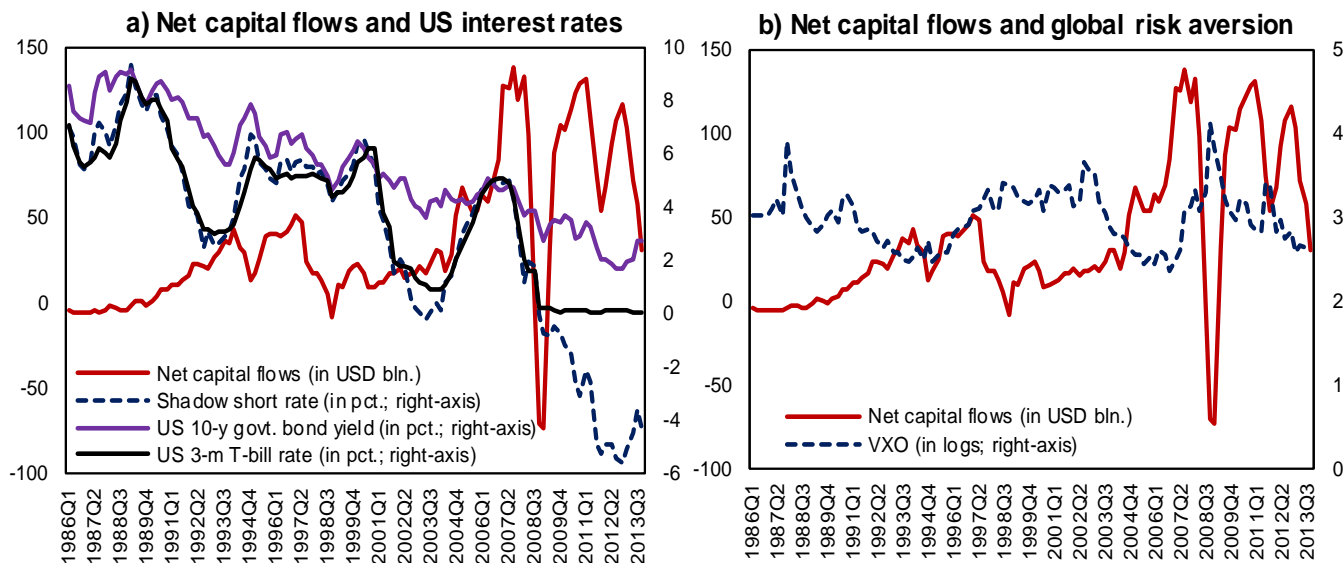
De Facto Exchange Rate Regimes in EMEs, 1986–2013



- In 2013, 26 percent of EMEs in the sample have a fixed ER regime (hard or conventional peg to a single currency), 63 percent are intermediate regimes (basket pegs, crawls, bands, managed floats), while remaining are pure floats
- Within intermediate regimes, vast majority are managed floats
- The “hollowing out” trend of intermediate regimes reversed around 2004, with increased adoption of managed floats

CAPITAL FLOWS TIGHTLY CORRELATED WITH GLOBAL FACTORS

Global Factors and Capital Flows to EMEs, 1986Q1–2013Q4



Sources: IFS database, Bloomberg, and Krippner (2013).

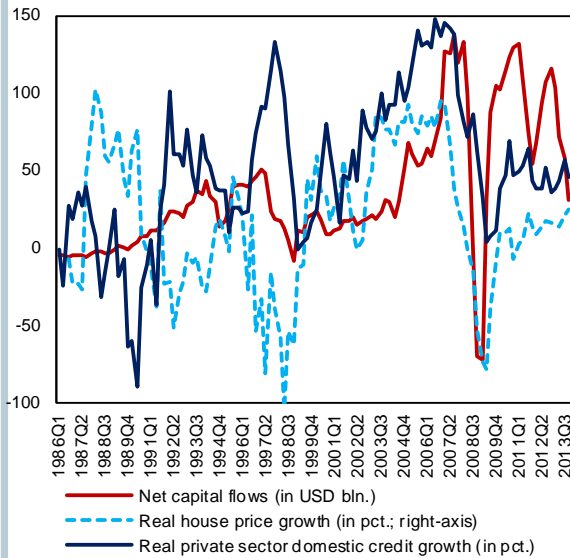
Notes: Figures present three quarter moving average of flows. Net capital flows exclude other investment liabilities of the general government and reserve assets. Flows are presented in BPM5 terms with positive (negative) numbers indicating inflows (outflows).

- Net capital flows to EMEs surge when U.S. interest rates and global risk aversion (proxied by the VXO index) are low, and recede when they are high
- Much of this negative correlation is the result of liability (nonresident) flows
- Correlation of asset flows with both U.S. interest rates and the VXO index is positive \Rightarrow residents tend to invest abroad when global financial conditions are favorable, but retrench when conditions tighten

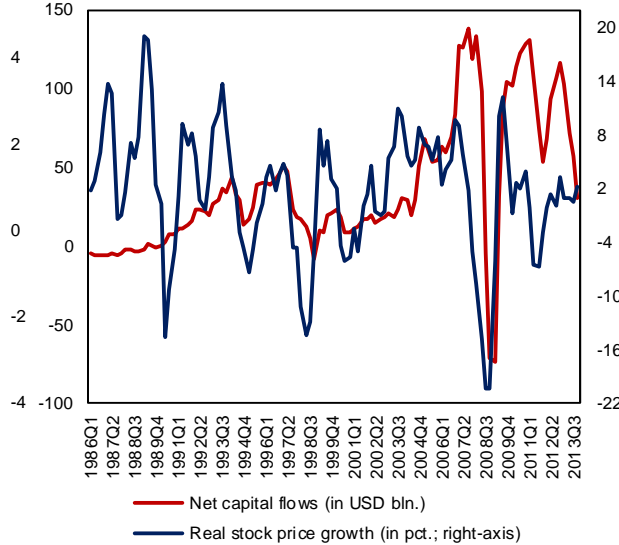
FINANCIAL CONDITIONS ALSO CORRELATED WITH GLOBAL FACTORS

Global Risk Aversion, Capital Flows and Financial Variables in EMEs

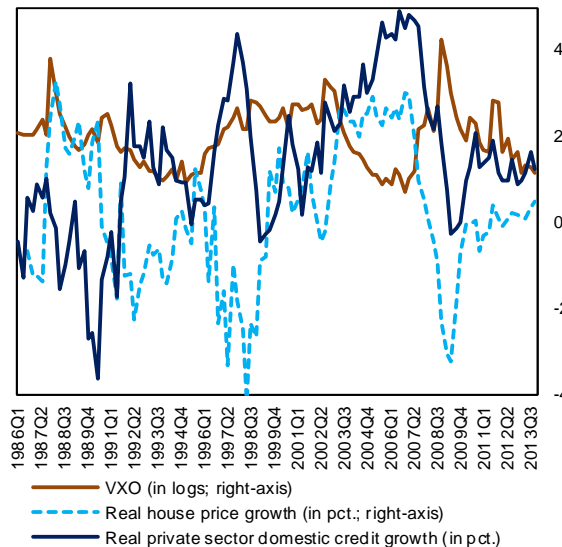
a) Net capital flows, credit, and house prices



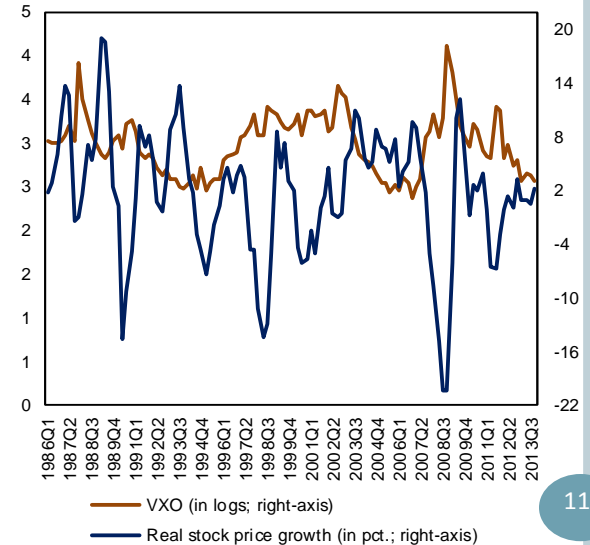
b) Net capital flows and stock prices



c) Global risk aversion, credit, and house prices



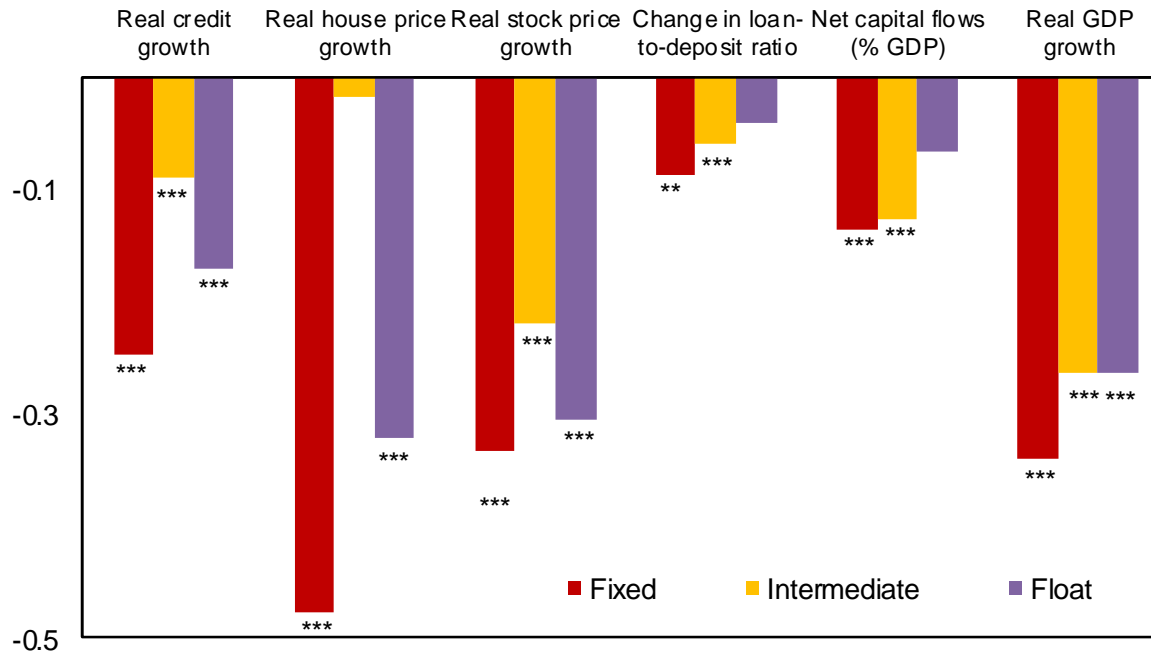
d) Global risk aversion and stock prices



BUT THE CORRELATION DIFFERS BY EXCHANGE RATE REGIME

Correlation of Financial and Macroeconomic Variables in EMEs

a) With Global Investor Risk Aversion

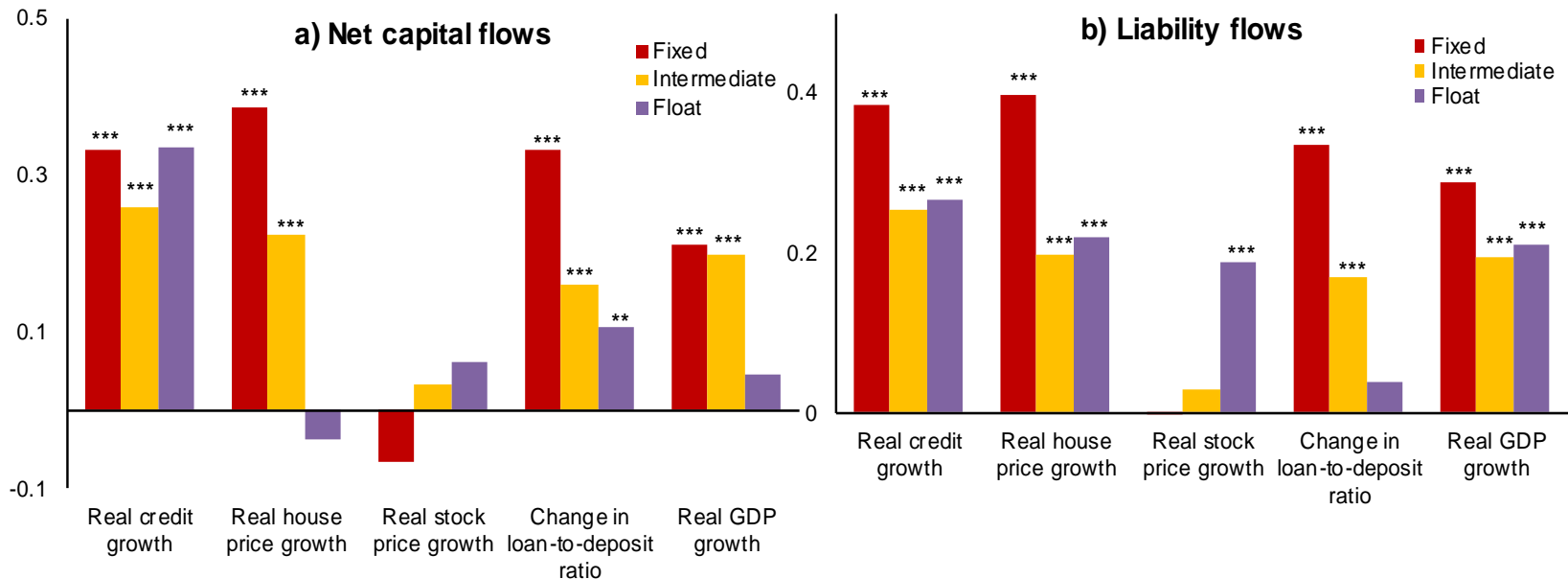


Note: Figure shows the unconditional correlation across countries between the (log) VXO index and three-quarter moving average of real domestic private sector credit growth, real house price growth, real stock price growth, change in loan-to-deposit ratio, net capital flows to GDP, and real GDP growth. *, **, *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively.

BUT THE CORRELATION DIFFERS BY EXCHANGE RATE REGIME

Correlation of Financial and Macroeconomic Variables in EMEs

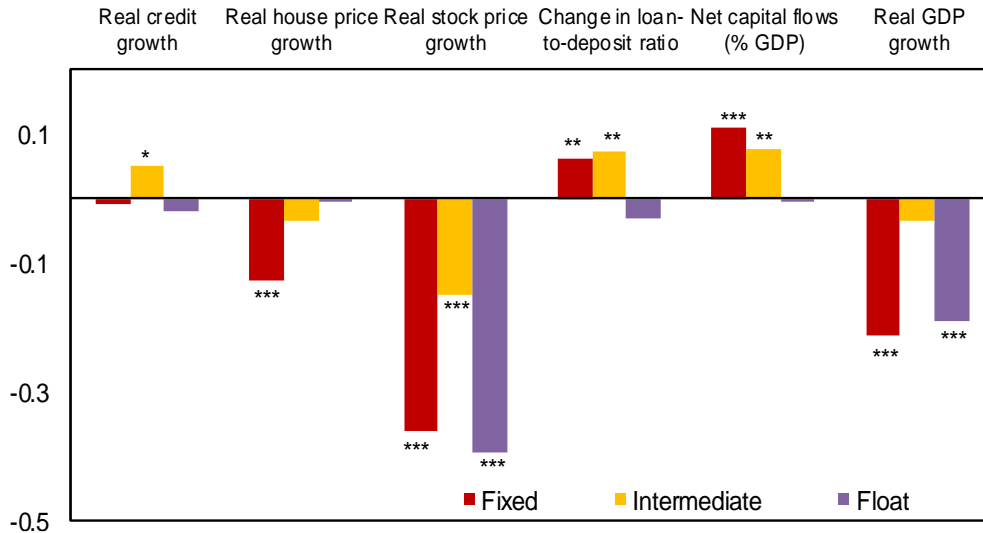
b) With Capital Flows



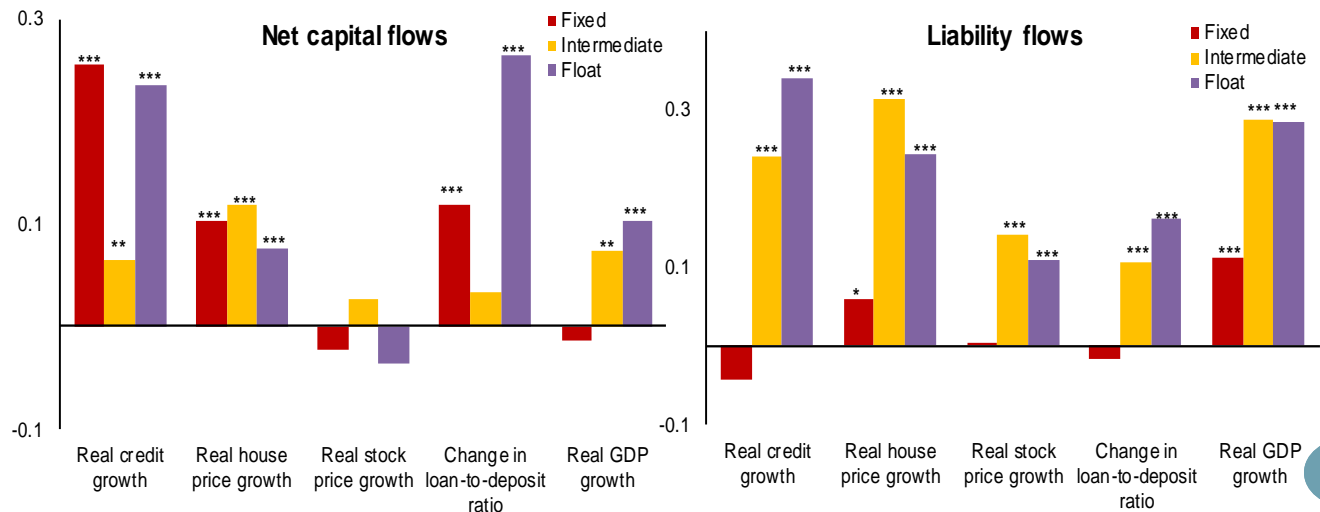
Note: Figure shows the unconditional correlation between three-quarter moving average of net and liability flows, and real domestic private sector credit growth, real house price growth, real stock price growth, change in loan-to-deposit ratio, net capital flows to GDP, and real GDP growth. *, **, *** indicate statistical significance at the 10, 5, and 1 percent levels, respectively.

NO CLEAR PATTERN IN ADVANCED ECONOMIES...

a) Correlation with Global Investor Risk Aversion in AEs



b) Correlation with Capital Flows in AEs



ESTIMATION RESULTS

EMPIRICAL STRATEGY

○ Estimate using quarterly data:

$$(1) f_{i,t} = \beta_0 + \beta_1 \text{Fixed}_{it} + \beta_2 \text{Int}_{it} + \beta_3 \text{VXO}_t + \beta_4 \text{Fixed}_{it} \times \text{VXO}_t + \beta_5 \text{Int}_{it} \times \text{VXO}_t + \sum_k \lambda_k z_{it,k} + \mu_i + \varepsilon_{it}$$

$$(2) f_{i,t} = \beta_0 + \beta_1 \text{Fixed}_{it} + \beta_2 \text{Int}_{it} + \beta_3 \text{VXO}_t + \beta_4 \text{Fixed}_{it} \times \text{VXO}_t + \beta_5 \text{Int}_{it} \times \text{VXO}_t + \sum_k \lambda_k z_{it,k} + \mu_i + \eta_t + \varepsilon_{it}$$

- $f_{i,t}$: financial variable (domestic credit growth, house price growth, stock market return, change in loan-to-deposit ratio); capital flows; output growth
- *Fixed* and *Int*: dummy variables for fixed/intermediate ER regimes
- *VXO* (in logs): proxy for global financial shocks
- *z*: relevant control variables; μ : country-fixed effects; η quarter-year effects
- Coefficients of interest: β_3 , β_4 , and β_5
- Include at least partially open economies (measured by Quinn-Toyoda capital account openness index) in the sample

○ Endogeneity concerns?

- Exchange rate regimes slow-moving variables
- Drop financial crisis observations (Laeven & Valencia, 2015) from the sample
- Use lagged values of domestic control variables
- Extensive robustness checks

GLOBAL FINANCIAL CONDITIONS AND CREDIT GROWTH

- Domestic credit growth is strongly negatively related to the VXO
 - One s.d. increase in (log) VXO lowers credit growth by about 0.6 ppt (mean quarterly domestic credit growth rate is 2 percent)
- Fixed ER regimes have, on average, 3 ppt higher credit growth than floats
- But fixed exchange rate regimes are also more affected by changes in VXO
 - One s.d. shock to (log) VXO implies about 1 ppt lower real credit growth in fixed regimes as compared to more flexible regimes (average quarterly credit growth in fixed and floating regimes is about 2 and 1 percent, respectively)
- By contrast, intermediate regimes are significantly less affected than fixed regimes ⇒ may reflect the less binding constraints imposed on monetary policy in such regimes
- Using disaggregated ER regime classification shows the negative response of credit growth to the VXO is strong for hard pegs and conventional pegs
- Results do not hold for AEs: no systematic difference across ER regimes

GLOBAL FINANCIAL CONDITIONS, ASSET PRICES, AND LEVERAGE

- ER regime also matters significantly for house price movements in EMEs
 - Fixed ER regimes experience faster real house price growth than floats
 - Sensitivity of house prices to changes in the VXO is greater under fixed ERs \Rightarrow one s.d. increase in (log) VXO implies about 1.5-2 ppt larger reduction in house price growth
 - Negative response is stronger for hard pegs and conventional pegs
- ER regime seems less relevant for stock market returns in EMEs
 - Real equity returns are strongly negatively related to the VXO
 - But no statistically significant difference in response across ER regimes
 - Lack of differential response for stock prices could be because of lack of association with domestic credit growth (by contrast, house prices are strongly affected by domestic credit growth, and also react more to the VXO in fixed ER regimes)
- Banking system leverage (loan-to-deposit ratio) affected by ER regime
 - Fixed ER regimes, on average, experience faster leverage growth than other regimes
 - De-leveraging with negative global financial shocks is also greater in fixed regimes
 - One s.d. increase in (log) VXO implies a decrease in leverage growth by about 1 ppt in fixed rate regimes compared to floats

GLOBAL FINANCIAL CONDITIONS AND CAPITAL FLOWS

- Capital flows are a key channel of transmission of global financial shocks
 - Fixed and intermediate ER regimes both attract more net flows than floats...
 - And react more when the global financial cycle turns
 - One s.d. shock to (log) VXO implies about 2 pct. and 0.5 pct. lower flows in fixed and intermediate ER regimes, respectively
- Liability flows differ markedly across ER regimes, while asset flows do not
 - Foreign investors are more likely to invest in pegs than in more flexible ER regimes; but they are also more skittish under such regimes when global risk aversion rises
 - Differential impact of global financial conditions on liability flows exists for hard pegs, single currency pegs, and basket pegs
 - Both portfolio and other investment liability flows react strongly to the VXO—falling sharply as global risk aversion rises, and vice versa—but FDI flows remain stable
 - Sensitivity of portfolio flows to the VXO is, however, not affected by the ER regime, but other investment liability flows react more strongly to the VXO in fixed ER regimes as compared to intermediate regimes or floats

GLOBAL FINANCIAL CONDITIONS AND OUTPUT

- Real output growth in EMEs declines as the VXO rises
 - One s.d. deviation shock to the VXO implies a 0.2 ppt decline in the growth rate (against a mean quarterly growth rate of 1 pct. across ER regimes)
- Decline in output is double for fixed ER regimes compared to both intermediate regimes and floats
 - One s.d. shock to the VXO lowers output growth rate by about 0.4 ppt in fixed ER regimes relative to others
- Similar results for the volatility of quarterly growth rate (3 or 5-quarter rolling s.d. of real GDP growth rate): fixed ER regimes experience significantly greater output volatility than floats when VXO rises
- Insulation properties afforded by flexible exchange rates can materially reduce the costs to EMEs from global financial shocks
 - Nevertheless, the insulation is not perfect—global financial conditions still get transmitted to domestic macroeconomic conditions even under flexible ER regimes

SENSITIVITY ANALYSIS

- Alternative specifications and samples
 - Additional control variables; focusing on major or fully open EMEs; excluding outlier observations of financial variables; shorter sample period (2000-13)
- Alternative ER regime classifications
 - Reinhart and Rogoff's de facto classification; officially announced de jure classification
- Addressing potential endogeneity concerns
 - *Omitted variables*: (i) augment specification with interaction terms between ER regimes and several control variables (institutional quality, credit to GDP ratio, capital account openness, commodity prices); (ii) orthogonalize the ER regime and VXO variables with respect to possibly correlated regressors
 - *Reverse causality*: (i) exclude all (and not only crisis) years when ER regime switched; (ii) consider only those countries for which no switch happened
- Results are generally robust to these range of tests

CONCLUSION

- Exchange rate regimes *do* matter
 - EMEs with fixed exchange rates are more prone to experiencing financial vulnerabilities such as rapid credit, house price, and bank leverage growth
 - Response of domestic financial conditions to external financial shocks is magnified under fixed exchange rate regimes as compared to floating regimes
 - Net capital flows in fixed exchange rate regimes react more to global financial shocks—behavior largely driven by liability flows suggesting that foreign investors react more when the equilibrating role of exchange rate is constrained
 - Flexible exchange rates act as an effective buffer for the real economy
- Differential impact of global shocks is greatest for rigid exchange rate regimes, managed floats are not too different from pure floating regimes
 - Normatively relevant when policy makers have multiple targets that can be more easily achieved with managed floats than pure floats
- Nevertheless, insulation may not be perfect suggesting the need to invoke other policy tools to achieve macro-financial stability goals in the face of volatile capital flows

Thank you