Capital Flows at Risk: Taming the Ebbs and Flows

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A New Risk Management Framework for Capital Flows

- Capital flows to emerging markets (EMs) remain highly volatile, with both inflow surges and sudden stops entailing risks

- Interested in **characterizing, forecasting and monitoring over time the entire distribution** of capital flows to EMs

  ➢ How do countries' structural characteristics and policy frameworks shape this distribution?
  ➢ How do policy actions taken today affect the likelihood of large outflows and inflow surges tomorrow?
  ➢ What is their impact over different time horizons?

- But capital flow determinants are typically studied within frameworks focusing on mean outcomes or arbitrary tail episodes within logit-type models...

A New Risk Management Framework for Capital Flows

- In the spirit of the growth-at-risk methodology (Adrian et al., 2019), we propose a quantile regression approach to estimate the entire conditional probability distribution of **expected future portfolio flows** as a function of:

  - prevailing (mostly exogenous) global financial conditions,
  - predetermined domestic macro-financial and structural characteristics, and
  - prevailing policy shocks

- Why a QR? **"Typical"** and **"extreme"** in/outflows may reflect different driving forces

- To address **endogeneity concerns**, the analysis of policies is based on well-identified policy shocks—e.g., residuals from estimated policy rules (Brandao-Marques et al, 2020)

- Estimated probability densities of future portfolio flows **facilitate a quantitative evaluation and forecasting of risks** to portfolio flows.
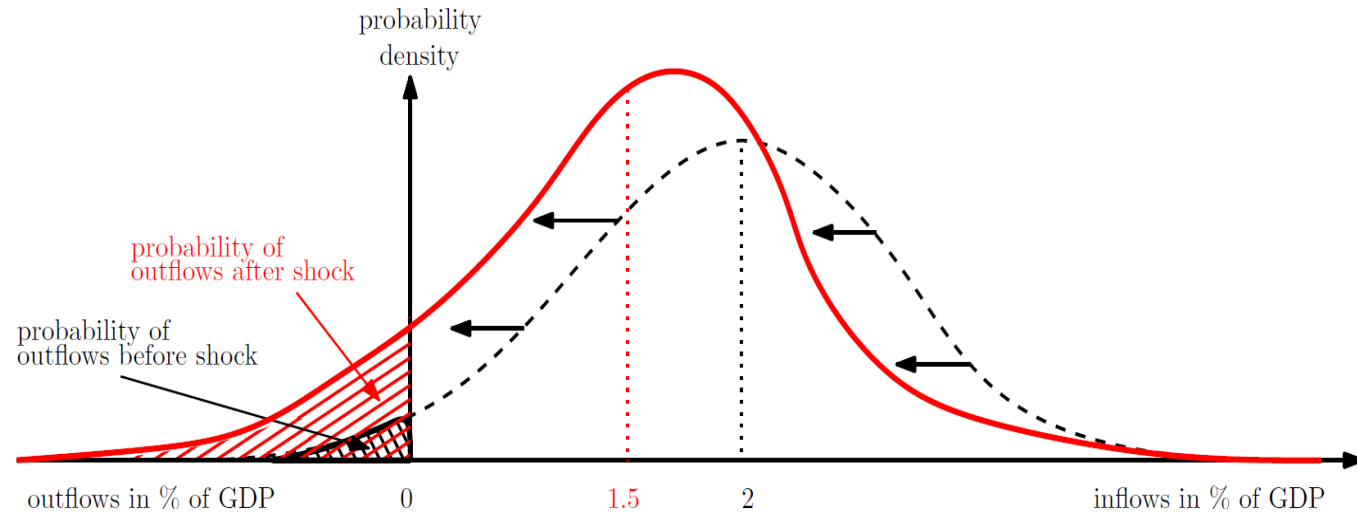
A Surveillance Tool for Monitoring Capital Flows Risk

1) Monitoring Capital Flows Risks: Shift in predicted density after a shock
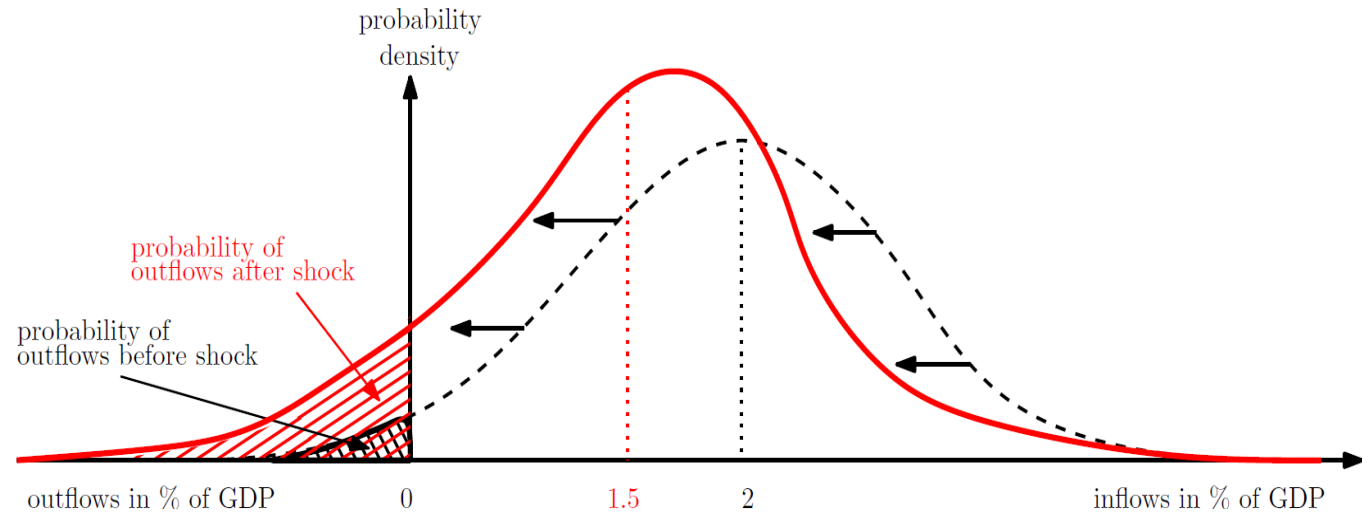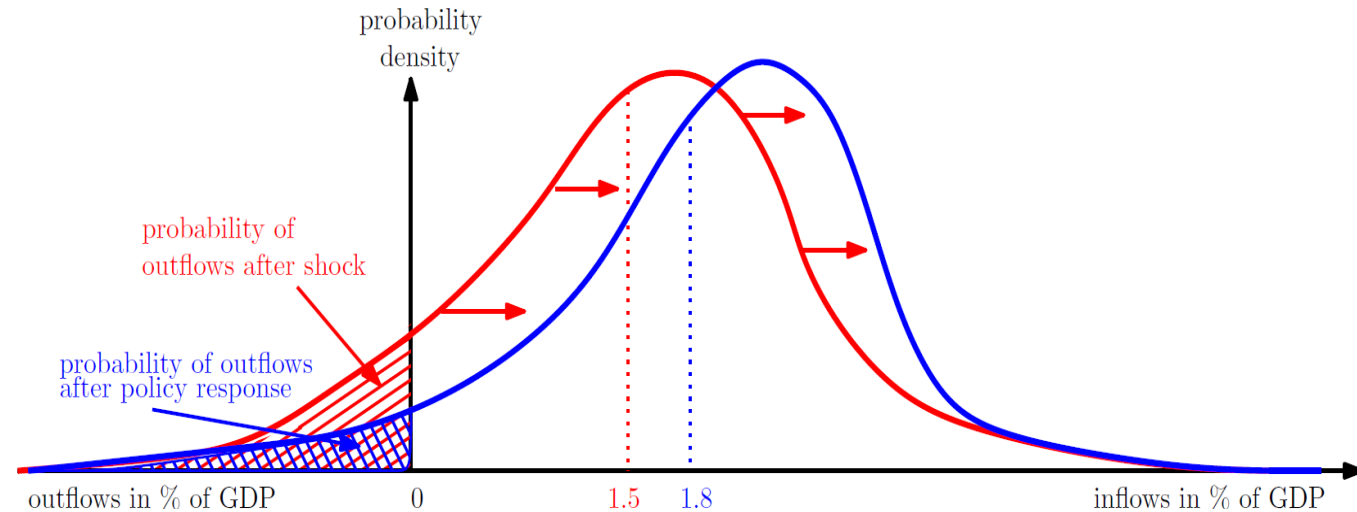
A Surveillance Tool for Managing Capital Flows Risk

1) Monitoring Capital Flows Risks: Shift in predicted density after a shock

2) Managing Capital Flows Risks: Domestic policies and resilience to global shocks

Several Empirical Applications

A new approach to predict the future probability distribution of capital flows to emerging markets

EM aggregate analysis:	Panel analysis:	Country-specific analysis:
Investor asset class	**Multilateral**	**Bilateral**
Outlook, (tail) risk monitoring, role of external drivers	Role of external, domestic drivers and policy actions	Outlook, drivers, (tail) risk monitoring, scenario analysis

Empirical Strategy

- *Estimate future portfolio flows using quantile regression framework*

(1) $\bar{y}^{\alpha}_{i,t+h-j:t+h|t} = \delta^{\alpha}_i + \beta^{\alpha}_1 External_t + \beta^{\alpha}_2 Domestic_{i,t} + \beta^{\alpha}_3 Pol_{i,t} + \beta^{\alpha}_4 (External_t \times Pol_{i,t}) + \epsilon_{it'}$

   where $\bar{y}^{\alpha}_{i,t+h-j:t+h|t}$ stands for average gross portfolio inflows (in percent of GDP) to country i between quarters *t+h-j* and *t+h,* and $\alpha = 5, 10 \dots 90, 95$ stands for the percentile used in the quantile regression.

   ▸ "Short term": average inflows in the first and second quarters ahead.

   ▸ "Medium term": average inflows over the quarters 5–8 ahead.

- Fit empirical distribution to skewed-t probability distribution (Azzalini and Capitani, 2003)

Deeper financial markets are associated with a higher likelihood of a strong rebound in capital flows...

Fin. market development and shock to US corporate yield: short term
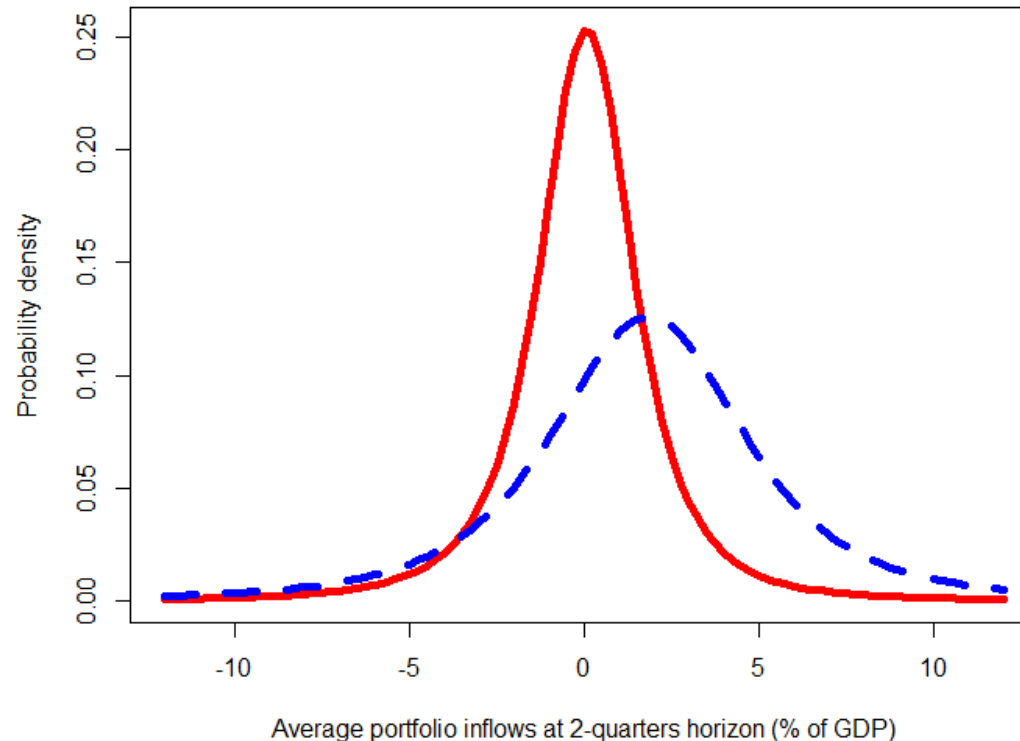
Distribution of short-term portfolio inflows after a global shock when:
financial markets are shallow vs financial markets are well developed

...better domestic institutions do not seem to matter in short run but are associated with higher median flows in the medium term...
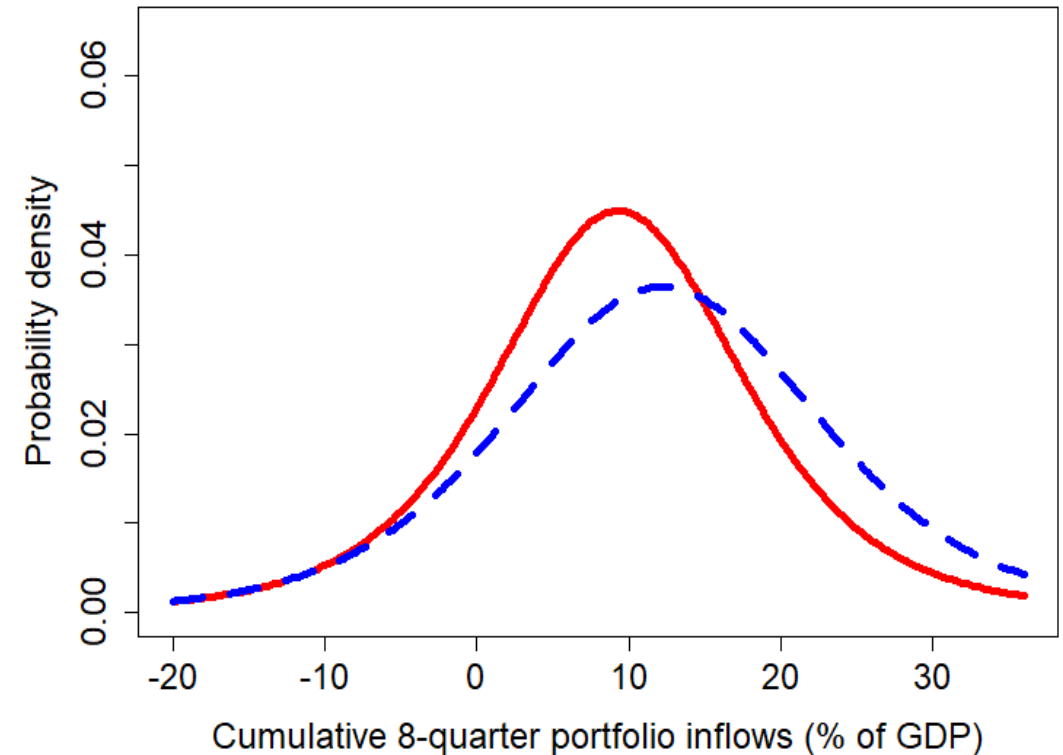

Rule of Law and shock to US corporate yield
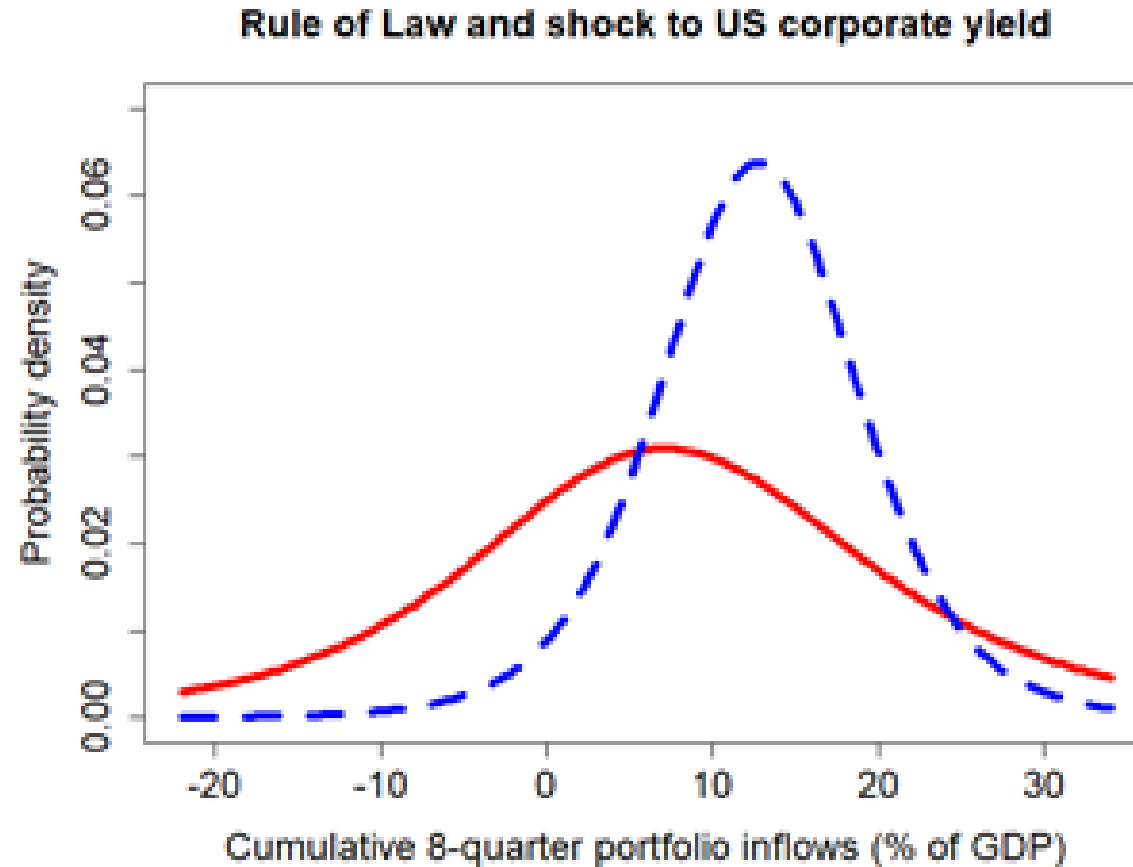
Distribution of medium-term portfolio inflows after a global shock when:
institutional quality is low vs institutional quality is high

...while greater exchange rate flexibility involves an intertemporal trade-off.
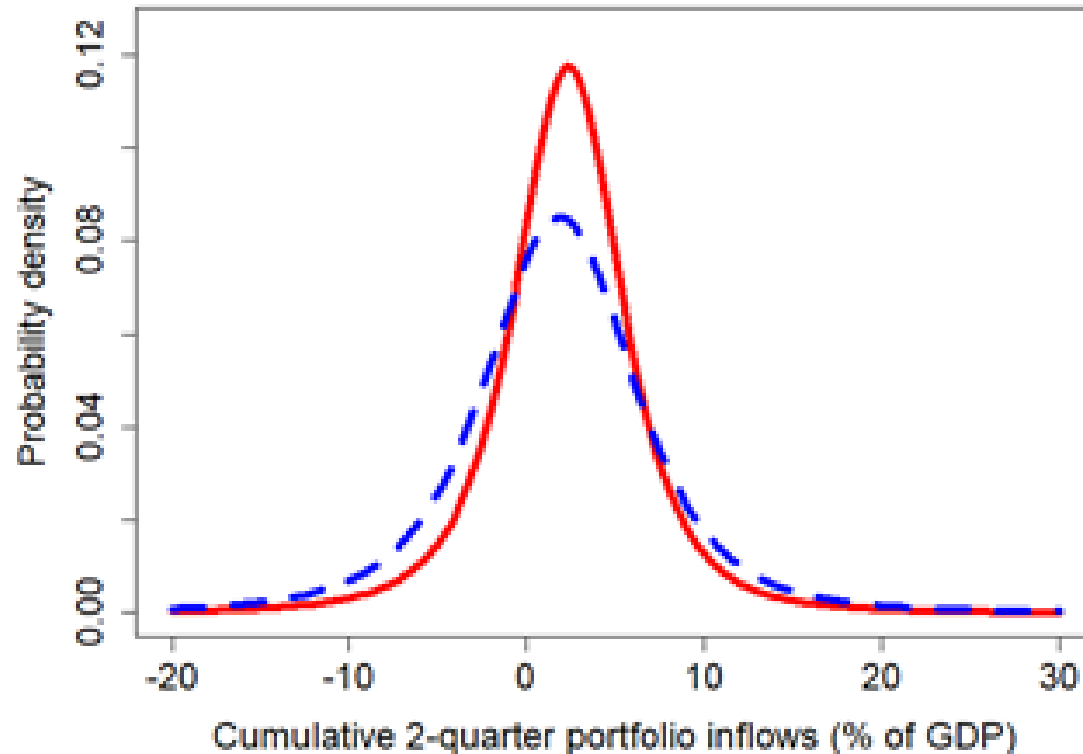
Distribution of short- and medium-term portfolio inflows after a global shock when:
exchange rate is more rigid vs exchange rate is more flexible

Assessing the Mitigating Role of Policies

- *Can policies shield EMs from the impact of global/external factors?*

- To keep the model parsimonious, we focus on changes in the U.S. corporate BBB spread and add policy shocks one at a time:

(2) $\bar{y}^{\alpha}_{i,t+h-j:t+h|t} = \delta^{\alpha}_i + \beta^{\alpha}_1 External_t + \beta^{\alpha}_2 Domestic_{i,t} + \beta^{\alpha}_3 Pol_{i,t} + \boldsymbol{\beta^{\alpha}_4}(External_t \times Pol_{i,t}) + \epsilon_{it}$

  $\boldsymbol{\beta^{\alpha}_4 > 0}$: policy $P_{i,t}$ reduces the impact of a higher BBB spread on portfolio inflows.

- Control for domestic and U.S. GDP growth (de-trended), GDP per capita, degree of CA openness, degree of financial market development, intl. commodity prices, FX reserve position as a ratio to short-term debt in foreign currency

Empirical Evidence on Mitigating Role of Policies
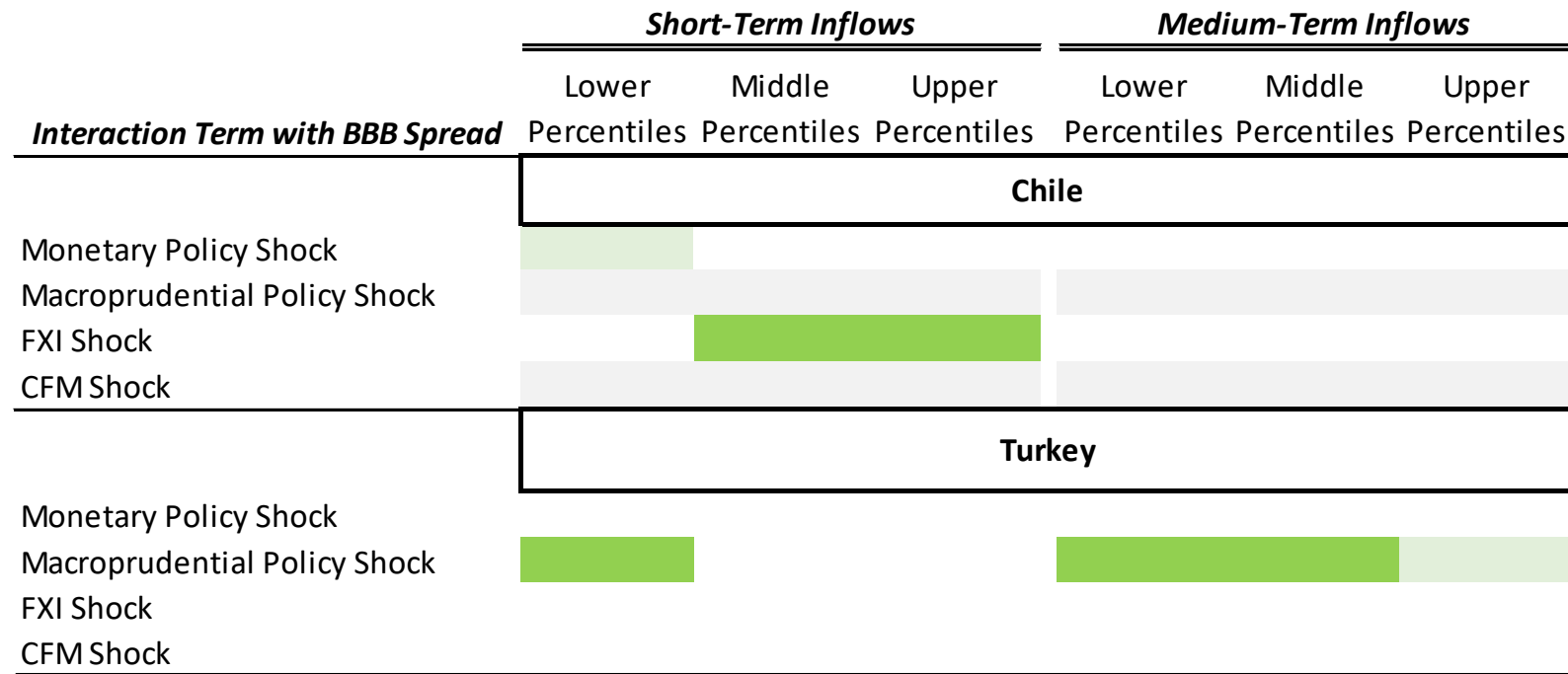
Macropru easing and shock to US corporate yield
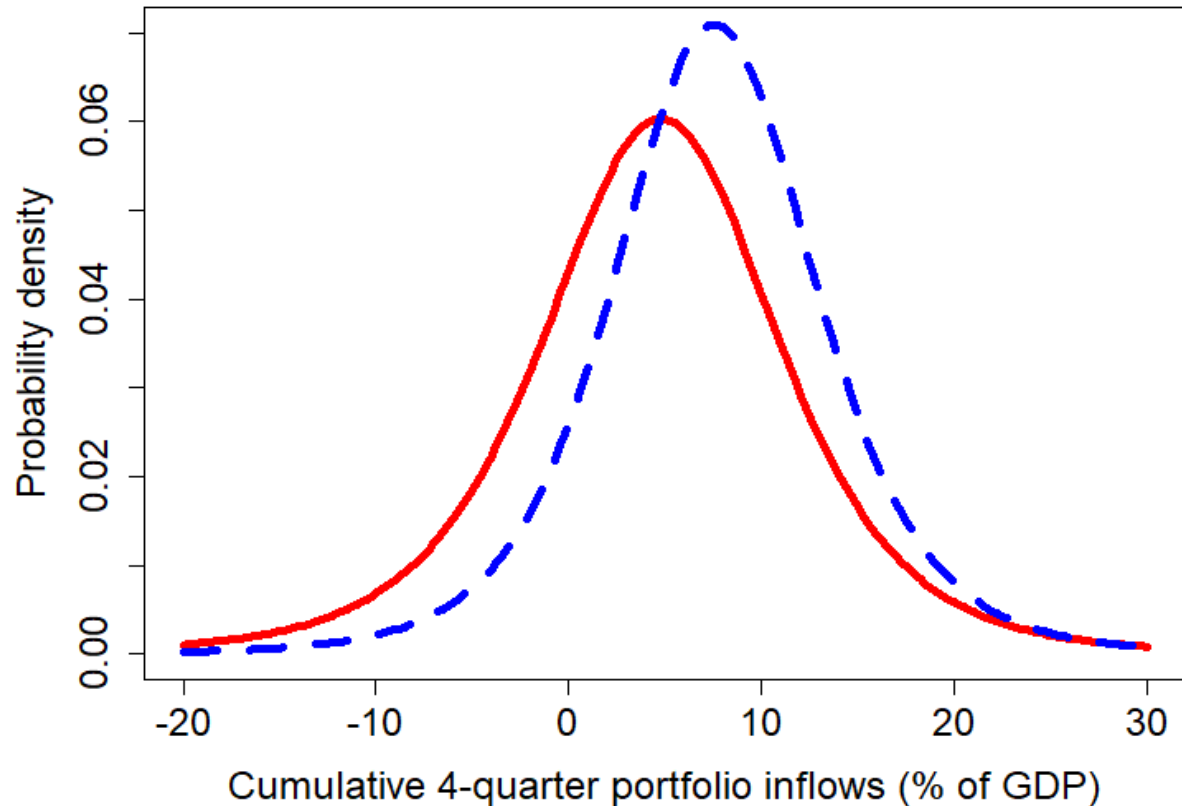
Distribution of portfolio inflows after a global shock:
no intervention vs a two-standard-deviation shock in the sample

- Sales of FX reserves are associated with a smaller likelihood of very large outflows in the short term.

- Monetary and macroprudential policies do not seem to affect the short-term outlook for portfolio inflows after a global shock

- We find strong evidence about the effectiveness of macroprudential policy tools in mitigating the risk of very large outflows in the medium term

- A tightening of CFM in response to an adverse global shock is associated with larger outflows in the short-term (work in progress: need to distinguish between CFMs on inflows and outflows)

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Mitigating Role of Policies: Country Specificities Matter

| Interaction Term with BBB Spread	Short-Term Inflows			Medium-Term Inflows		
	Lower Percentiles	Middle Percentiles	Upper Percentiles	Lower Percentiles	Middle Percentiles	Upper Percentiles
Chile						
Monetary Policy Shock	▓					
Macroprudential Policy Shock						
FXI Shock		▓				
CFM Shock						
Turkey						
Monetary Policy Shock						
Macroprudential Policy Shock	▓			▓		
FXI Shock						
CFM Shock						

Legend: red color corresponds to negative (i.e. exacerbating global shocks) and highly statistically significant impact of a domestic variable, orange color—to a negative but somewhat less statistically significant impact. Green color denotes positive (i.e. mitigating global shocks) and highly statistically significant impact of a domestic variable, light green color—a positive but somewhat less statistically significant impact.

Linking Policy Choices to Country Characteristics

Different policy choices across countries can be linked to some country-specific concerns. For example, FXI responses seem to be related to measures of <u>balance sheet vulnerabilities and depth of FX market.</u> No implication for causality.
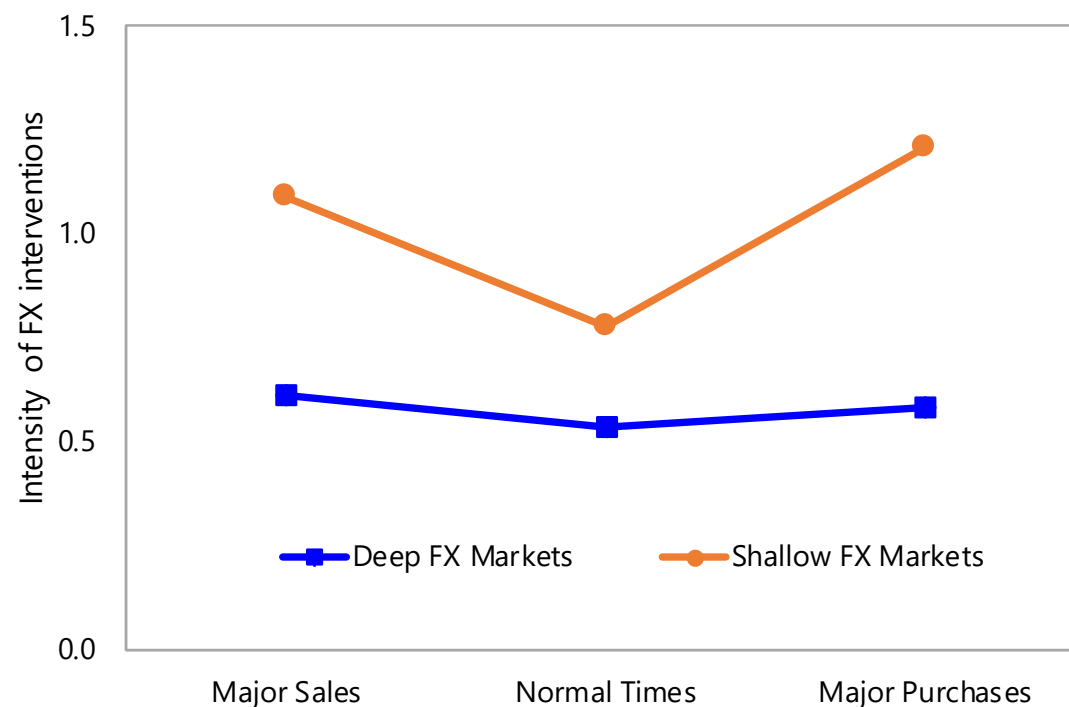
FXI is related to the size of domestic banks' net open positions...
(in percent, response to a one percent of GDP global flow to EMs)
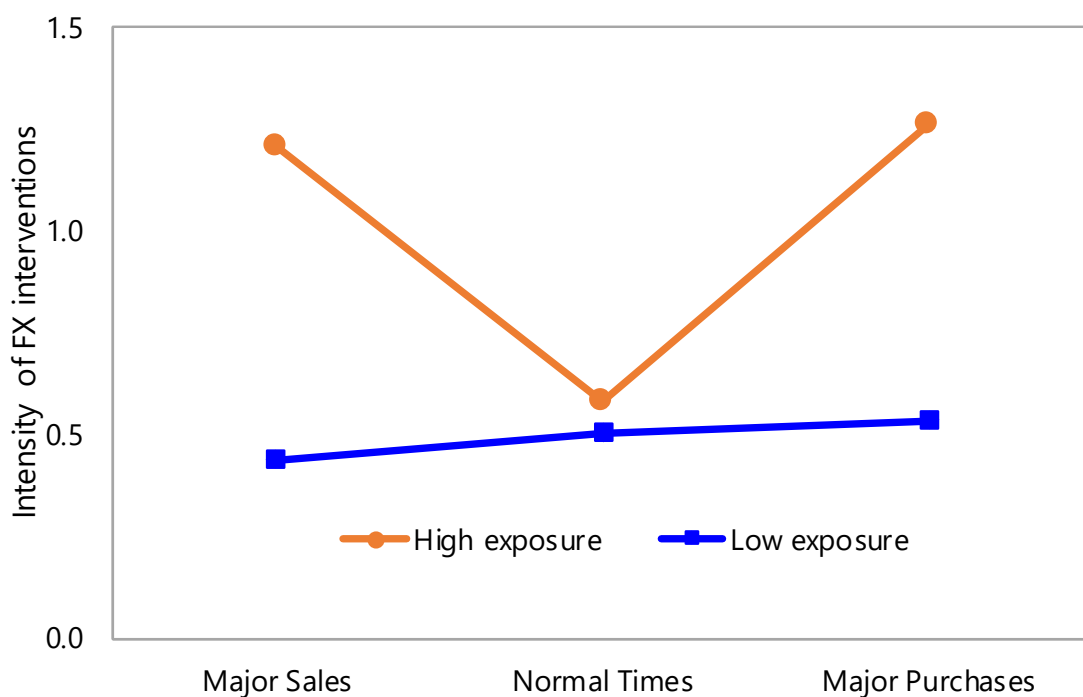
... and to FX market turnover
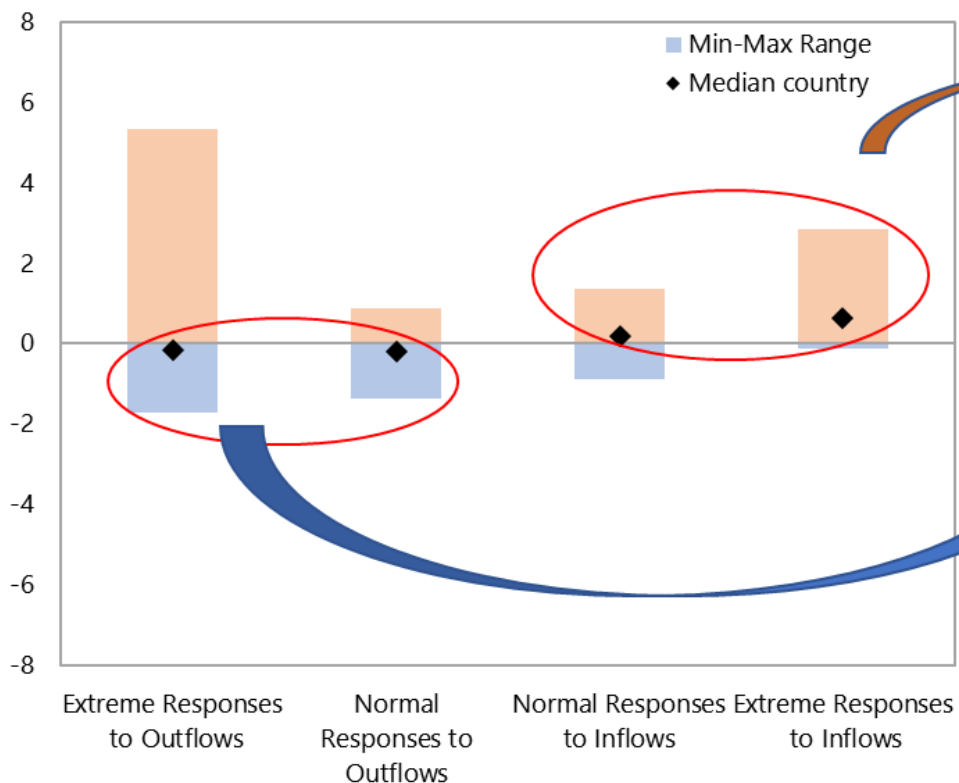(in percent, response to a one percent of GDP global flow to EMs)

Notes: The figures show the average FXI response to the external shock over the next two quarters for two different groups of countries, depending on whether the countries are above or below the median for each of the two characteristics. Averages are taken for different responses, namely at the 10th percentile ("Major Sales"), the 50th percentile ("Normal Times") and the 90th percentile ("Major Purchases").

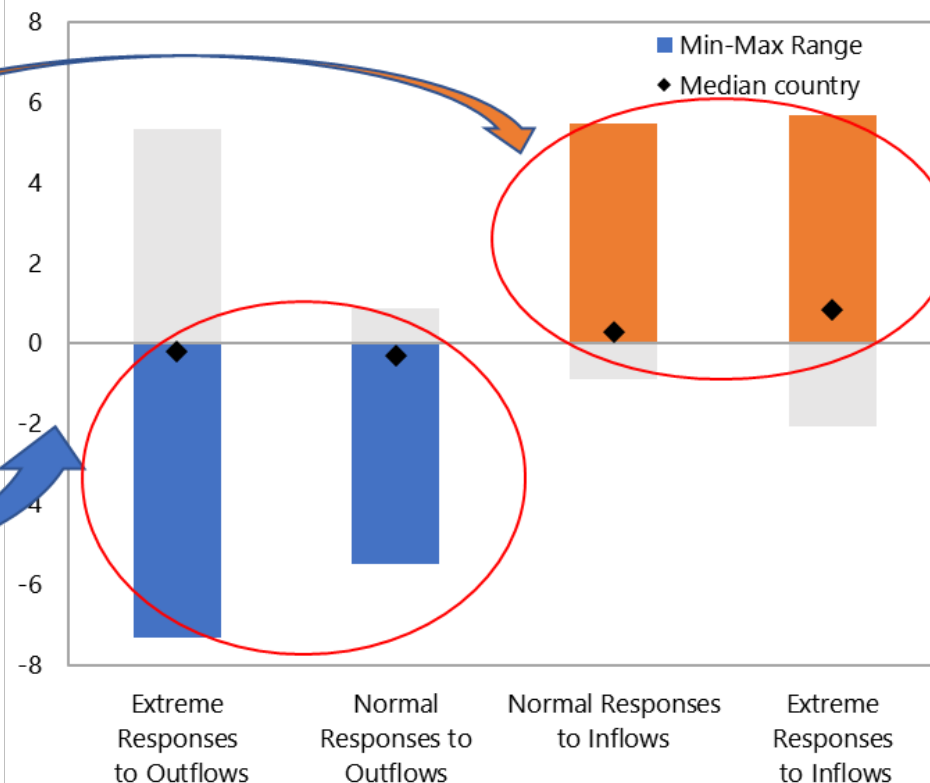Source: Mano and Sgherri   (IMF WP 20/10)

The Role of Complementary Policy Tools

In few instances, the use of policy measures targeting buildup of external balance sheet vulnerabilities in the system <u>may help "free the hands" of monetary policy</u>.

Policy Responses *without* MPMs or CFMs: Interest Rate Hiking
(percentage points, to a one percent of GDP global flow to EMs)

Policy Responses *with* MPMs or CFMs: Interest Rate Hiking
(percentage points, to a one percent of GDP global flow to EMs)

Source: Mano and Sgherri   (IMF WP 20/10)

Conclusions

- Our findings highlight the usefulness of the "at-risk" approach

- Several policy actions or policy frameworks may have considerable impact on the upper or lower tails of the predicted distributions, thus amplifying or mitigating risks to future flows in the presence of adverse global shocks. These effects would have been missed by using a standard approach and focusing on average flows only.

- Promising framework for further research:

  - Drivers of different types of capital flows?

  - Effects of combining different policies? …

- Warning about complexity of policy-making and relevance of country specificities: different countries may choose different policy mixes in the face of the same external shocks.

Thank You!