Capital Flows at Risk: Taming the Ebbs and Flows

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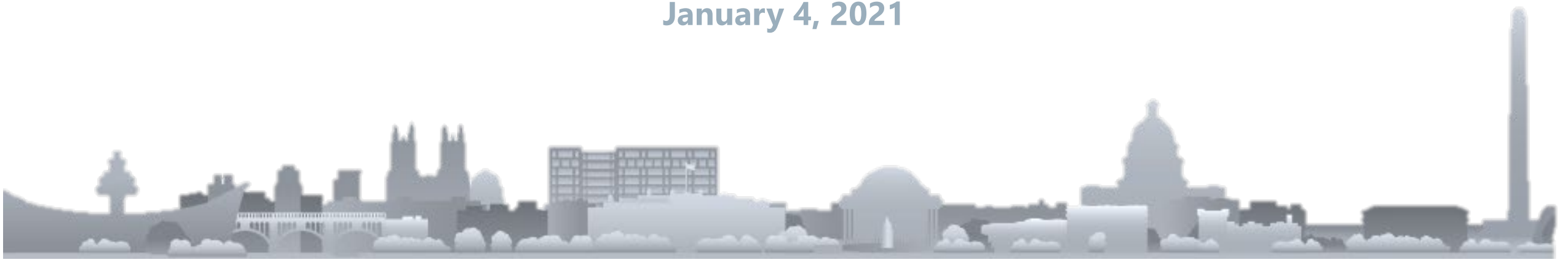

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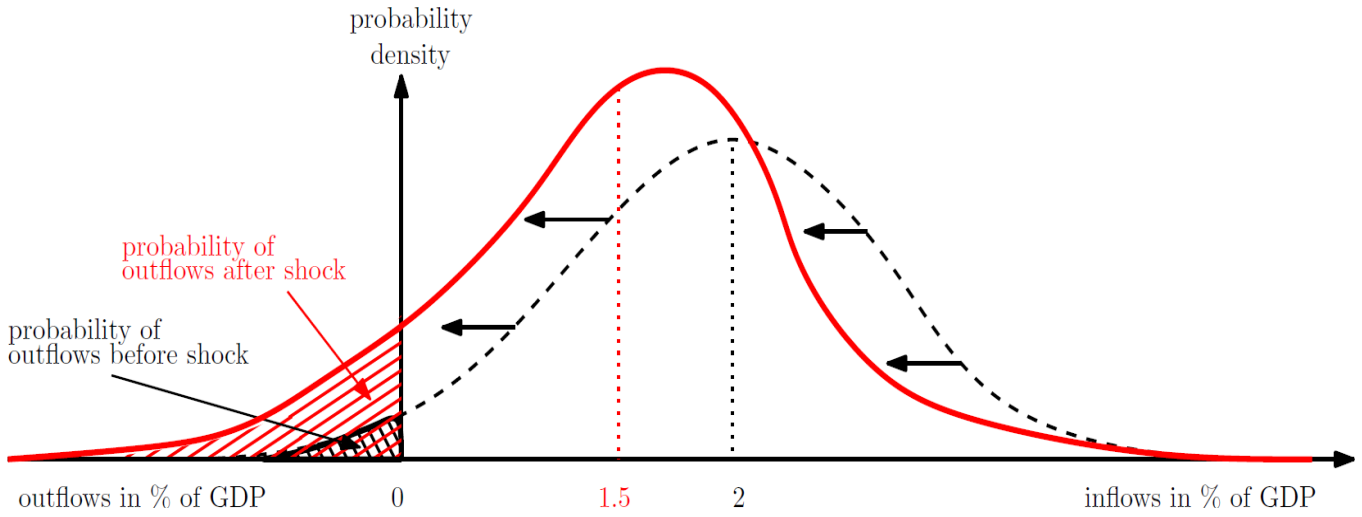
A new approach to the analysis of capital flows

- EM flows are highly volatile, with both inflow surges and sudden stops entailing risks
- Vast literature on drivers and consequences of capital flows
- But typical focus on mean outcomes, or tail episodes within logit-type models…
- Role of policies understudied, despite large and growing theoretical literature
- Aim here: **forecasting entire distributions** of capital flows to EMs **over different time horizons**, and model how these distributions are affected by **global financial conditions, policies and structural characteristics.**
- Build on "at-Risk" framework (Adrian et al. 2019)

Insight

A new approach to the analysis of capital flows

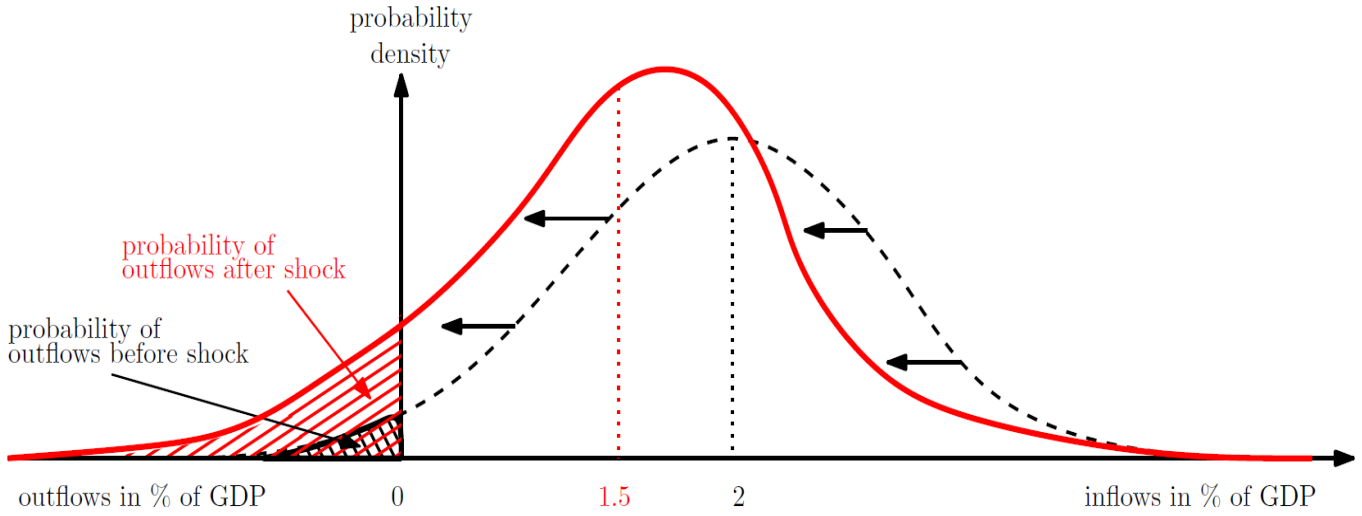
1) Monitoring Capital Flows Risks: Shift in predicted density after a shock



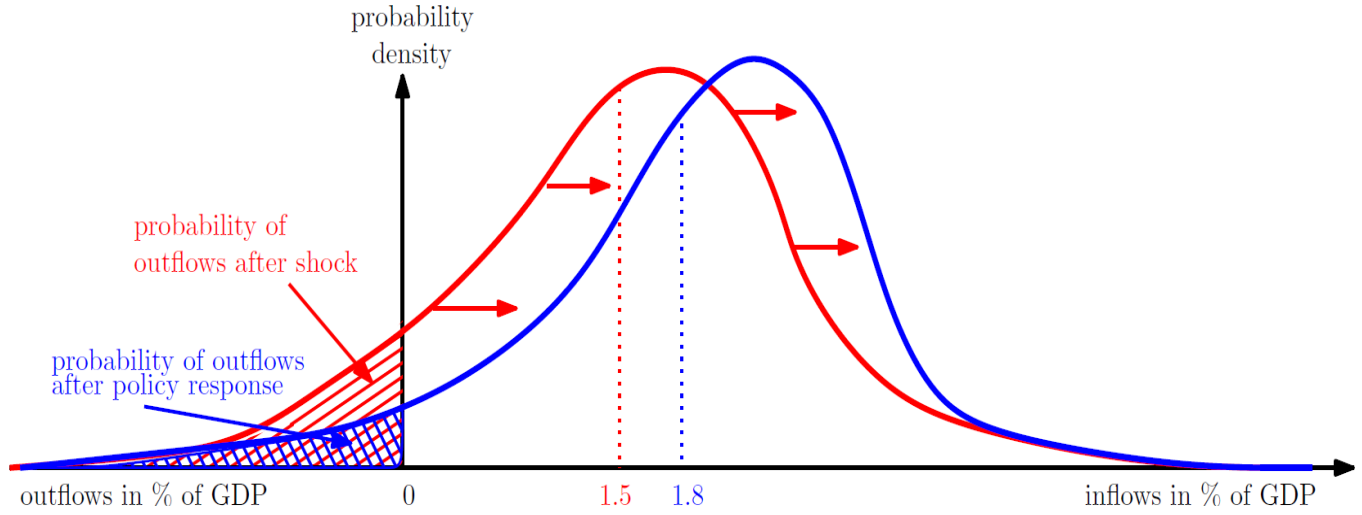
Insight

A new approach to the analysis of capital flows

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



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



Empirical strategy: quantile local projections

- Estimate future portfolio flows using quantile regression framework:

$$(1)\quad \bar{y}^{\alpha}_{i,t:t+h|t} = \delta^{\alpha}_{i,h} + \beta^{\alpha}_{1,h} External_t + \beta^{\alpha}_{2,h} Pol_{i,t} + \boldsymbol{\beta^{\alpha}_{3,h}}\left(\boldsymbol{External_t \times Pol_{i,t}}\right) + \beta^{\alpha}_{4,h} Controls_{i,t-1},$$

  - where $\bar{y}^{\alpha}_{i,t:t+h|t}$ stands for cumulative gross portfolio inflows (in percent of GDP) to country i between quarters t and $t+h$, and $\alpha = 5,10 \ldots 90,95$ stands for the percentile used in the quantile regression.
- Fit empirical distribution to skewed-t probability distribution (Azzalini and Capitani, 2003)

Methodology

Assessing the role of policies, policy frameworks, and structural characteristics

To keep model parsimonious, focus on changes in U.S. corporate BBB yields, and add each policy/policy framework/structural characteristic one at a time:

(2) $\bar{y}^{\alpha}_{i,t:t+h|t} = \delta^{\alpha}_{i,h} + \beta^{\alpha}_{1,h} US\ BBB_t + \beta^{\alpha}_{2,h} Pol_{i,t} + \boldsymbol{\beta^{\alpha}_{3,h}}\left(\boldsymbol{US\ BBB_t} \times \boldsymbol{Pol_{i,t}}\right) + \beta^{\alpha}_{4,h} Controls_{i,t-1}$,

$\boldsymbol{\beta^{\alpha}_{3,h}} > \mathbf{0}$: policy $Pol_{i,t}$ reduces impact of a higher BBB yield on the α percentile of future portfolio inflows at horizon h.

- Use portfolio flows by nonresidents (from IMF FFA database)
- Controls: domestic real GDP growth, U.S. real GDP growth, ST FX debt to FX reserves, financial integration with global markets
- Sample: 18 EMs for which we can control for financial integration with global markets (Bekaert et al. 2011), quarterly data 1996-2018
- Robustness: 37 EMs and lower-middle income countries; VIX instead of BBB yield

Constructing policy variables

Examine monetary-, macroprudential-, and capital flow management measures, and FX interventions.

- Policy actions often deployed by EMs in response to- (or in order to prevent) large movements of capital flows
- CFM and macroprudential policies: binary action indicators (Alam et al. 2019, AREAER)
- To address endogeneity, use residuals from estimated policy functions (see Brandao-Marques et al., 2020, and Forbes and Klein, 2015).

Constructing policy variables

- Use residuals from estimated policy functions
- Example: macropru policy: panel ordered probit regression with country fixed effects.
  - Index of macropru measures with values {-2,-1,0,1,2} if, in net terms, there were >1 loosening measures, 1 loosening measure, no change, 1 tightening measure, or >2 tightening measures (Alam et al., 2019).
  - Explanatory variables: 2 lags of U.S. corporate BBB yield, detrended U.S. 10-year yield, VIX index, gross portfolio inflows (in % of GDP), real GDP growth, lag of credit to GDP gap (dev. from trend), 2 lags of dependent variable.

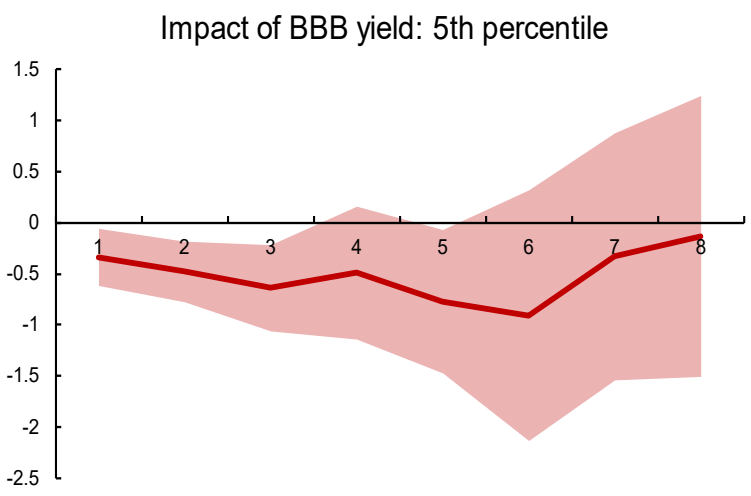
$$\hat{\varepsilon}_{it}^{MPM} = MPM_{it} - \sum_{k=-2}^{2} \hat{p}_k k$$

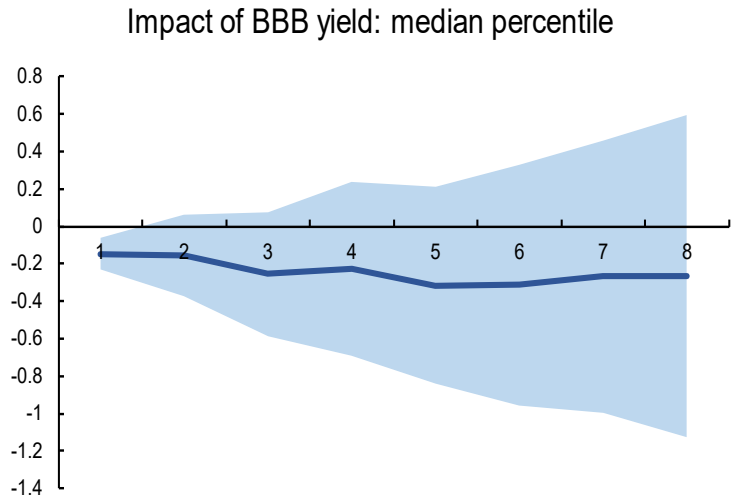
where MPM_{it} is the dependent variable, and $\hat{p}_k$ is the probability of $MPM_{it} = k$, with k in {-2,-1,0,1,2}, estimated through the probit regression.

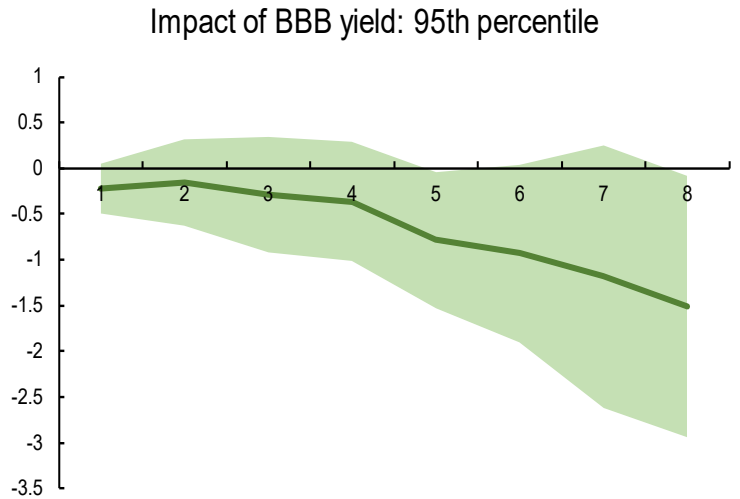
Also consider structural characteristics: ER flexibility, Financial Development, Rule of Law, Capital Account Openness, Central Bank Transparency.

Results

A tightening in global financial conditions is followed by a larger risk of capital outflows





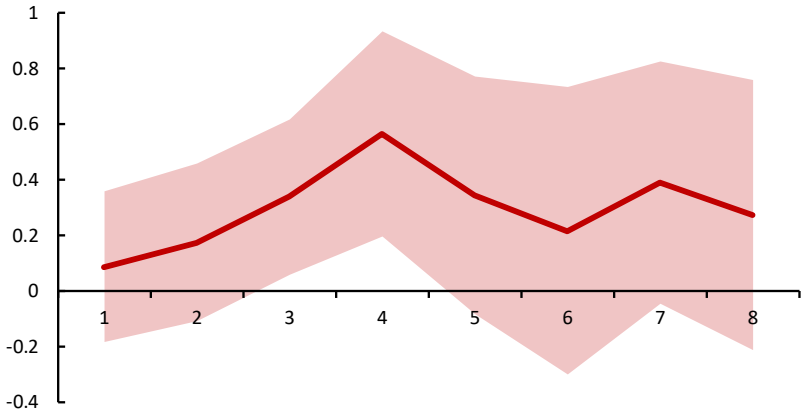


Note: shows coefficient on U.S. corporate BBB yield for different horizons

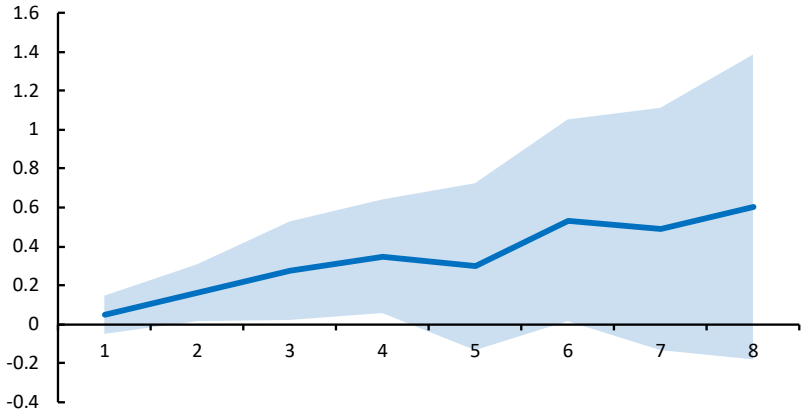
Results

FX sales and (to a lesser extent) monetary tightening mitigate *downside risks to portfolio flows* from adverse global shocks

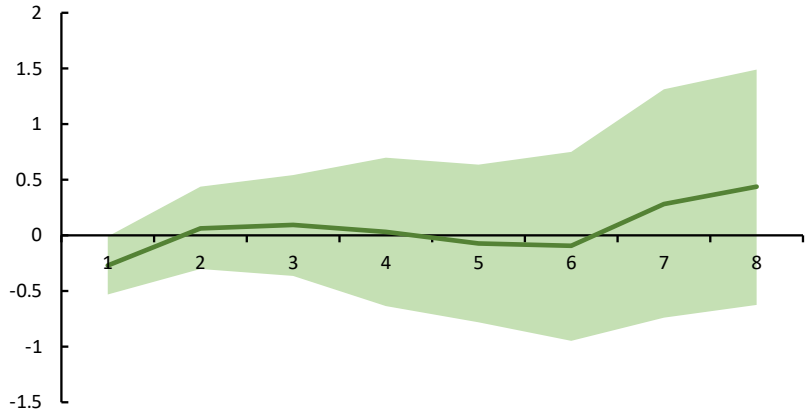
FX sale: 5th percentile



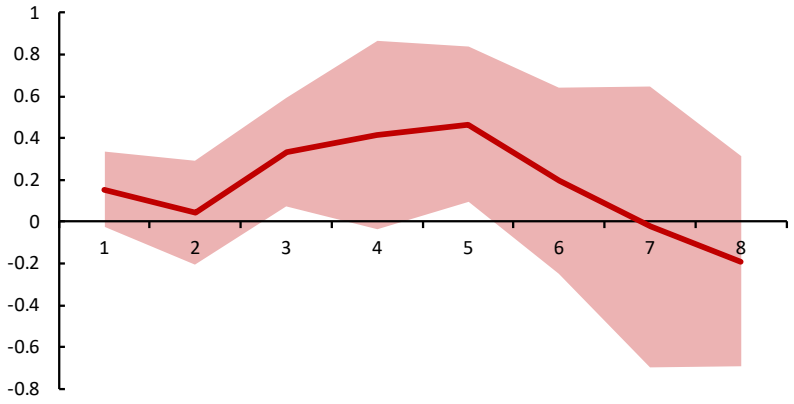
FX sale: 50th percentile



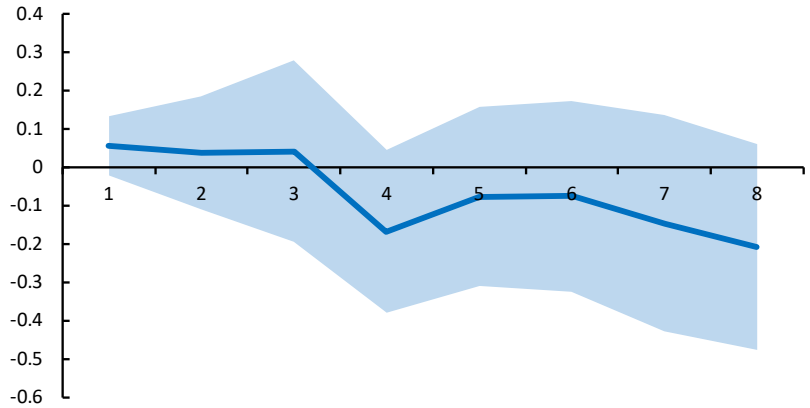
FX sale: 95th percentile



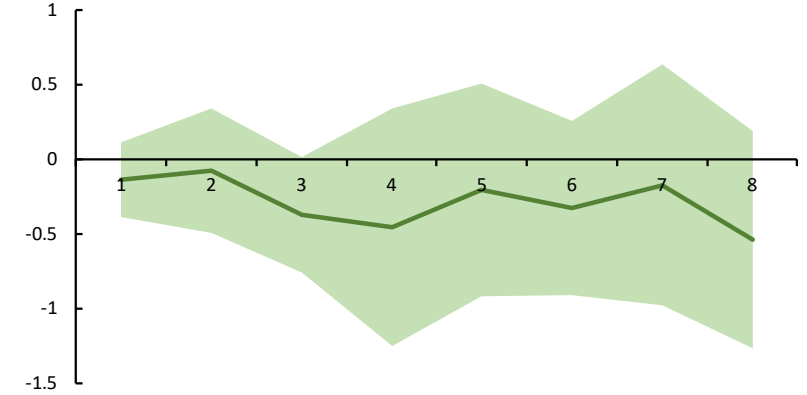
Monetary tightening: 5th percentile



Monetary tightening: 50th percentile

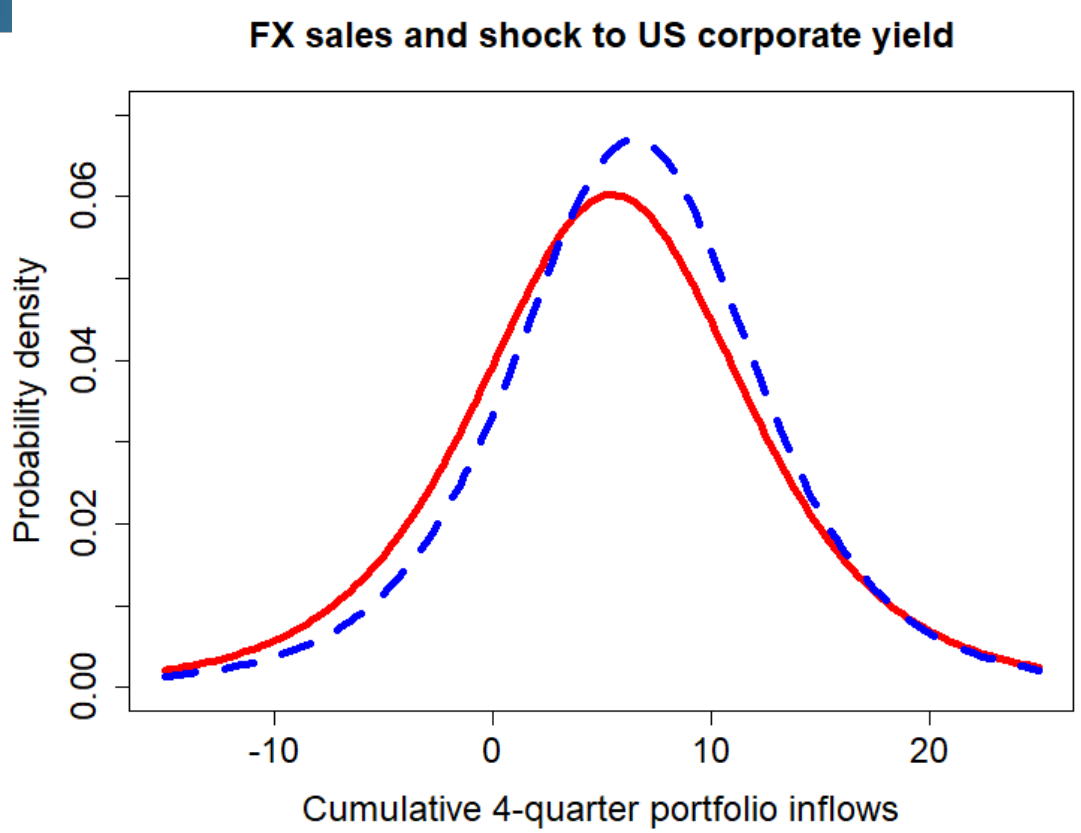


Monetary tightening: 95th percentile

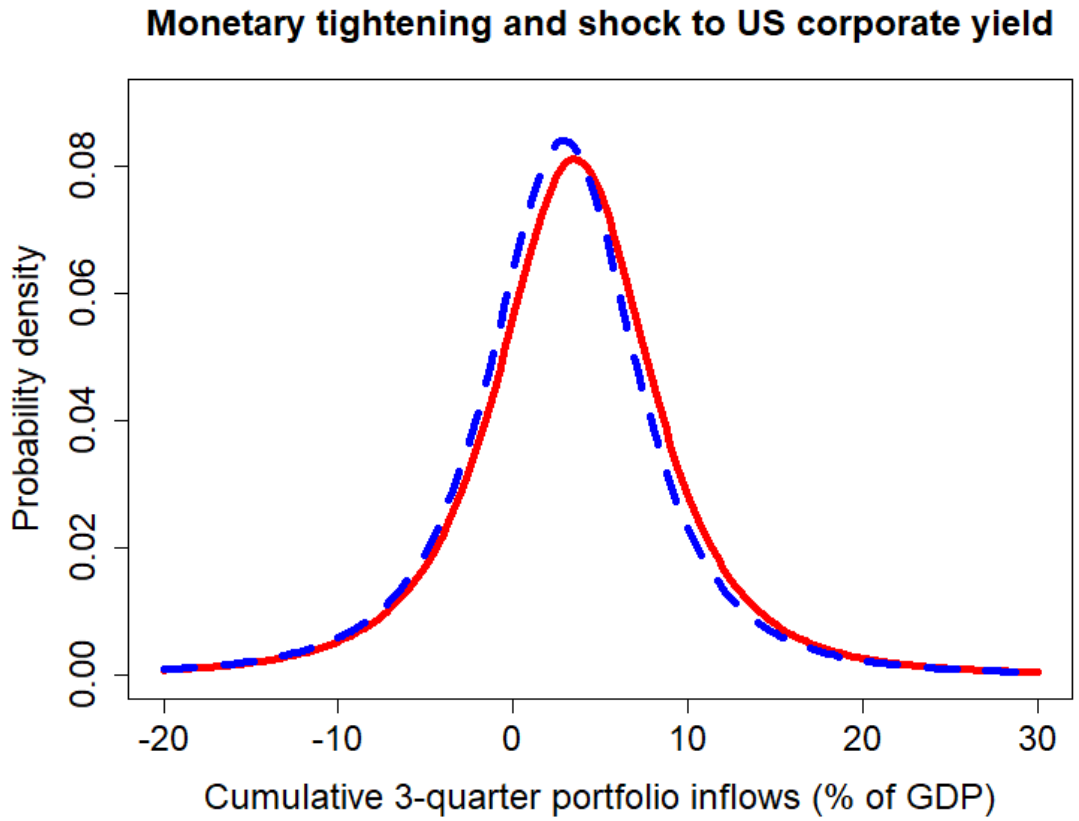


Note: shows coefficients on interaction term between FX and the U.S. corporate BBB yield

Effect of FX sales is quantitatively important



Distribution of cumulative portfolio inflows
after a global shock:
No FX intervention vs FX sale of 1.5% of GDP



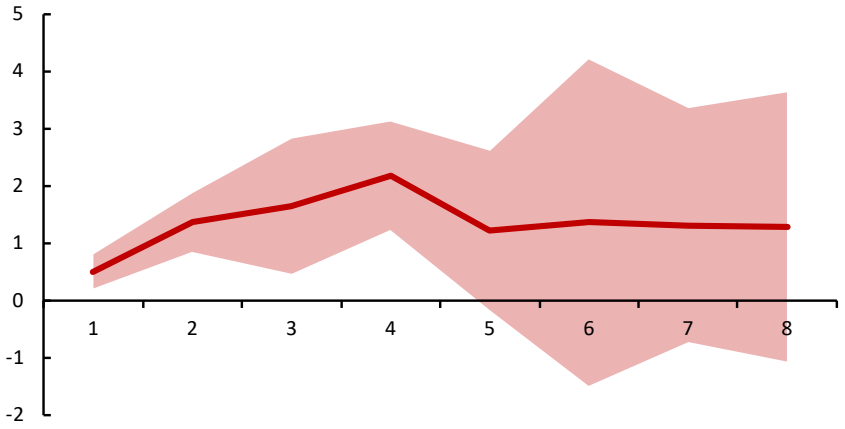
Distribution of cumulative portfolio inflows
after a global shock:
No monetary action vs tightening of 200 bp

=>reduction in P(net outflows) from 22 to 16 percent in the face of a 160bp (1 std deviation) rise in BBB yields

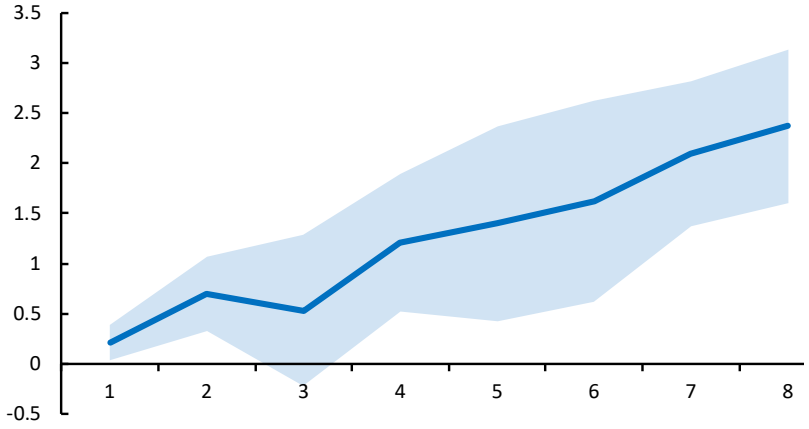
Results

Macroprudential easing mitigates *downside risks and amplifies upside risks* following adverse global shocks

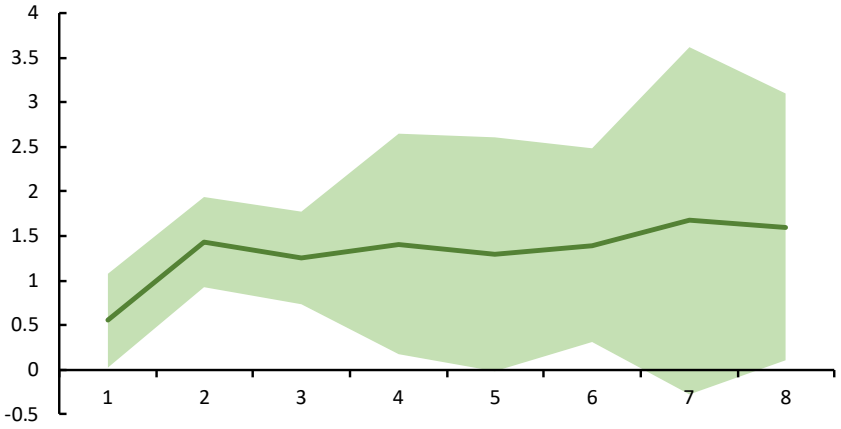
MaPP easing: 5th percentile



MaPP easing: 50th percentile



MaPP easing: 95th percentile

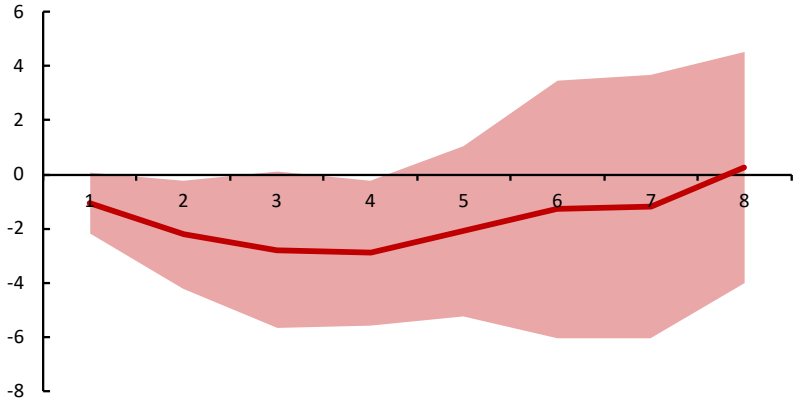


Note: shows coefficients on interaction term between macropru and the U.S. corporate BBB yield.
Horizontal axis: horizon of cumulative gross portfolio flows (quarters).

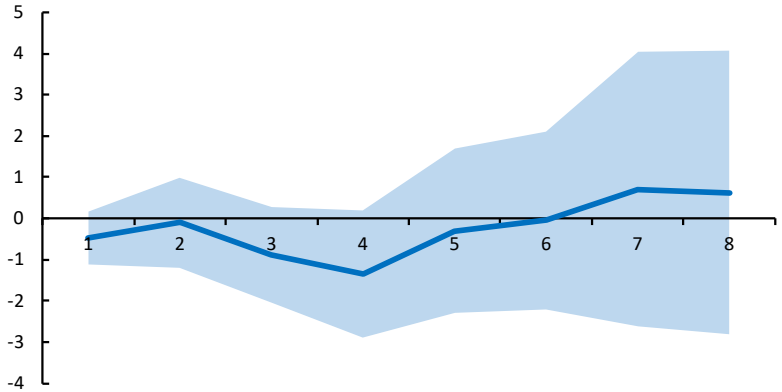
Results

CFM tightening *amplifies downside risks* after an adverse global shock

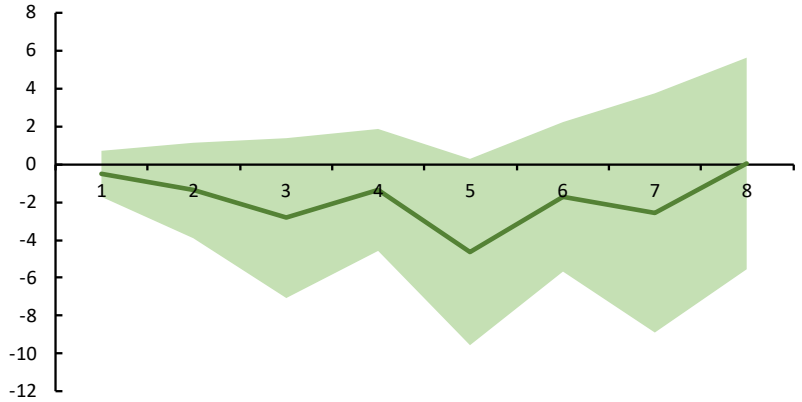
Inflow CFM tightening: 5th percentile



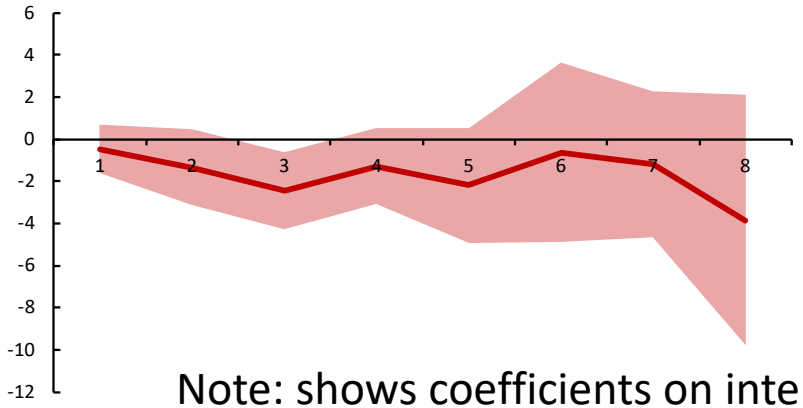
Inflow CFM tightening: 50th percentile



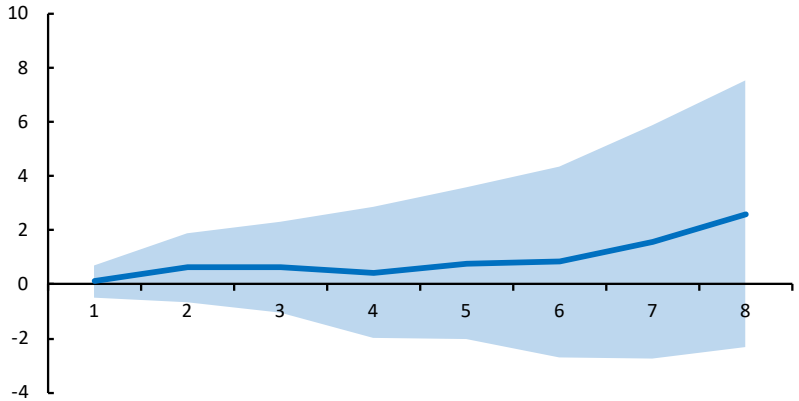
Inflow CFM tightening: 95th percentile



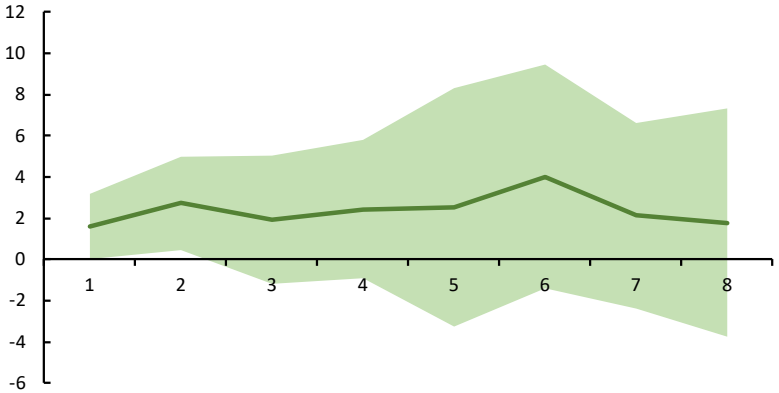
Outflow CFM tightening: 5th percentile



Outflow CFM tightening: 50th percentile



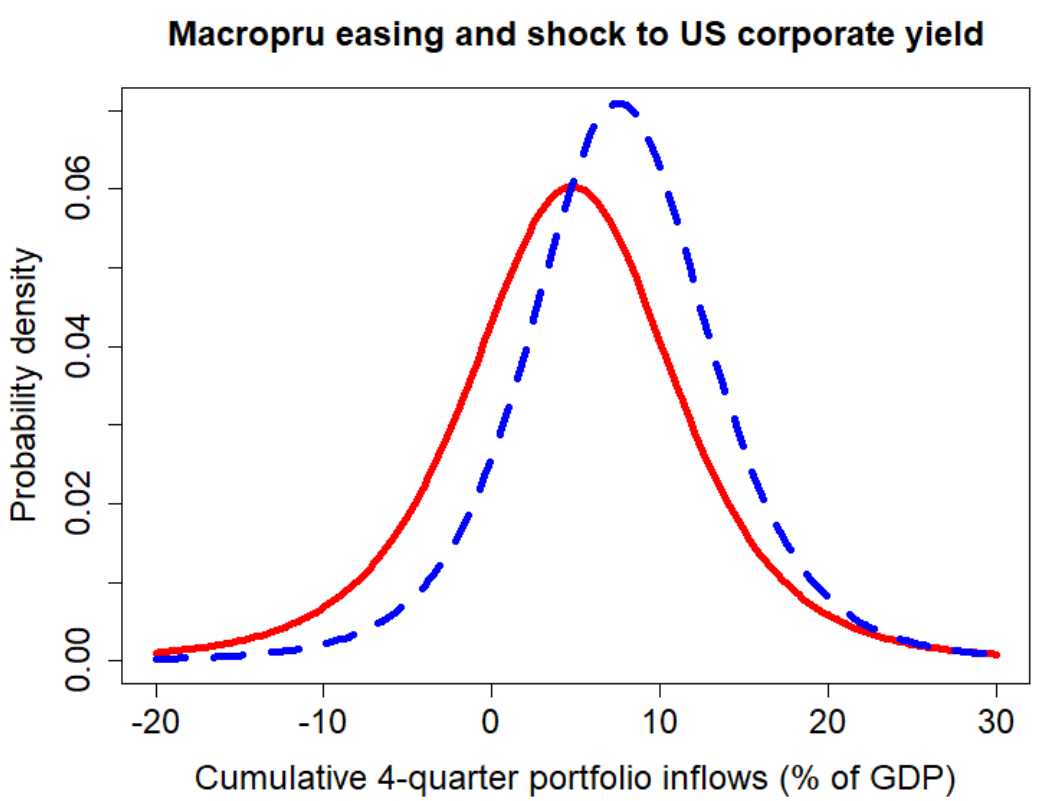
Outflow CFM tightening: 95th percentile



Note: shows coefficients on interaction term between CFM and the U.S. corporate BBB yield
Horizontal axis: horizon of cumulative gross portfolio flows (quarters).

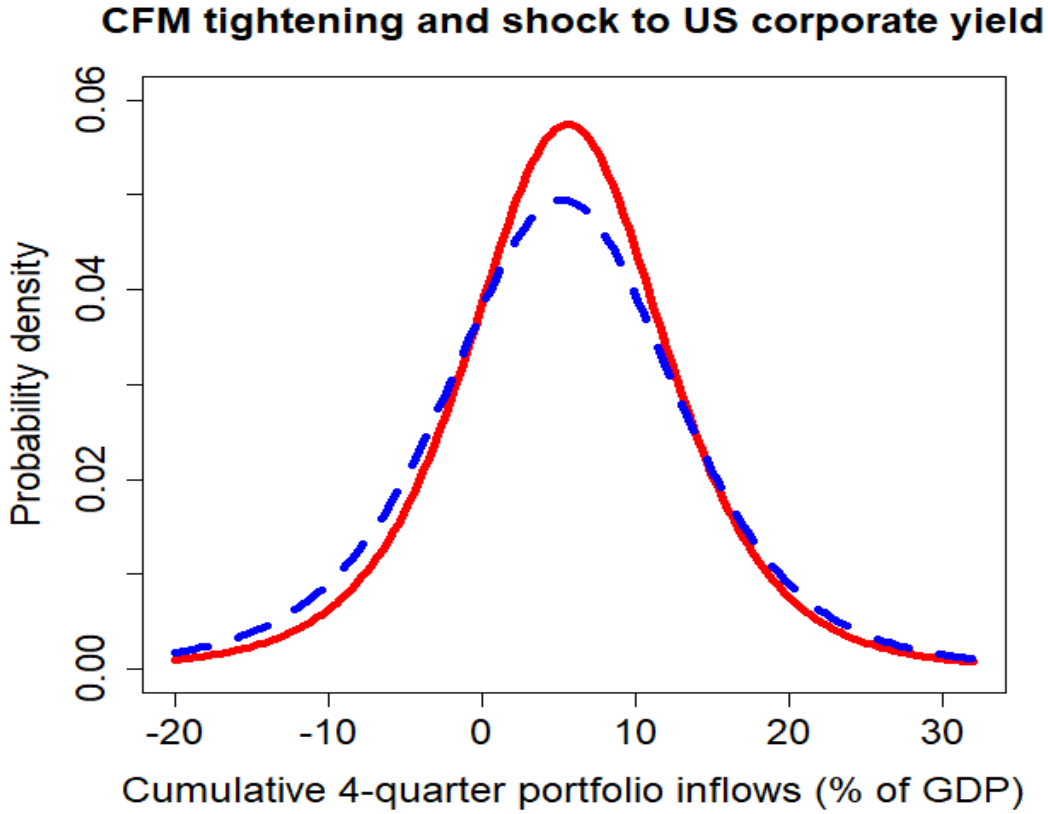
Results

Effect of macroprudential policy loosening is quantitatively important



Distribution of cumulative portfolio inflows after a global shock:
No MaPP intervention vs MaPP easing

=>reduction in P(net outflows) from 24 to 11 percent

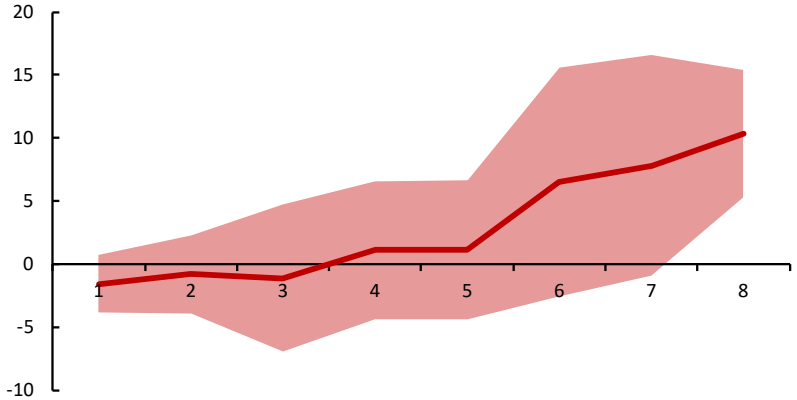


Distribution of cumulative portfolio inflows after a global shock:
No CFM intervention vs CFM tightening

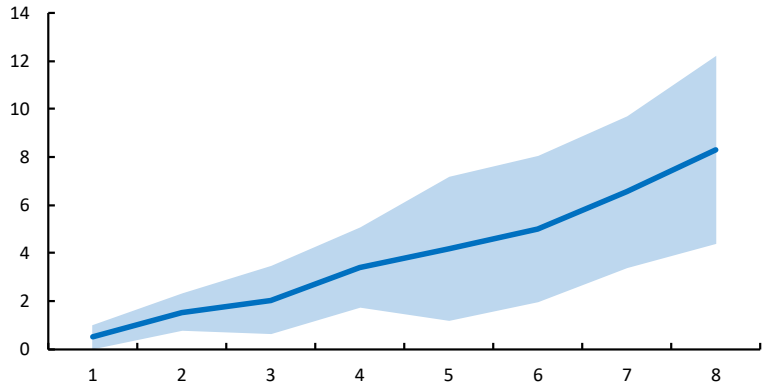
Results

Greater financial development is associated with stronger rebound of flows. Greater ER flexibility involves intertemporal trade-off.

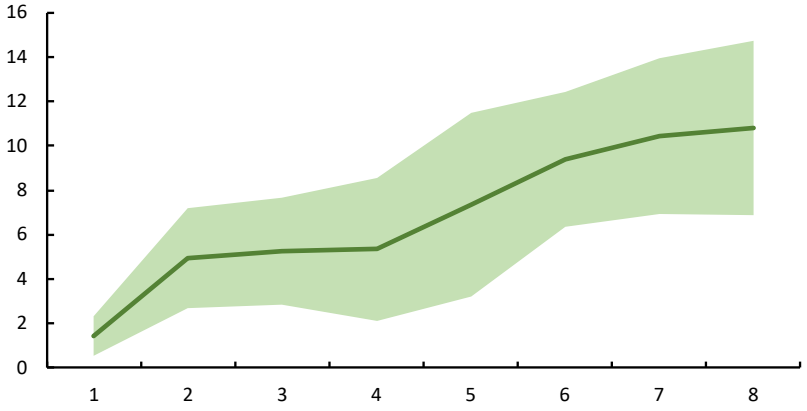
Financial Development: 5th percentile



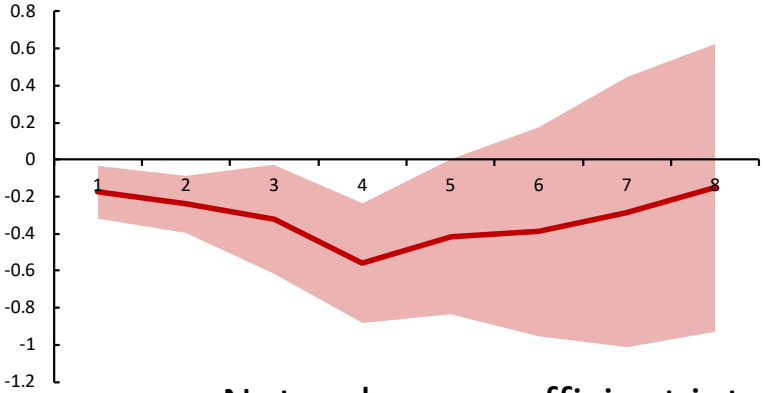
Financial Development: 50th percentile



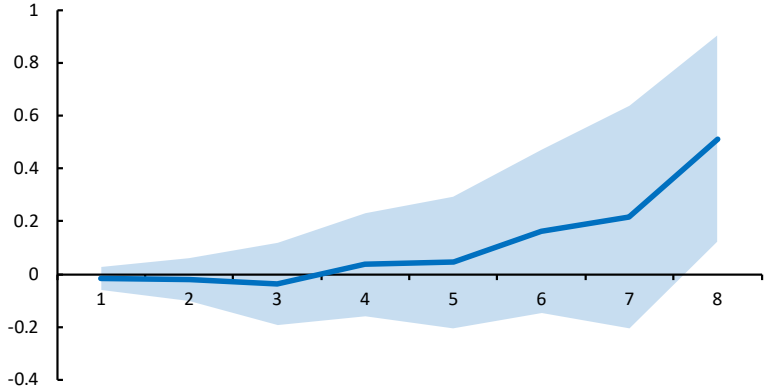
Financial Development: 95th percentile



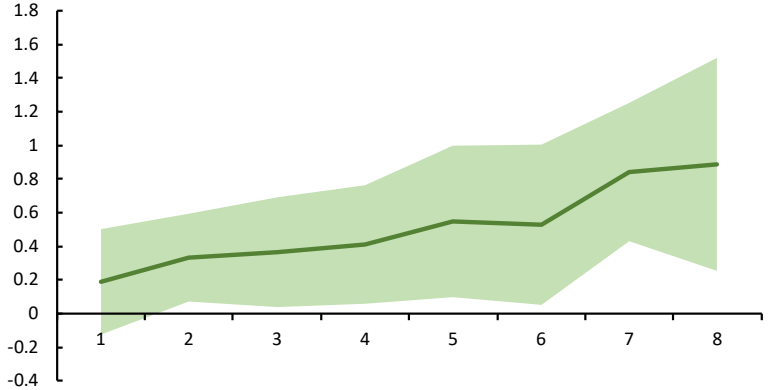
ER Regime: 5th percentile



ER Regime: 50th percentile



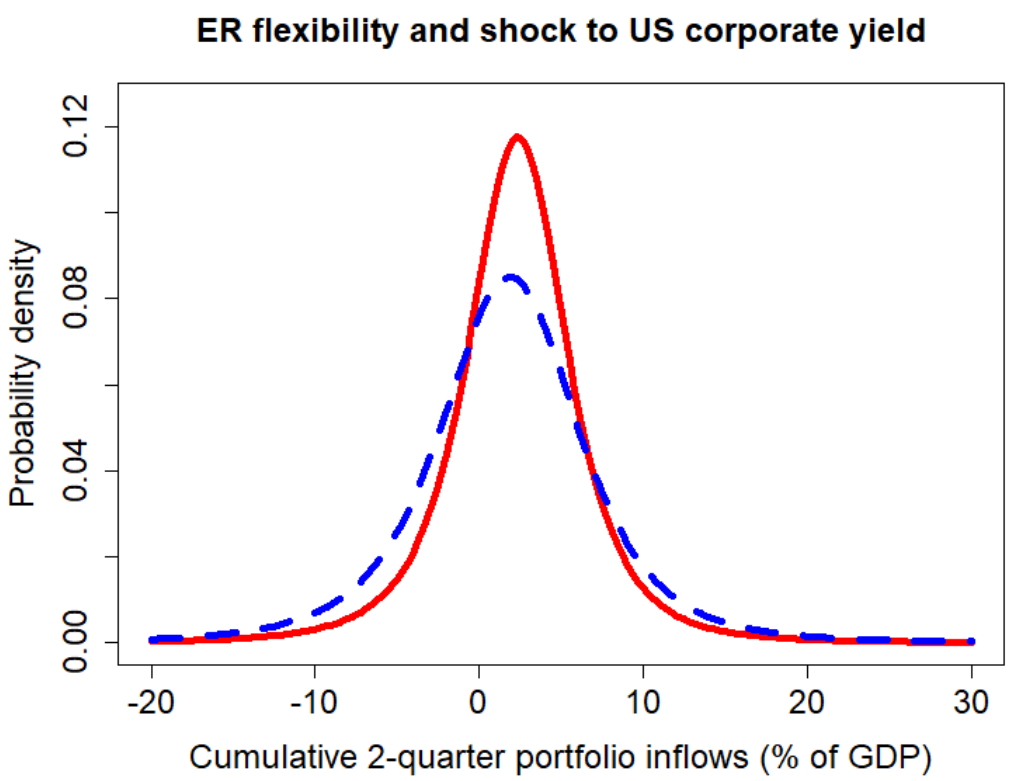
ER Regime: 95th percentile

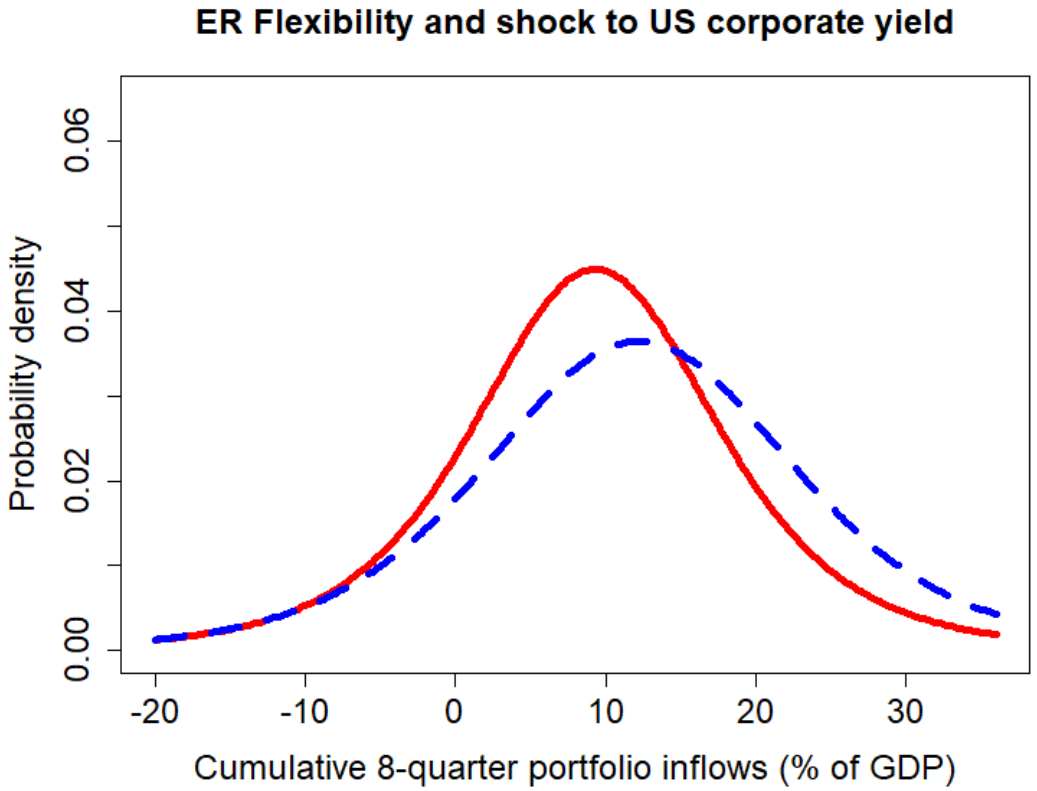


Note: shows coefficient interaction between financial development or ER regime and U.S.
Higher values for ER regime denote more flexible regimes.

Results

Greater ER flexibility is associated with larger near-term volatility of flows after an adverse shock, but with higher median flows in the medium term.

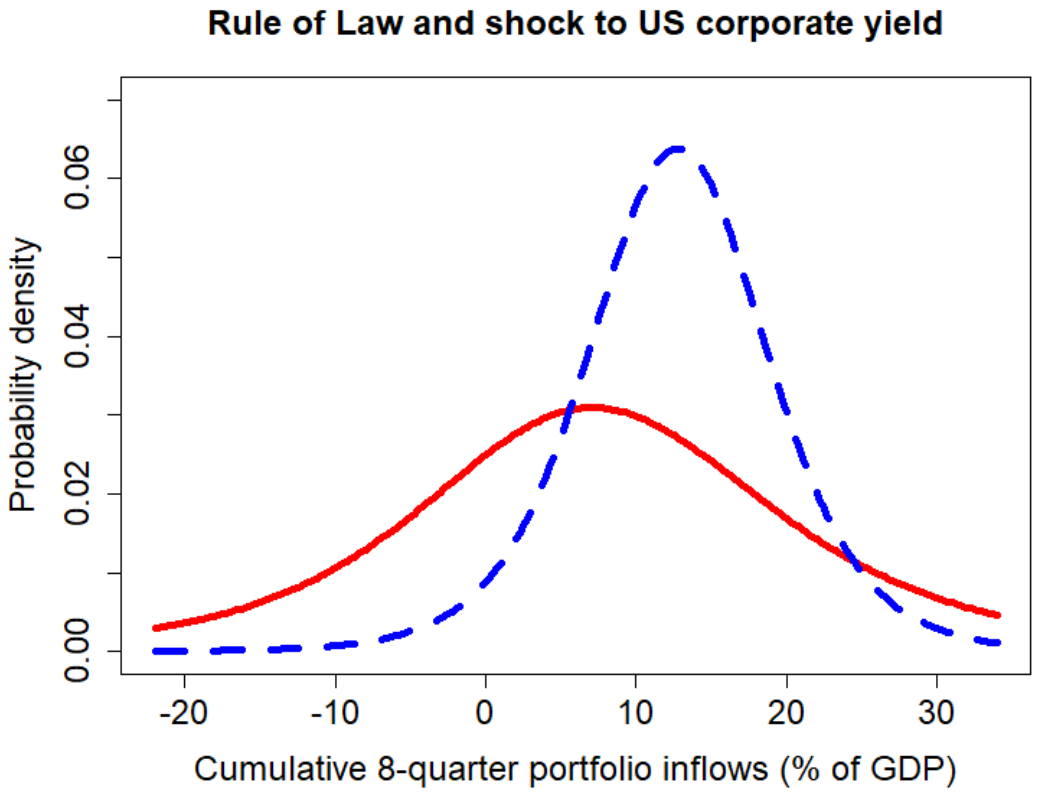




Distribution of cumulative 2-quarter and 8-quarter portfolio inflows after a global shock:
exchange rate is more rigid vs exchange rate is more flexible

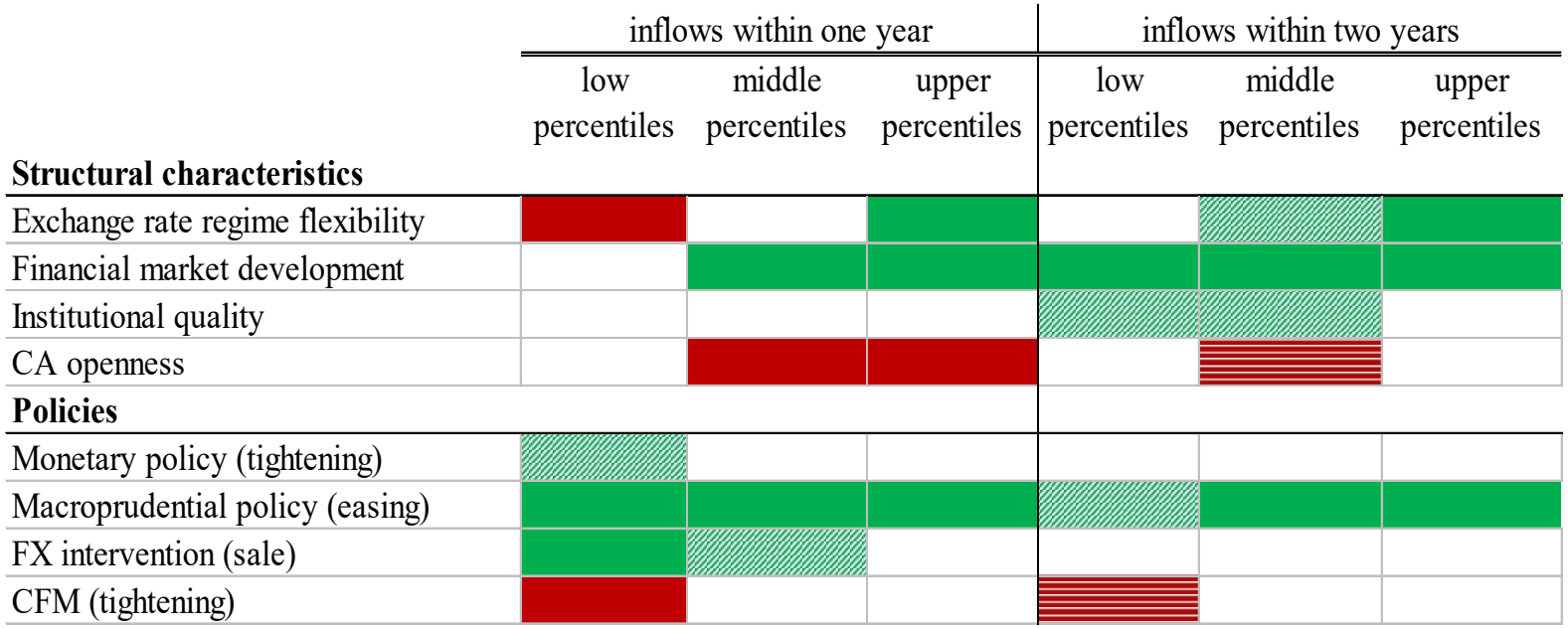
Results

Better domestic institutions are associated with higher median flows and lower tail risks in the medium term



Distribution of medium-term portfolio inflows after a global shock when:
institutional quality is low vs institutional quality is high

Summary of results: Looking at temporal patterns and tails of the flows distribution matters for policy assessment



- More flexible ER amplifies post-shock volatility of capital flows, but supports medium-term rebound
- More developed financial markets and better institutions associated with higher medium-term flows
- FXI, and, to a lesser extent, monetary policy tightening mitigate downside risks to capital flows following adverse global shocks, while macropru policies affect entire distribution of flows.
- Tightening of CFMs might be counterproductive
- Results are symmetric – i.e. converse applies to scenario of global financial loosening (imposed by estimation restriction)

Overview of potential empirical applications of the "at-Risk" framework

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 analysis**	**Bilateral surveillance**
Outlook, (tail) risk monitoring, role of external drivers	Role of external, domestic drivers and policy actions	Outlook, drivers, (tail) risk monitoring, scenario analysis

Conclusions

- Findings highlight usefulness of approach.
- Several policies/policy frameworks appear to affect upper or lower tails of distributions, thus amplifying/mitigating risks to future flows after global shocks. Effects would have been missed with standard methods.
- Promising framework for further research:
  - Asymmetries?
  - Effects of combining different policies? …
- Highlights 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!