

Capital Flows at Risk

Ratna Sahay, Gaston Gelos, Lucyna Gornicka,
Robin Koepke, and Silvia Sgherri

Key Questions

- How do global factors influence the likelihood and severity of future reversals and surges of capital flows to the EMs?
- How do domestic policy frameworks and structural characteristics affect these outcomes in the short term and in the medium term?
- What is the impact of structural characteristics over different horizons?

We build on existing literature

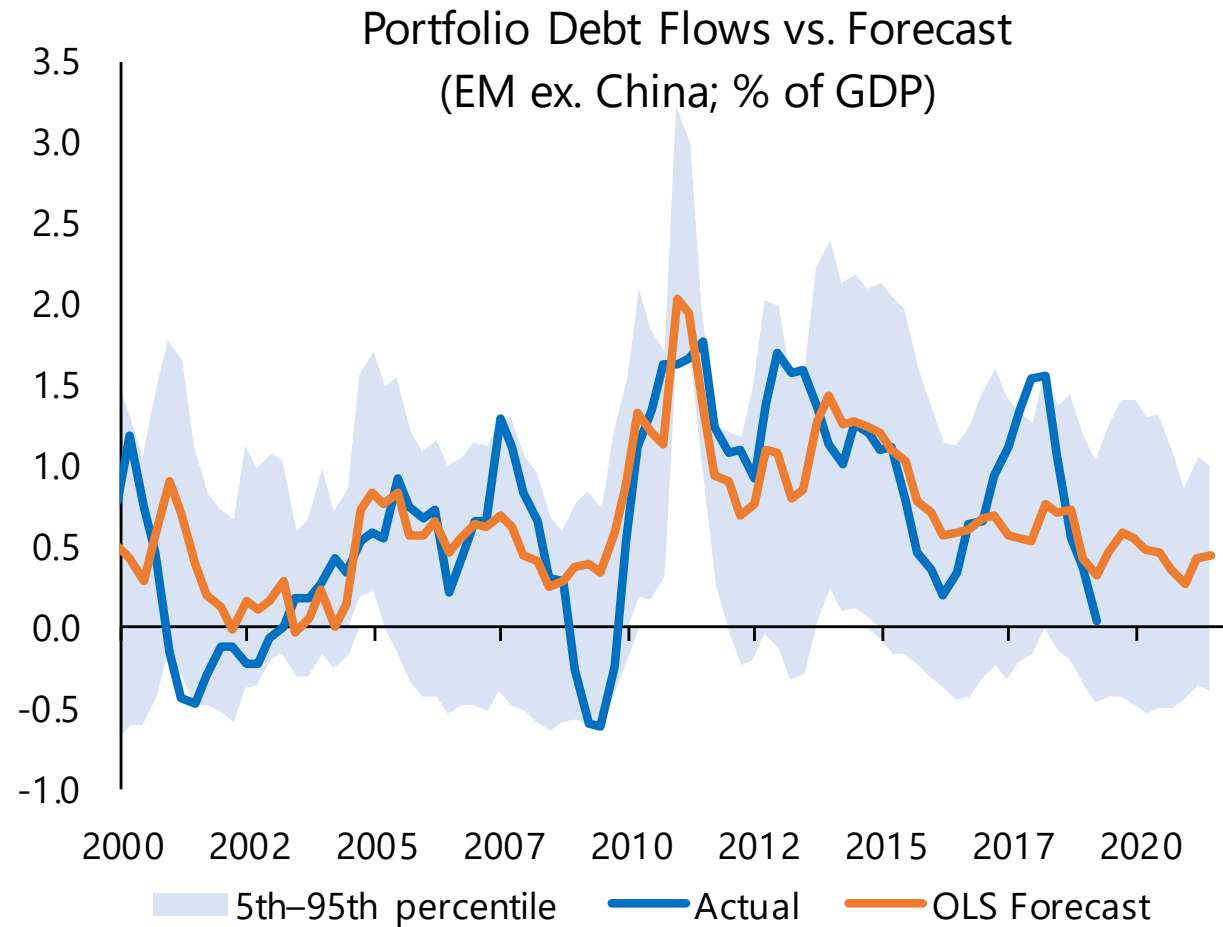
We follow the existing literature when looking at determinants of capital flows:

- **Extreme capital flow movements:** Reinhart and Reinhart (2009), Cardarelli et al. (2010), Forbes and Warnock (2012), Ghosh et al. (2014), Calderon and Kubota (2019)
- **Global "push" factors:** Forbes and Warnock (2012), Ghosh et al. (2014)
- **Domestic "pull" factors:** Cardarelli et al. (2010)
- **Regional factors:** Mercado and Park (2011), Calderon and Kubota (2019)
- **Factors explaining different types of capital flows:** Koepke (2018)

We differ from the literature in the analytical approach, which builds on the "at-Risk" approach by Adrian et al. (2018):

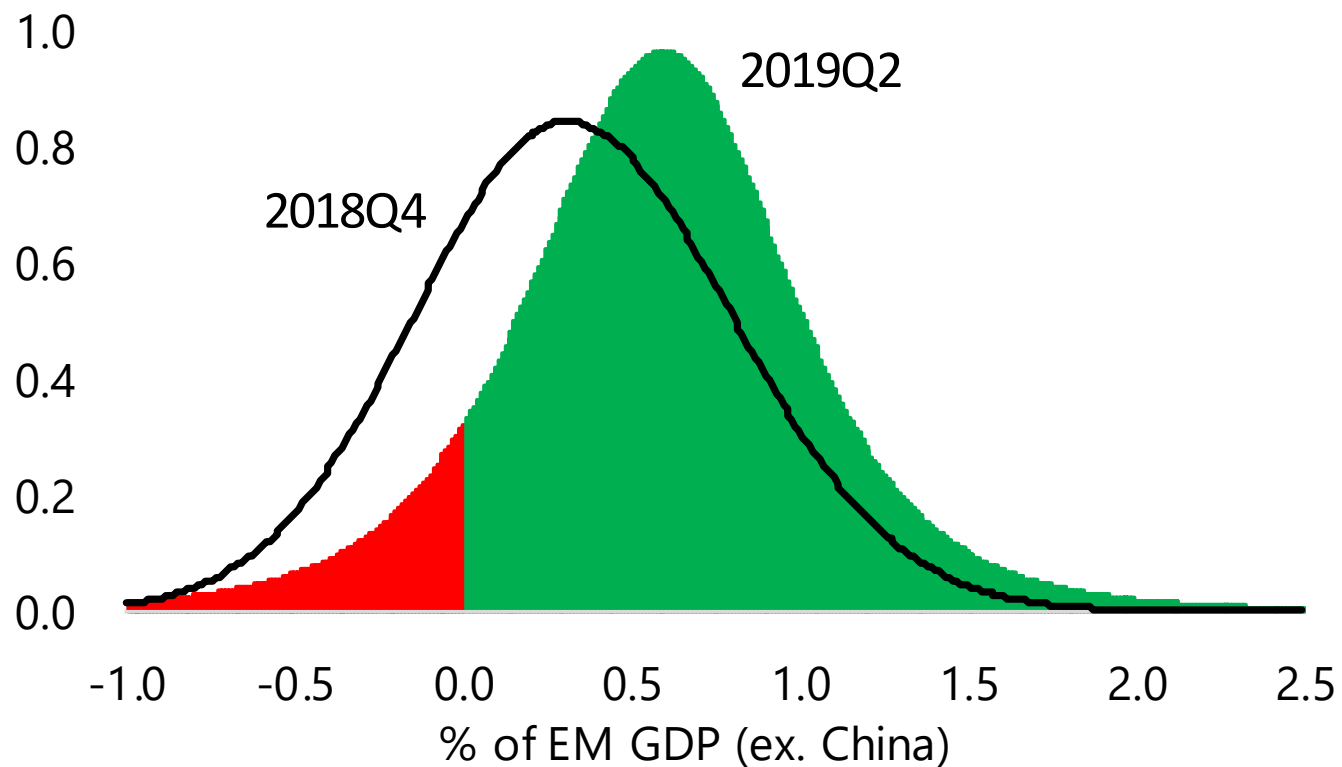
- study the **whole distribution of capital flows** at once
- a structured way of **quantifying risks to capital flows**

Simple OLS model prediction fails to capture periods of large inflows and outflows.



Instead, we predict the entire future probability distribution of capital flows.

Conditional Densities for Portfolio Debt Flows in the Medium Term



To construct distributions of future capital flows we run quantile regressions...

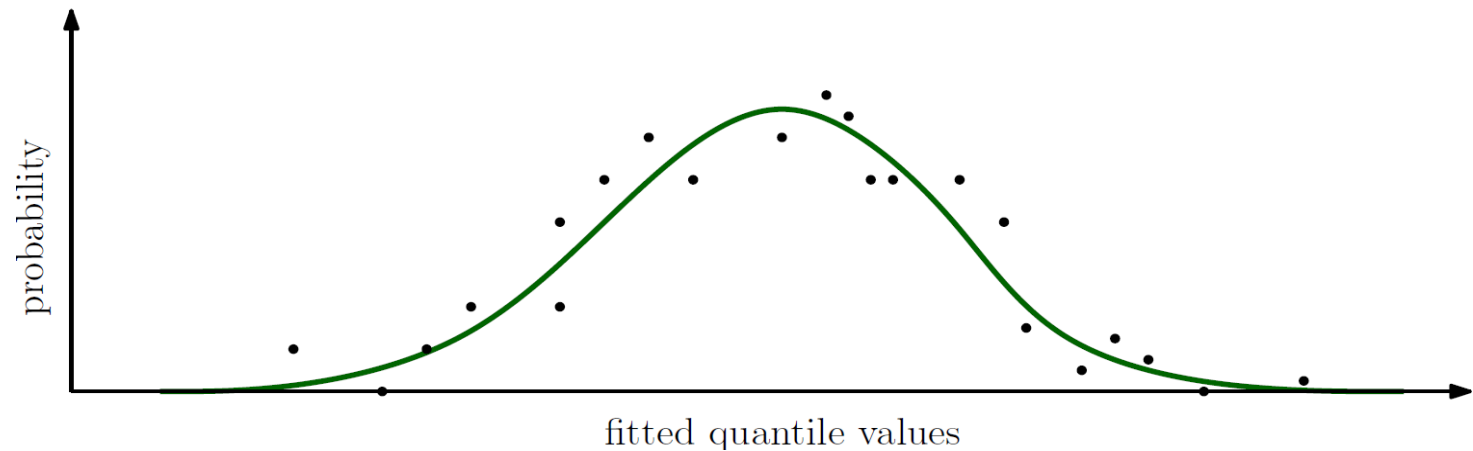
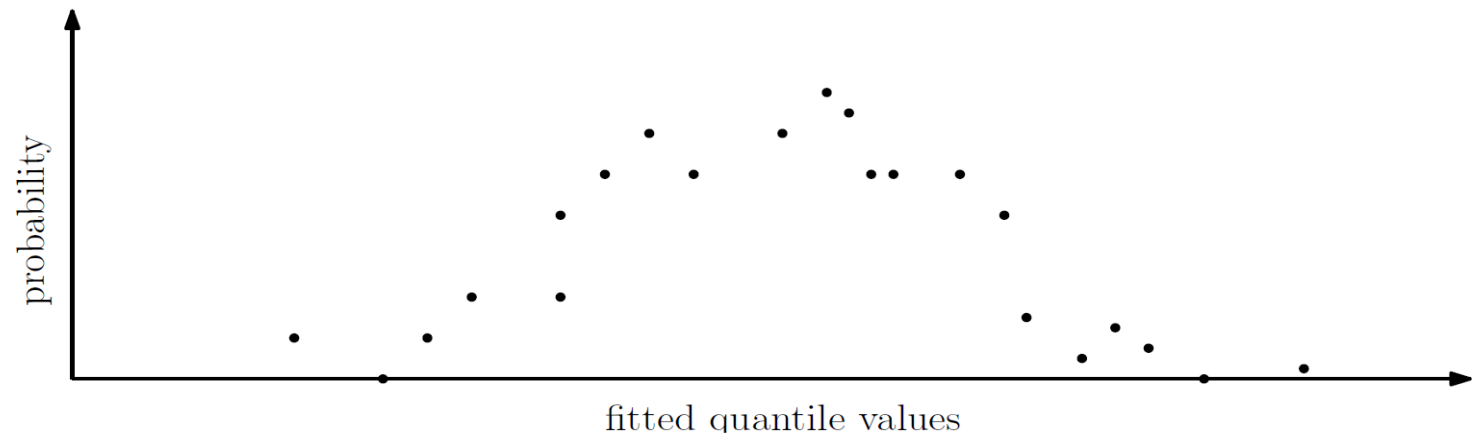
Step 1. Run quantile regressions with country panel, based on Growth-at-Risk methodology:

$$\left(\frac{\text{Flows}}{\text{GDP}}\right)_{i,t+h|h}^q = \alpha_i^q + \beta_1^q \text{Global}_t + \beta_2^q \text{Domestic}_{i,t} + \beta_3^q \text{PF}_{i,t} + \beta_4^q \text{Global}_t \times \text{PF}_{i,t}$$

- Mapping between **current** variables and policy frameworks/ structural characteristics ($\text{PF}_{i,t}$) and **future** flows across quantiles q
- Intuition: factors explaining large outflows (low q) may be different from factors explaining large inflows (high q)
- Can be applied to flows at different future horizons h . We consider predictions of capital flows in short-term (2 quarters ahead) and medium-term (5-8 quarters ahead)

... and fit predicted quantiles to a skewed t distribution.

Step 2. Use predicted quantiles to fit skewed t distribution (Adrian, Boyarchenko, Giannone, 2018):



In empirical analysis we look at gross portfolio inflows to the EMs..

- **Gross portfolio inflows** are net non-resident purchases of EM assets other than those recorded as direct investments.
- Because of rising importance of gross outflows, dynamics in net inflows cannot be attributed to changes in foreign investors' behavior only (Forbes and Warnock, 2012).
- Compared to foreign direct investment, portfolio investments are more sensitive to the impact of idiosyncratic global shocks and thus more volatile (Pagliari and Hannan, 2017).

...and follow existing literature when looking at determinants of flows.

- We consider a panel of 35 emerging economies over the period 1996Q1-2018Q4
- **Dependent variable:** Total gross portfolio flows to GDP (quarterly)
- **Global drivers:** investor risk appetite measured by U.S. corporate BBB spread and yield, US 10-year yields, US dollar (DXY index)
- **Country-specific factors:** GDP growth, GDP per capita, capital account openness, short-term FX debt to reserves, financial market depth, integration with global financial markets, plus country fixed effects
- **Policy frameworks:** macroprudential policy activism, exchange rate flexibility, inflation targeting, and a range of structural characteristics

How important are global factors in explaining capital flows to the EMs?

Global factors: significance at $p=0.1$

Dependent variable: average portfolio inflows in quarters 1-2 ahead

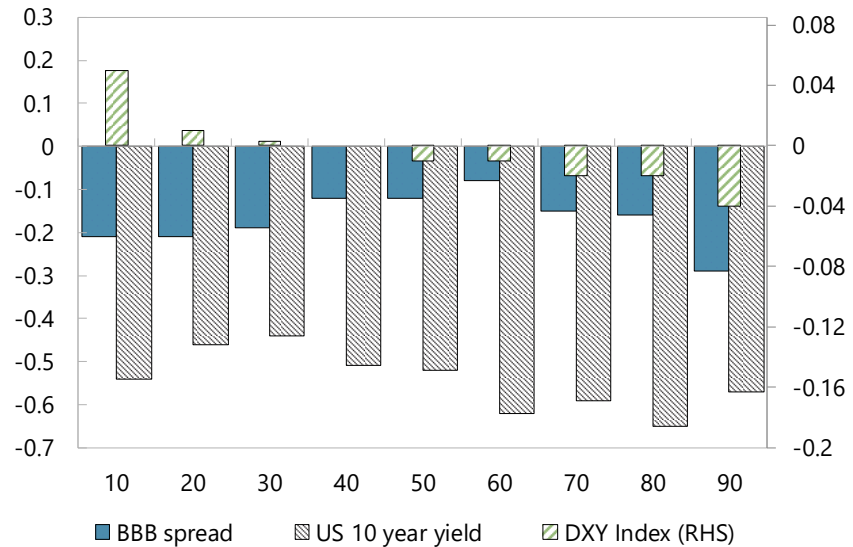
	10	20	30	40	50	60	70	80	90
BBB spread	-0.21	-0.21	-0.19	-0.12	-0.12	-0.08	-0.15	-0.16	-0.29
US 10 year yield	-0.54	-0.46	-0.44	-0.51	-0.52	-0.62	-0.59	-0.65	-0.57
DXY Index (USD dollar strength)	0.05	0.01	0.003	0	-0.01	-0.01	-0.02	-0.02	-0.04

Dependent variable: average portfolio inflows in quarters 5-8 ahead

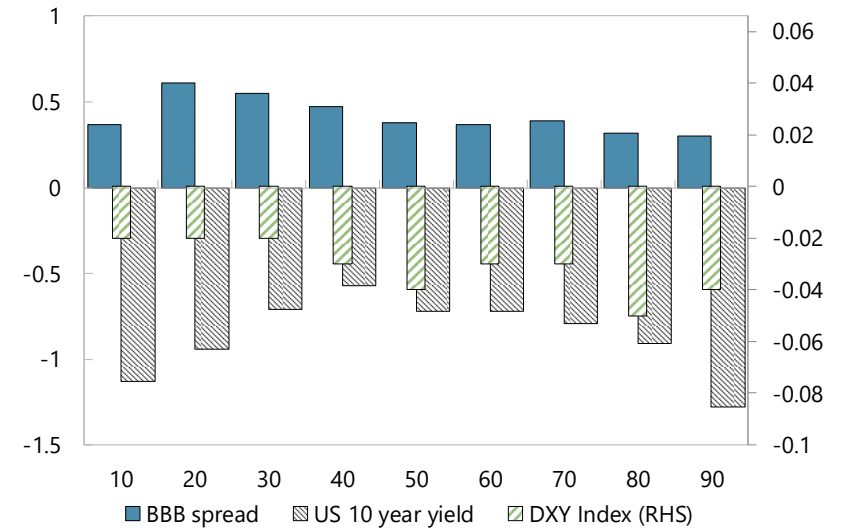
	10	20	30	40	50	60	70	80	90
BBB spread	0.37	0.61	0.55	0.47	0.38	0.37	0.39	0.32	0.3
US 10 year yield	-1.13	-0.94	-0.71	-0.57	-0.72	-0.72	-0.79	-0.91	-1.28
DXY Index (USD dollar strength)	-0.02	-0.02	-0.02	-0.03	-0.04	-0.03	-0.03	-0.05	-0.04

Global factors seem relatively more important for explaining large inflows and outflows than flows in "normal times".

Estimated Coefficients on Global Variables by Quantile:
Short Term

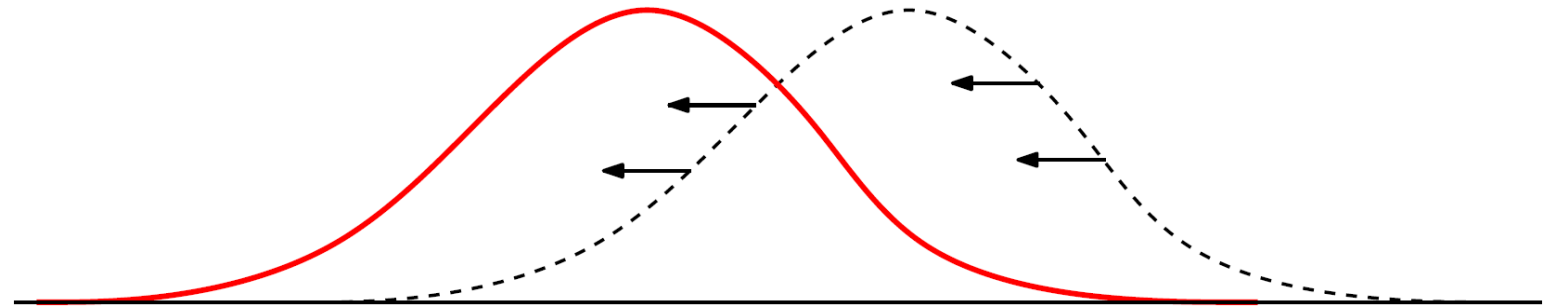


Estimated Coefficients on Global Variables by Quantile:
Medium Term

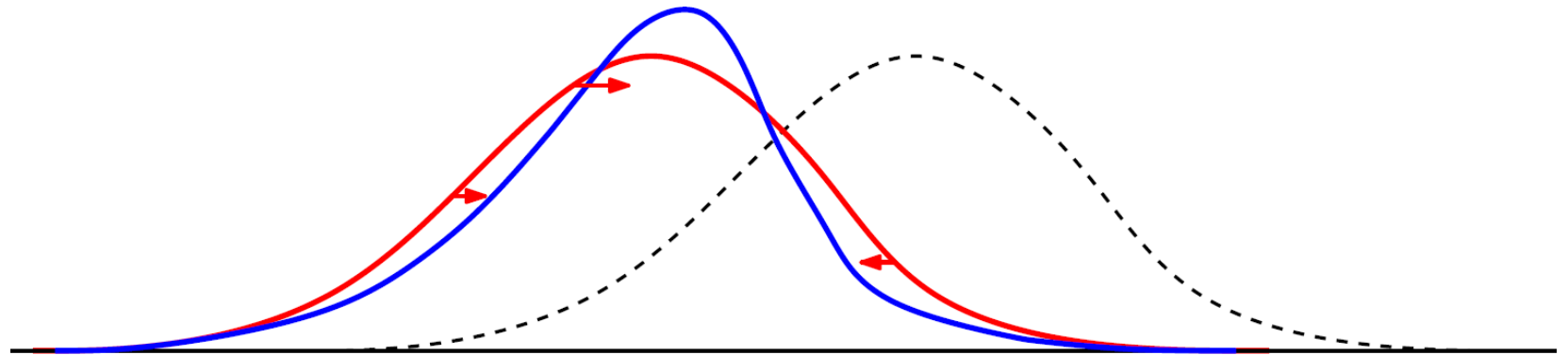


How do domestic policy frameworks affect these outcomes?

Consider a sudden increase in the US corporate BBB yield, which shifts the distribution of future domestic portfolio inflows to the left:



We find that some policies/frameworks shift the flows distribution *conditional on the global shock* such that tail risks are reduced:



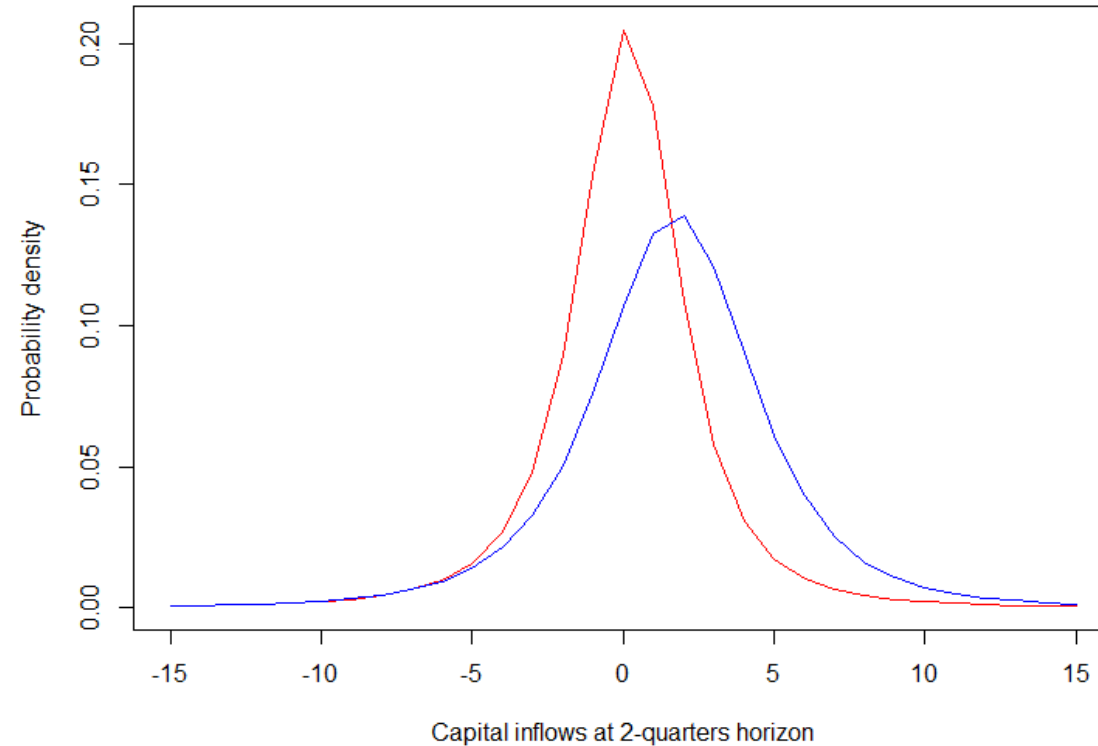
To study the impact of policy frameworks we interact them with the global factor.

$$\left(\frac{Flows}{GDP}\right)_{i,t+h|h}^q = \alpha_i^q + \beta_1^q US\ BBB\ yield_t + \beta_2^q Domestic_{i,t} + \beta_3^q PF_{i,t} + \beta_4^q US\ BBB\ yield_t \times PF_{i,t} + \beta_5^q US\ BBB\ yield_t \times FinInt_{i,t}$$

- To study policy frameworks, we consider one global factor (US corporate BBB yield) and one interaction term with a policy framework at a time.
- In our preferred specification we control for financial integration with global markets ($FinInt_{i,t}$) and its interaction with the global factor.
- We use the Bekaert et al. (2011) measure of financial integration, which we extend till 2018. Yet, this brings our sample down to 18 countries.

In the short term, better developed financial markets and macroprudential activism are associated with a milder impact of a global shock.

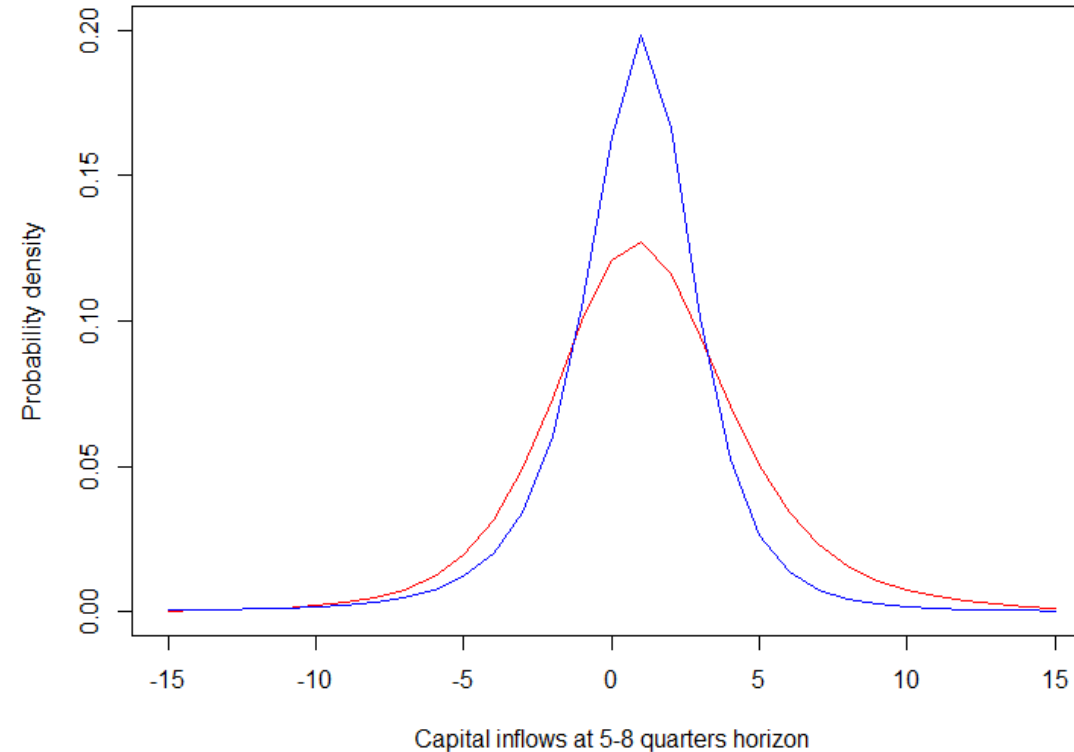
Financial market development and shock to US corporate yield: short term



Distribution of near-term portfolio inflows after a global shock when: **financial markets are shallow** vs **financial markets are well developed**

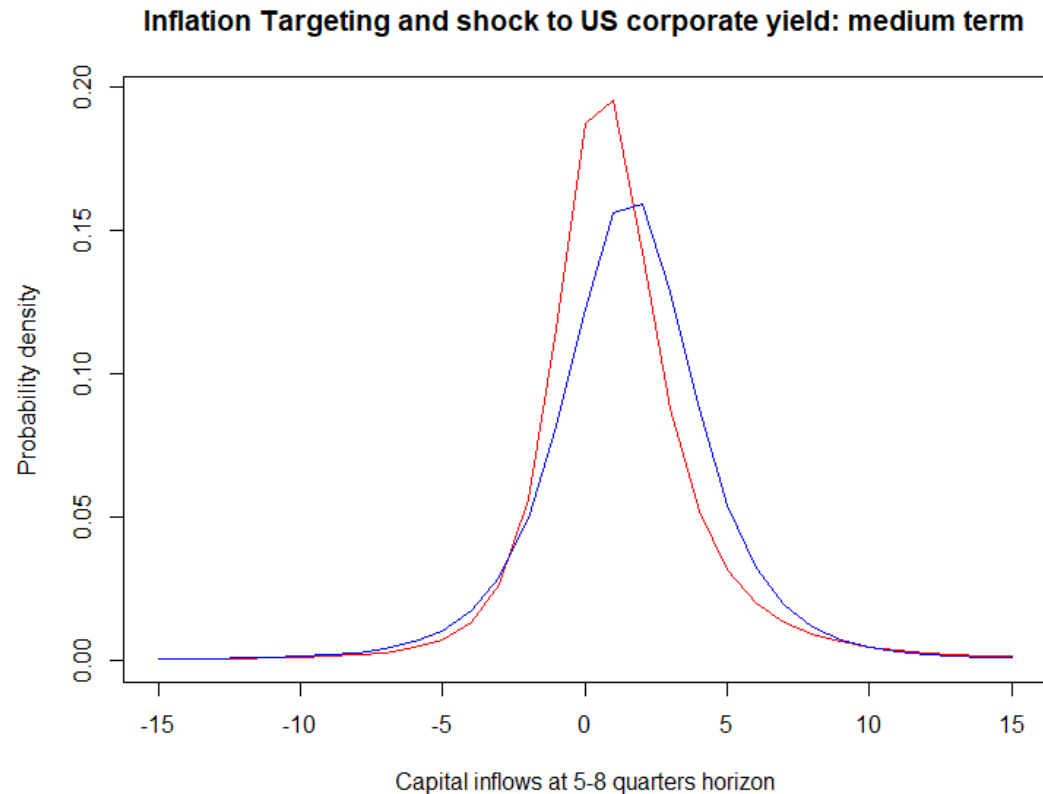
In the medium term, good domestic institutions are linked with lower volatility of flows.

Rule of Law and shock to US corporate yield: medium term



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

Inflation targeting and more flexible ER support a rebound of capital flows *in the medium term...*

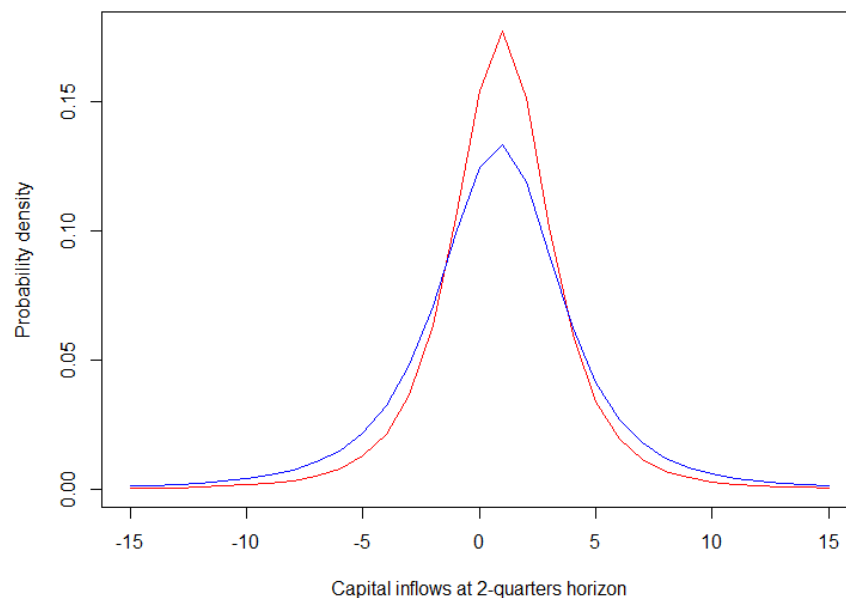


Distribution of medium-term portfolio inflows after a global shock when:
non-inflation targeting mon policy vs **inflation targeting mon policy**

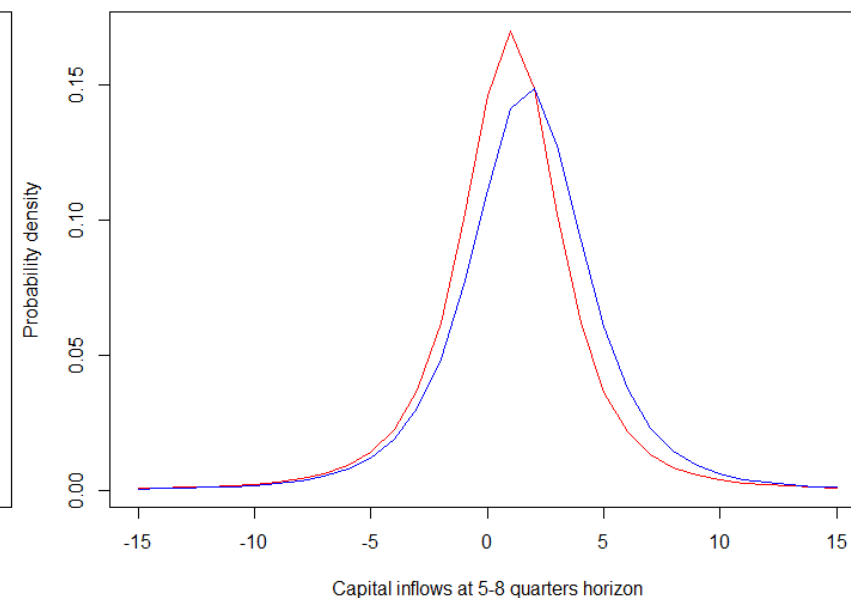
Countries with more flexible exchange rates and with inflation targeting experience more volatile portfolio inflows in the short term but a stronger rebound of inflows in the medium term.

... but both are associated with *intertemporal tradeoffs*.

ER Flexibility and shock to US corporate yield: short term



ER Flexibility and shock to US corporate yield: medium term

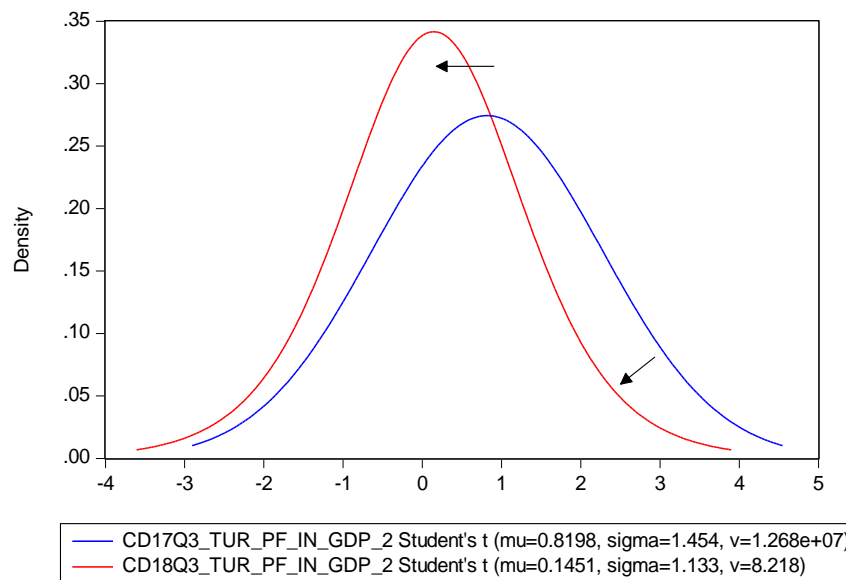


Distribution of near- and medium-term portfolio inflows after a global shock when:
exchange rate is more rigid vs **exchange rate is more flexible**

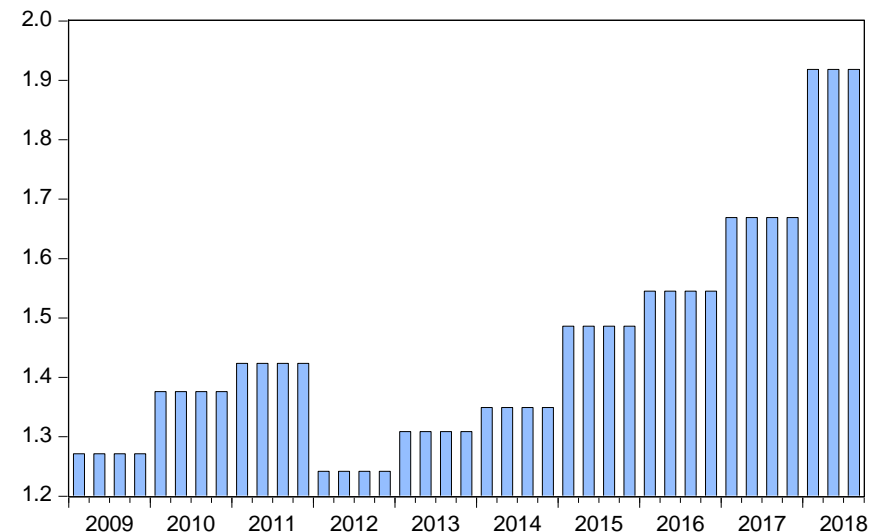
Which domestic factors affect capital flows vulnerabilities? (country-level regression)

Risks to portfolio inflows to Turkey increased between 2017Q3 and 2018Q3, driven by a rise in the domestic balance sheet vulnerabilities.

Turkey: Conditional Forecast Distribution of Average Portfolio Flows (as % of GDP), as of 18Q3 vs. 17Q3



Turkey: Ratio of Short-Term External Debt to FX Reserves



Potential endogeneity issues

- To explore: controlling for potentially endogenous adoption of IT and other frameworks (e.g. Lin and Ye 2007, 2009)
- Reverse causality less likely when it comes to more structural characteristics. Still, will seek instruments – but IV in quantile regression is tricky (Chernozhukov and Hansen 2006, and Galvao 2011)
- Policy actions (not yet shown): most likely to be endogenous. Will work with policy surprises as in Brandao, Gelos, Narita, and Nier (2019).

Conclusions

Key takeaways:

- We find that some domestic policy frameworks and structural characteristics are associated with *milder* effects of global shocks...
- ...but also that some frameworks involve intertemporal tradeoffs.
- We propose a new "Capital Flows at Risk" approach to study determinants of and quantify risks to capital flows, which has many potential applications.

Work in progress:

- Endogeneity
- Analyze policy *actions* (capital flow measures, monetary policy, macroprudential policy)
- Look at interactions of different policy actions and policy frameworks, and the regional contagion channel