



The Policy Trilemma and the Global Financial Cycle: Evidence from the International Transmission of Unconventional Monetary Policy

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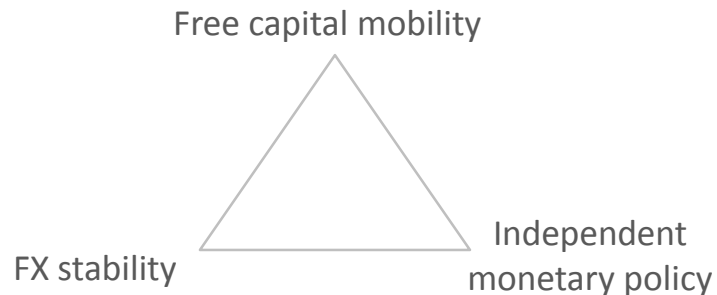
Banca d'Italia, 22 November 2018

Two views on international spillovers and exchange rate regime

Flexible exchange rate economies are more insulated to external shocks

A reflection of the Mundellian Trilemma

Countries can attain just 2 of 3 objectives



Flexible FX are not enough to insulate the economy

Because of the Global Financial Cycle (Rey, 2013)

Developments in the United States



International comovement in financial prices and aggregates (the Global Financial Cycle)

All countries are subject to this Cycle regardless of FX regime

Which view dominates?

A Global VAR to assess the international spillovers of US monetary policy

A model of the global economy

- 33 interconnected economies (>90% of world GDP)
- Full country heterogeneity in parameters
- Account for third-country & spillback effects

Identify both conventional & unconventional shocks

- Theory-based sign restrictions on US variables
- Agnostic on spillovers (unrestricted responses of RoW)

Results support Helene Rey's view of the Global Financial Cycle

US monetary policy drives equity prices worldwide and lead to high financial comovement (and especially so with unconventional measures)

Weak evidence that flexible FX imply smaller spillovers

Road map

1. The GVAR

- Structure of the model
- Identification strategy

2. International spillovers from US monetary policy

- Conventional monetary policy
- Unconventional monetary policy
- Sources of international spillovers

3. Conclusions



Countries in the GVAR

33 advanced & emerging economies (accounting for more than 90% of world GDP)

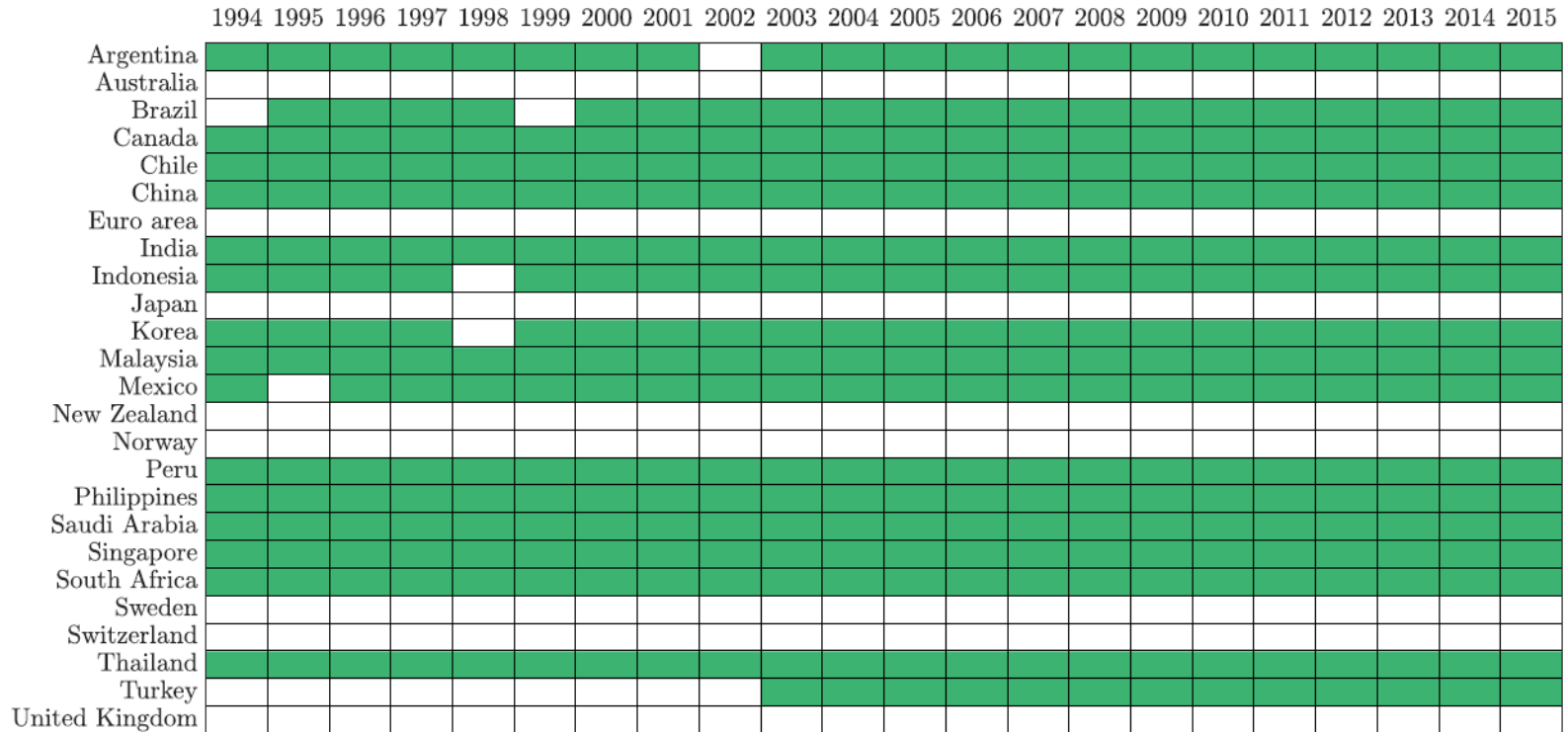
United States	Euro area*	Latin America
China	Germany	Brazil
Japan	France	Mexico
United Kingdom	Italy	Argentina
Canada	Spain	Chile
Australia	Netherlands	Peru
New Zealand	Belgium	
	Austria	
	Finland	
Rest of Asia	Rest of Western Europe	Rest of the World
Korea	Sweden	India
Indonesia	Switzerland	South Africa
Thailand	Norway	Turkey
Philippines		Saudi Arabia
Malaysia		
Singapore		

* We treat the euro area as a regional model (as in Déés et al. 2007)

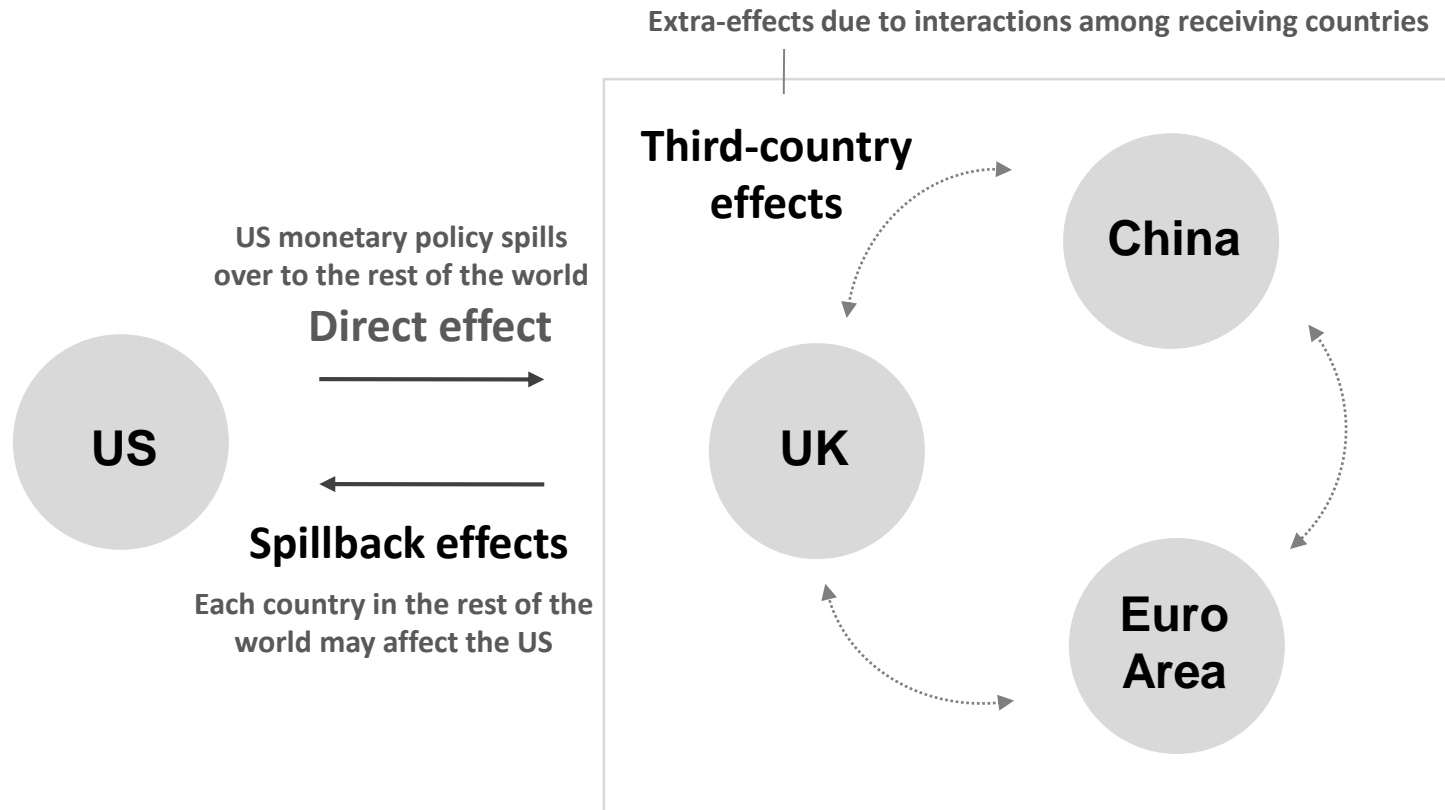
Several countries anchor their currencies to the US Dollar

USD anchor index of Ilzetzki, Reinhart & Rogoff (2017)

USD anchor holds
 No USD anchor



The GVAR consists of a network of country-specific models



The country-specific VARX models

Each economy depends on both domestic and external developments

$$Y_{it} = a_i + b_i t + \sum_{j=1}^{p_i} A_{ij} Y_{i,t-j} + \sum_{j=0}^{q_i} B_{ij} Y_{i,t-j}^* + \sum_{j=0}^{q_i} C_{ij} X_{t-j} + u_{it}$$

Domestic variables

- Real GDP growth
- CPI inflation
- Short-term interest rate
- Term spread (long – short rates)
- Real equity prices
- Nominal effective exchange rate

(quarterly data: 1994Q1 – 2016Q4)

Foreign variables

Weighted averages of other countries' domestic variables

$$Y_{it}^* = \sum_{j \neq i} w_{ij} Y_{jt}$$

weights capture the importance of country j for i
(based on bilateral trade flows)

Oil prices

- Common observed factor
- Endogenous to global developments

$$X_t = a_x + b_x t + \sum_{j=1}^{p_x} D_j X_{t-j} + \sum_{j=0}^{q_x} F_j \tilde{Y}_{t-j} + u_{xt}$$

weighted averages of GDP growth & inflation across all countries
(GDP-based weights)

Identification of US monetary policy shocks

Restrict responses of US variables

Restrictions informed by standard monetary theory

Unrestricted responses in rest of the world

Agnostic on size & sign of international spillovers



	Conventional	Unconventional
<i>Responses of US variables:</i>		
Short-term interest rate	—	0
Term spread	+	—
Inflation	+	+
Output growth	+	+
Real equity prices	+	+
NEER	—	—

← Compression of term spread raises growth and inflation, policy rate unchanged (Baumeister & Benati, 2013)

← Asset prices rise

← USD depreciates

Note: sign restrictions are imposed on impact and one period after the shock

Road map

1. The GVAR

- Structure of the model
- Identification strategy

2. International spillovers from US monetary policy

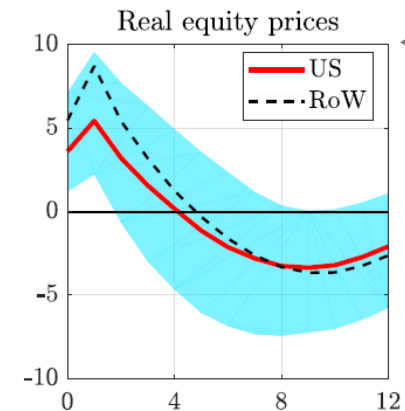
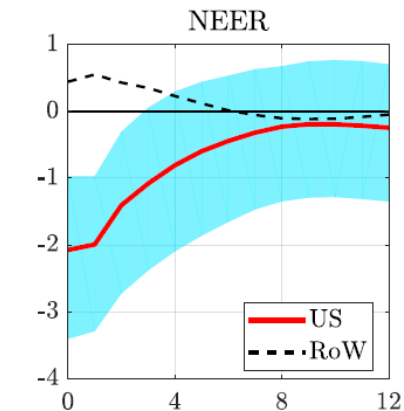
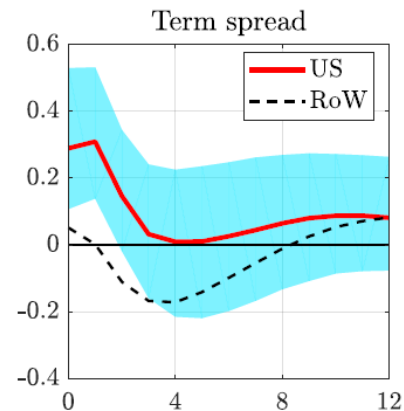
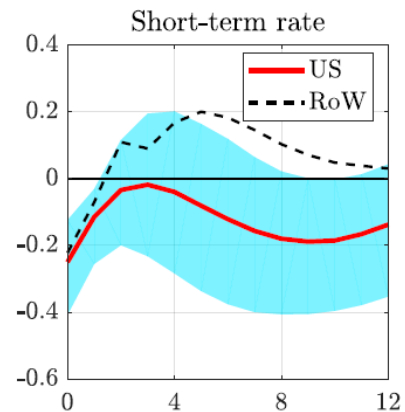
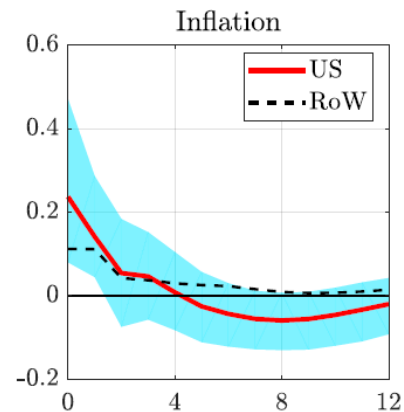
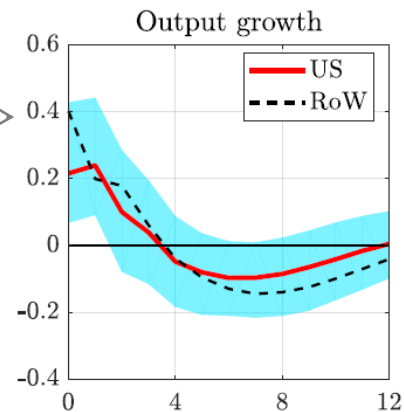
- Conventional monetary policy
- Unconventional monetary policy
- Sources of international spillovers

3. Conclusions



Drop in US policy rate: domestic and spillover effects

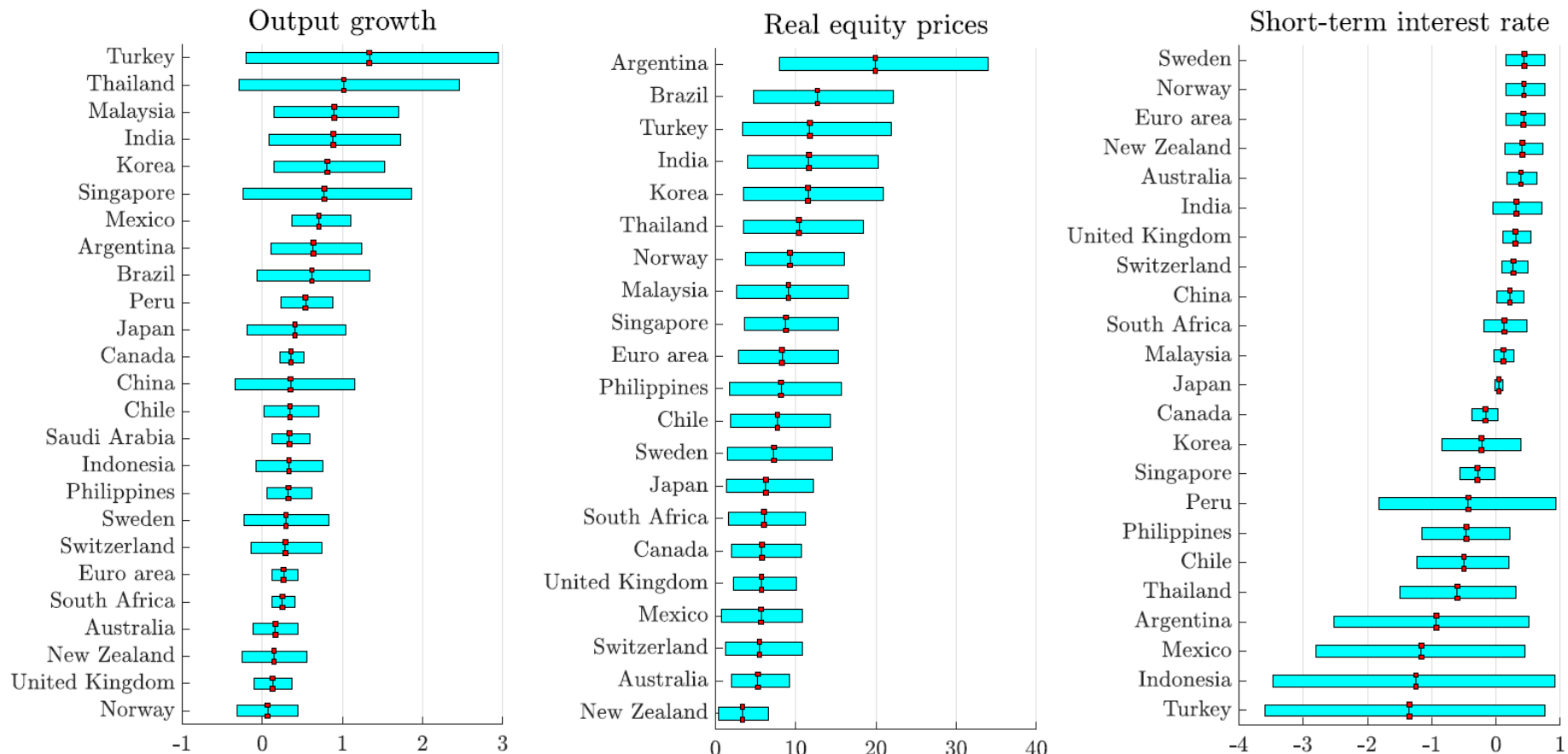
Sizable output spillovers (outside domestic effects) →



← Strong reaction of world equity prices (confirm Rey 2016)

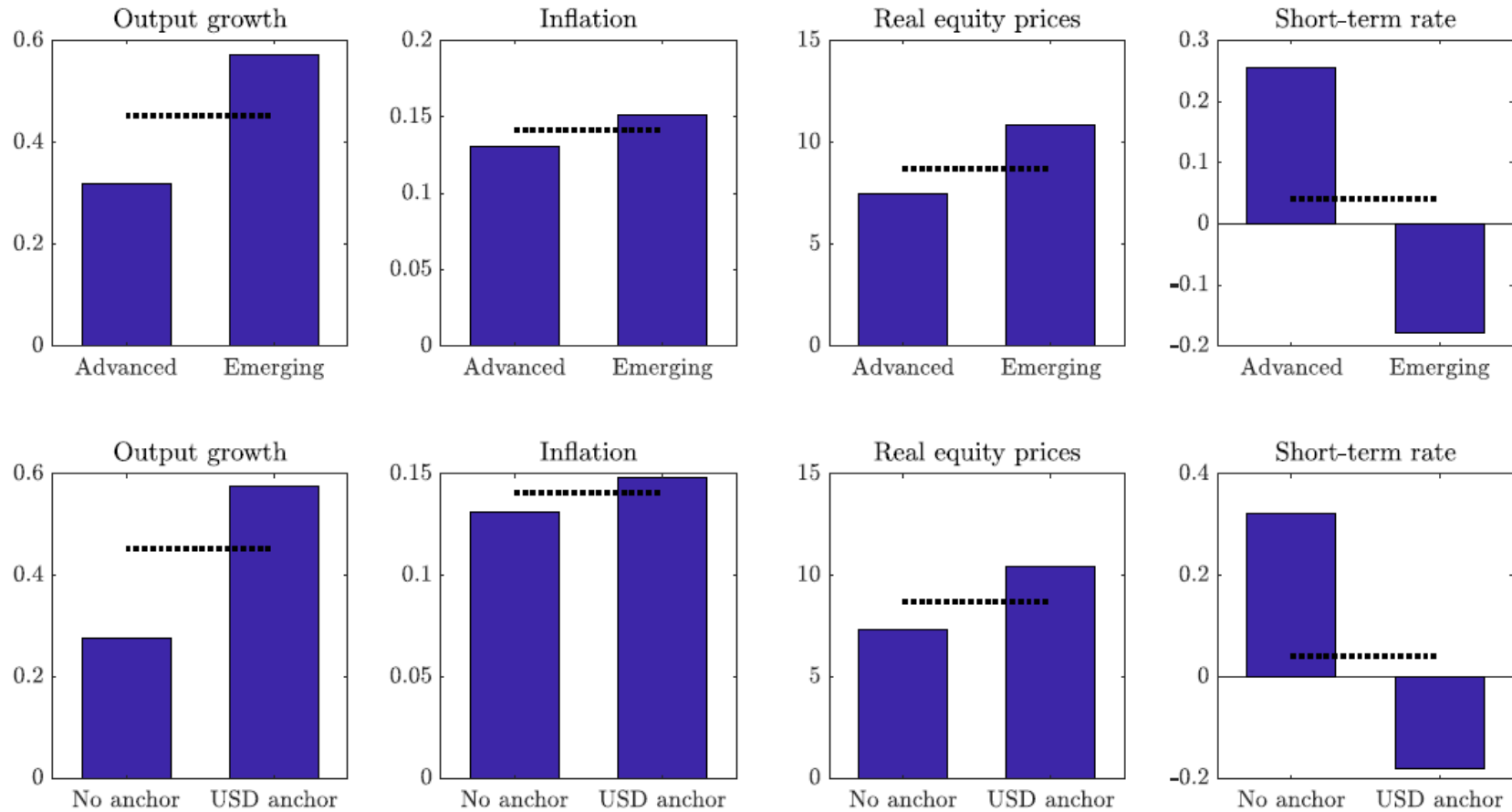
Note: median responses & 68% bands for the US and rest of the world to an expansionary US monetary policy shock (25 basis points)

Drop in US policy rate: country-level spillovers



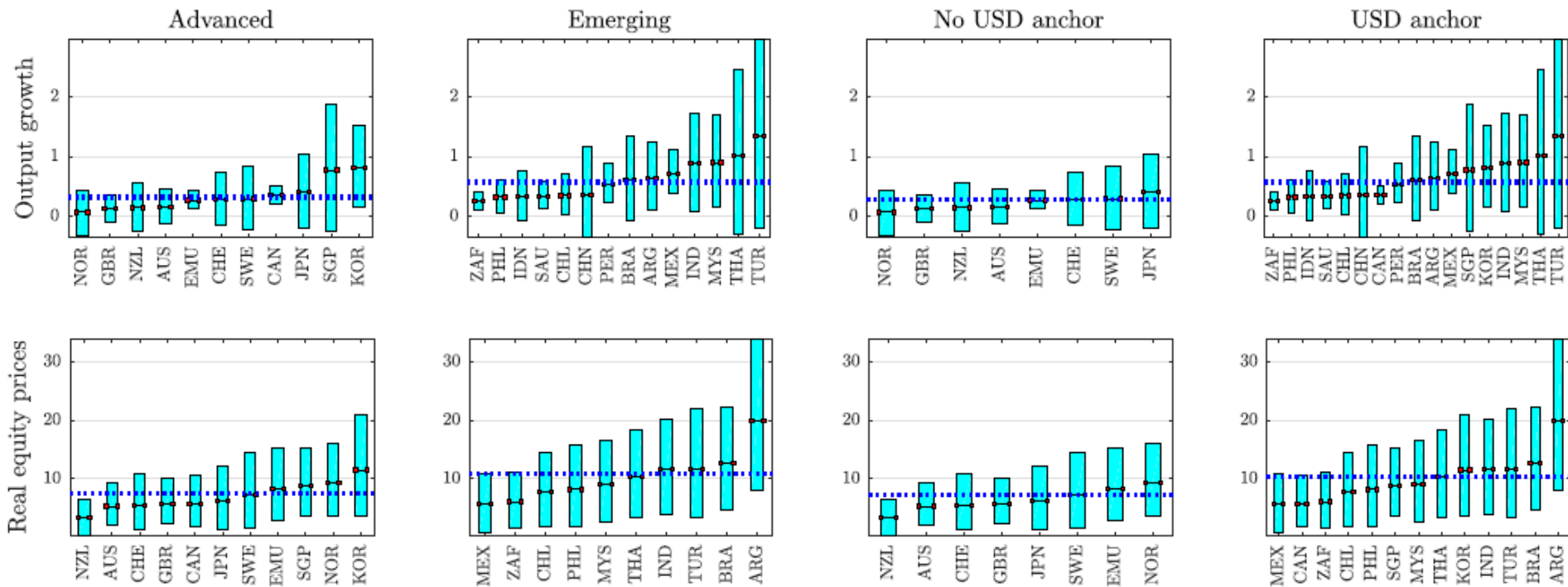
Note: maximum absolute responses and associated 68% bands

Flexible FX countries feature smaller spillovers...



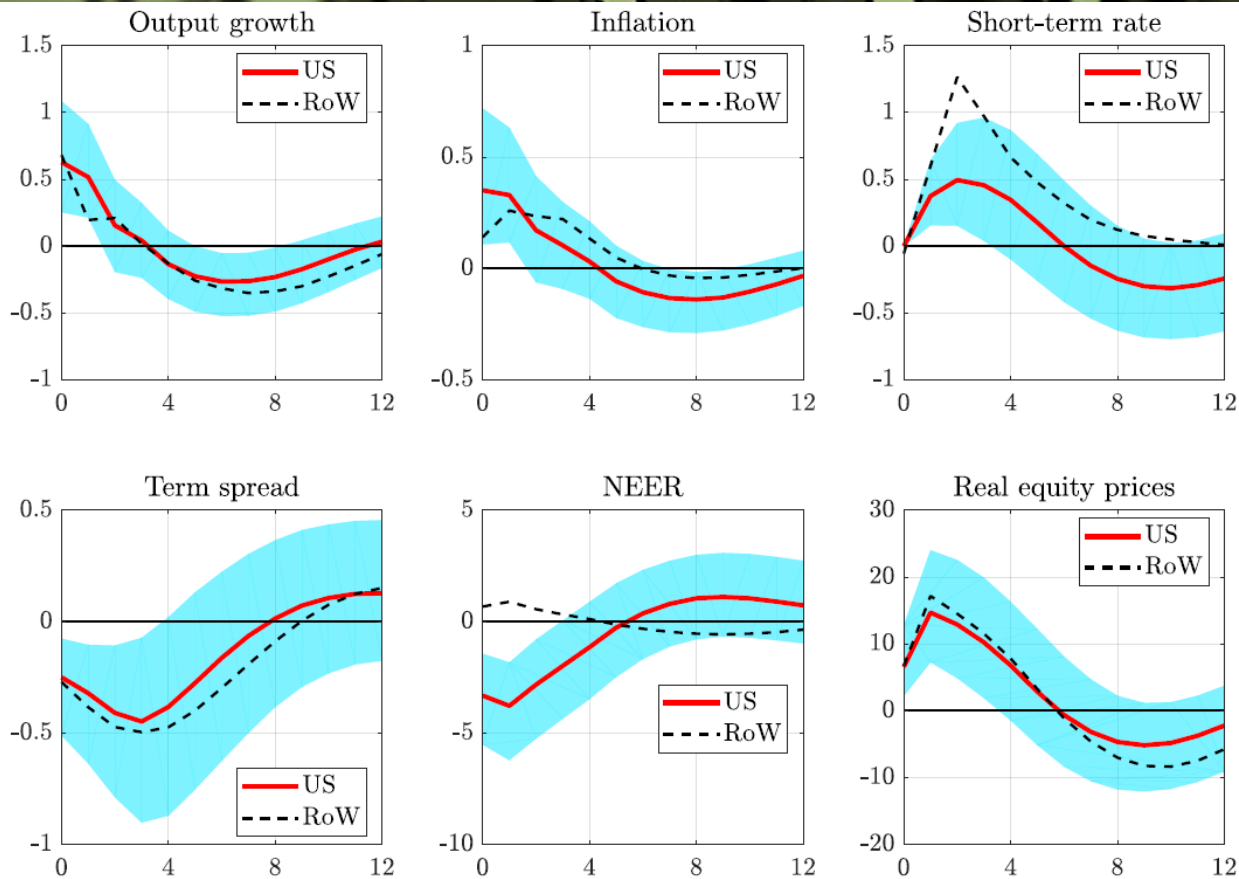
Note: GDP-weighted means for groups (in blue) and for rest of the world (dashed black)

... but the relationship is weak due to large uncertainty



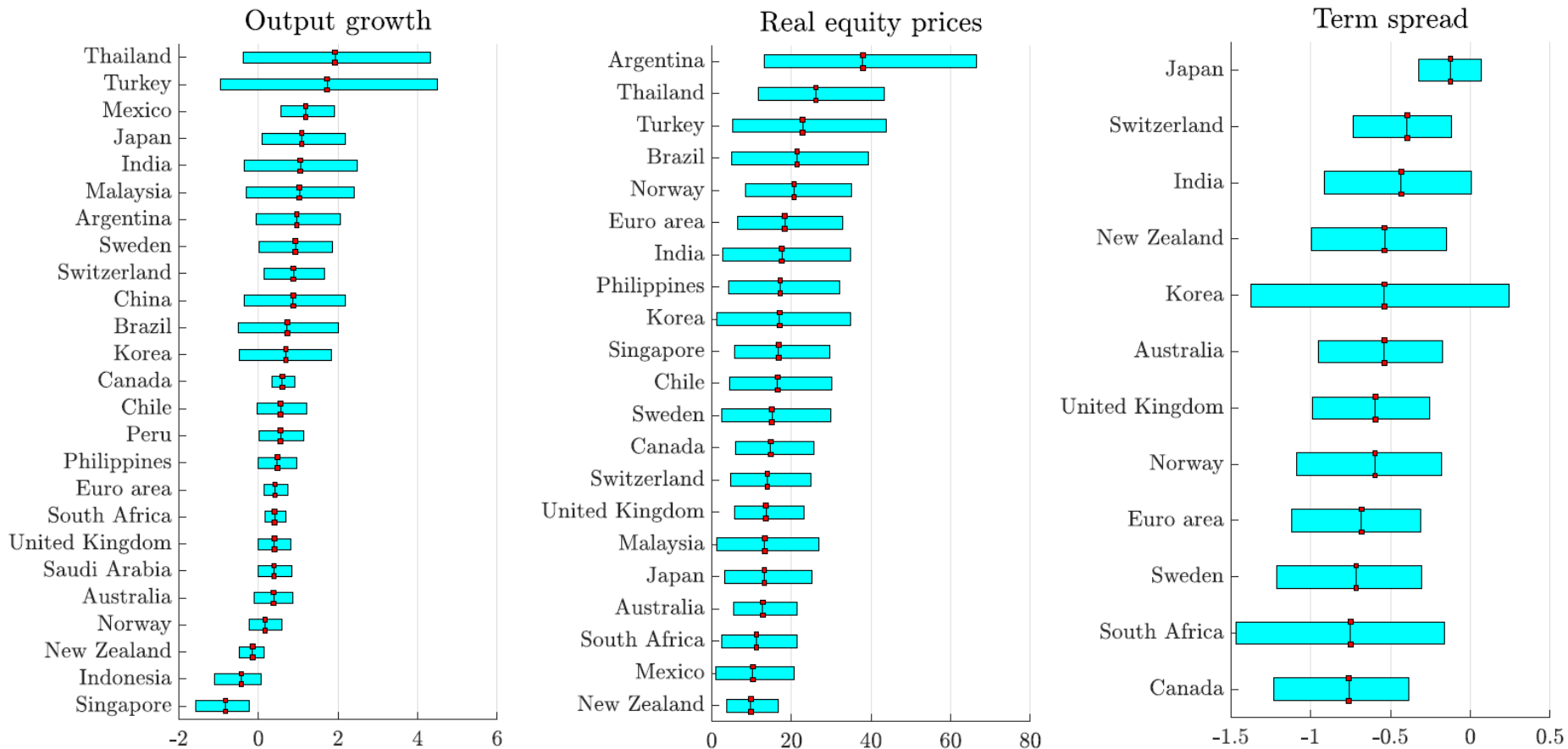
Note: maximum absolute responses and associated 68% bands, GDP-weighted group means in dotted blue

Compression in US term spread: domestic and spillover effects



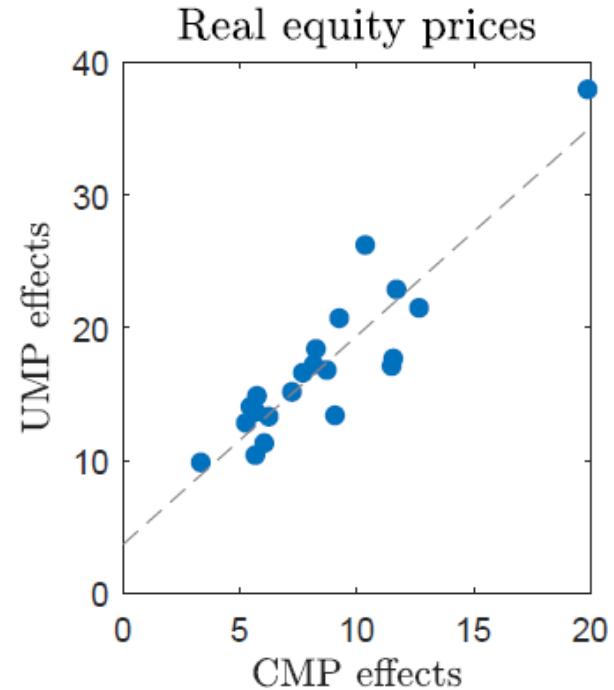
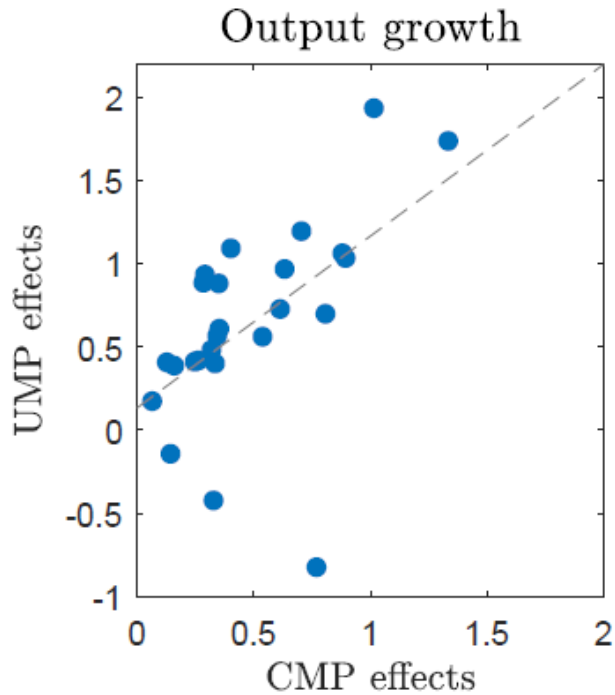
Note: median responses & 68% bands for the US and rest of the world to an expansionary US term spread shock (25 basis points)

Compression in US term spread: country-level spillovers



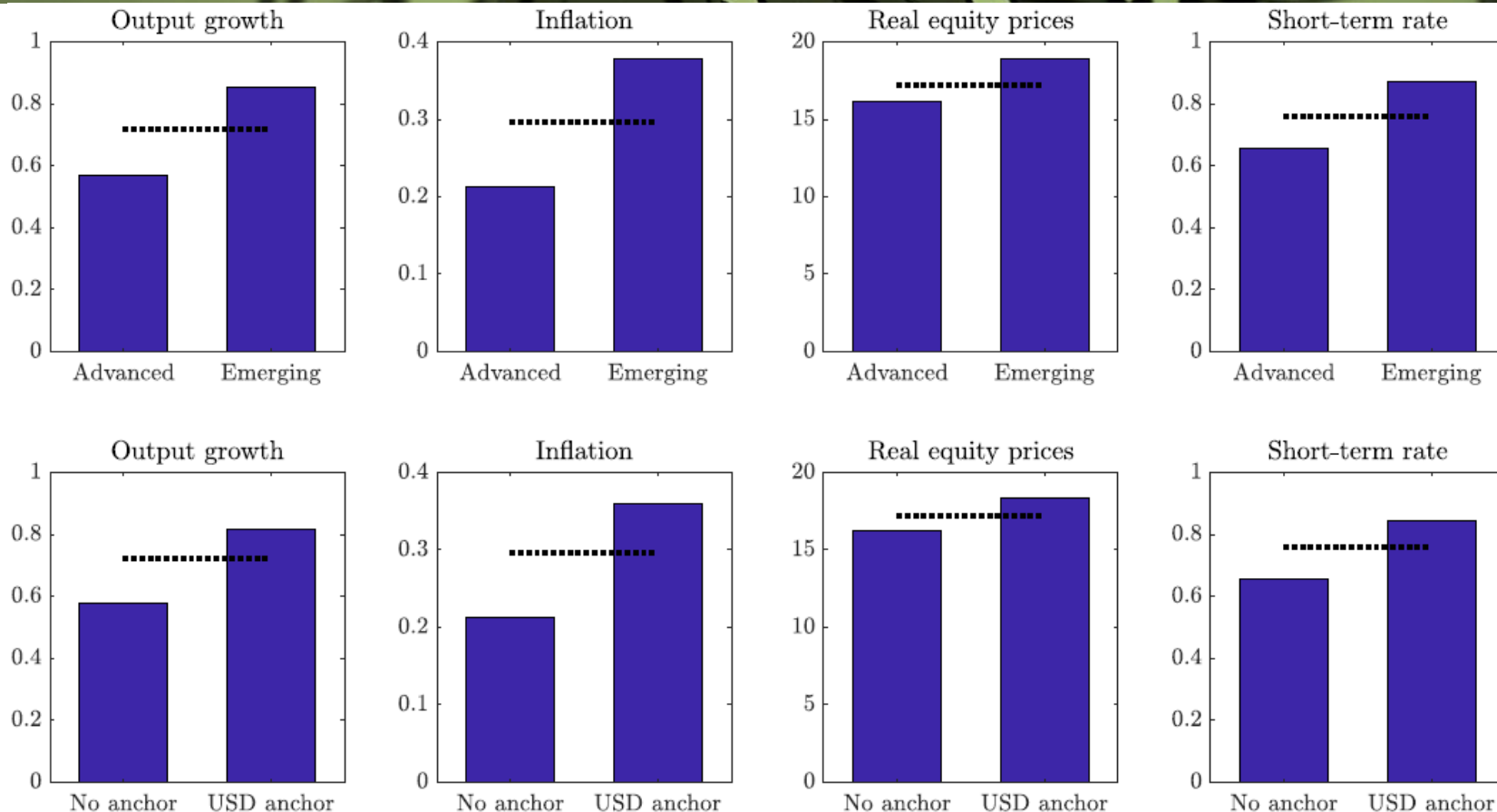
Note: maximum absolute responses and associated 68% bands

Comparing spillovers from conventional & unconventional measures



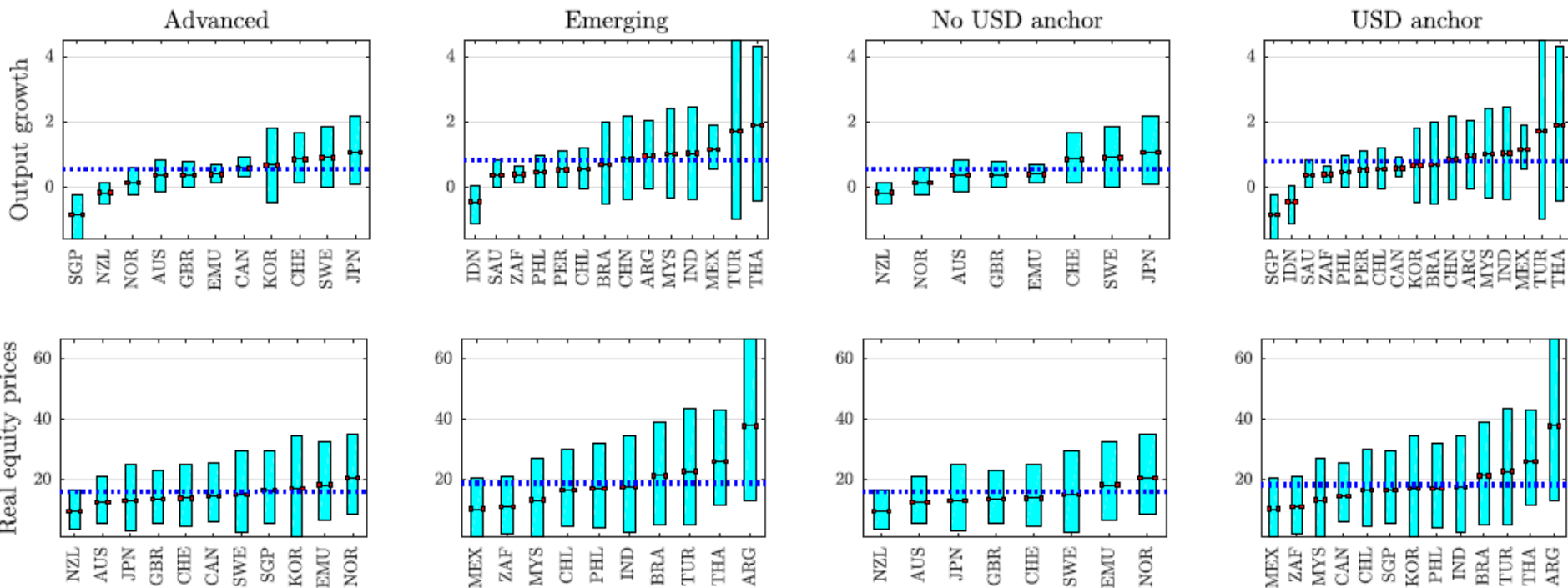
Note: maximum absolute responses to expansionary conventional (x-axis) and unconventional (y-axis) monetary policy shocks

Again, flexible FX countries feature smaller spillovers...



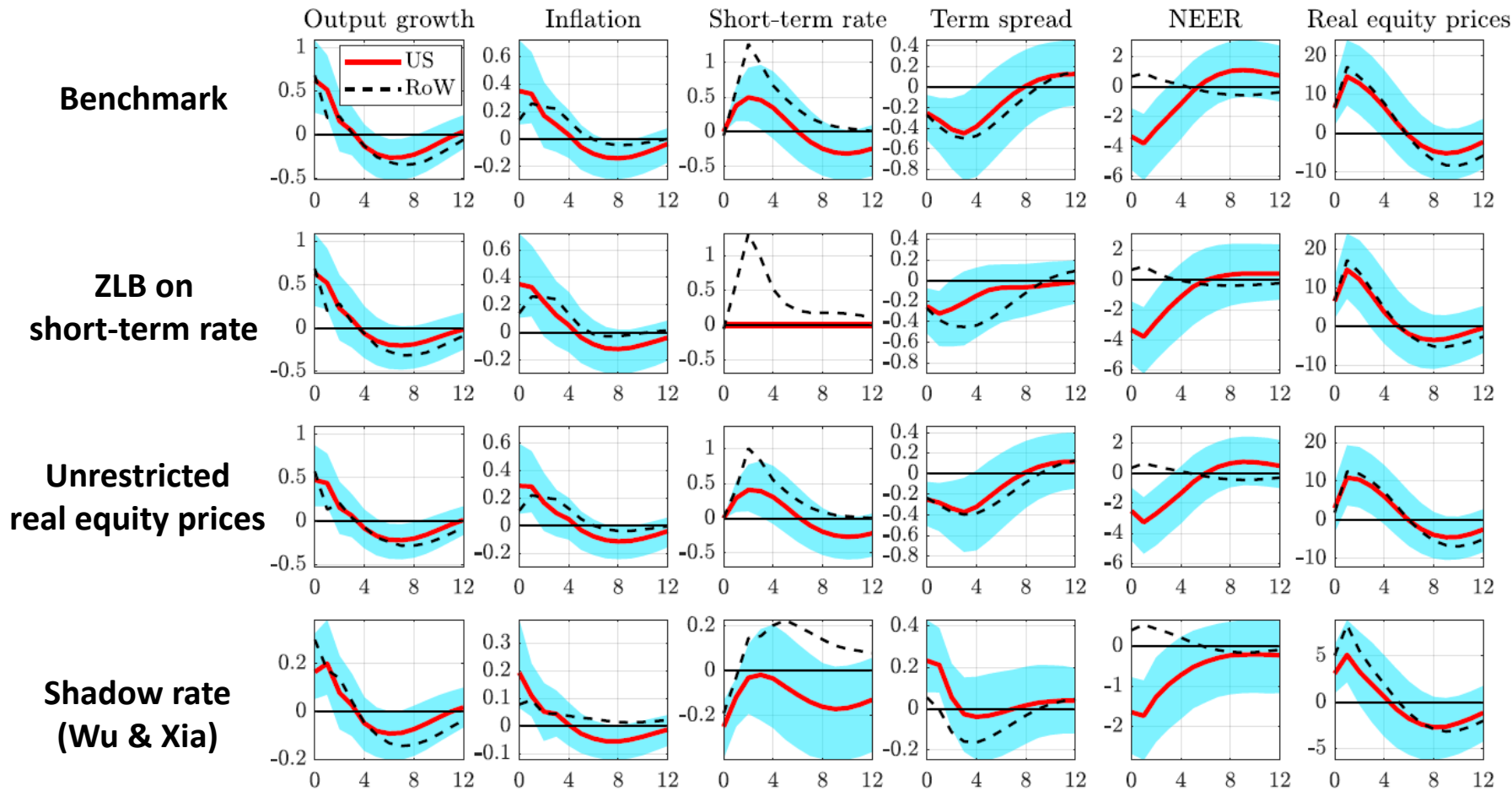
Note: GDP-weighted means for groups (in blue) and for rest of the world (dashed black)

... but large uncertainty weakens the relationship



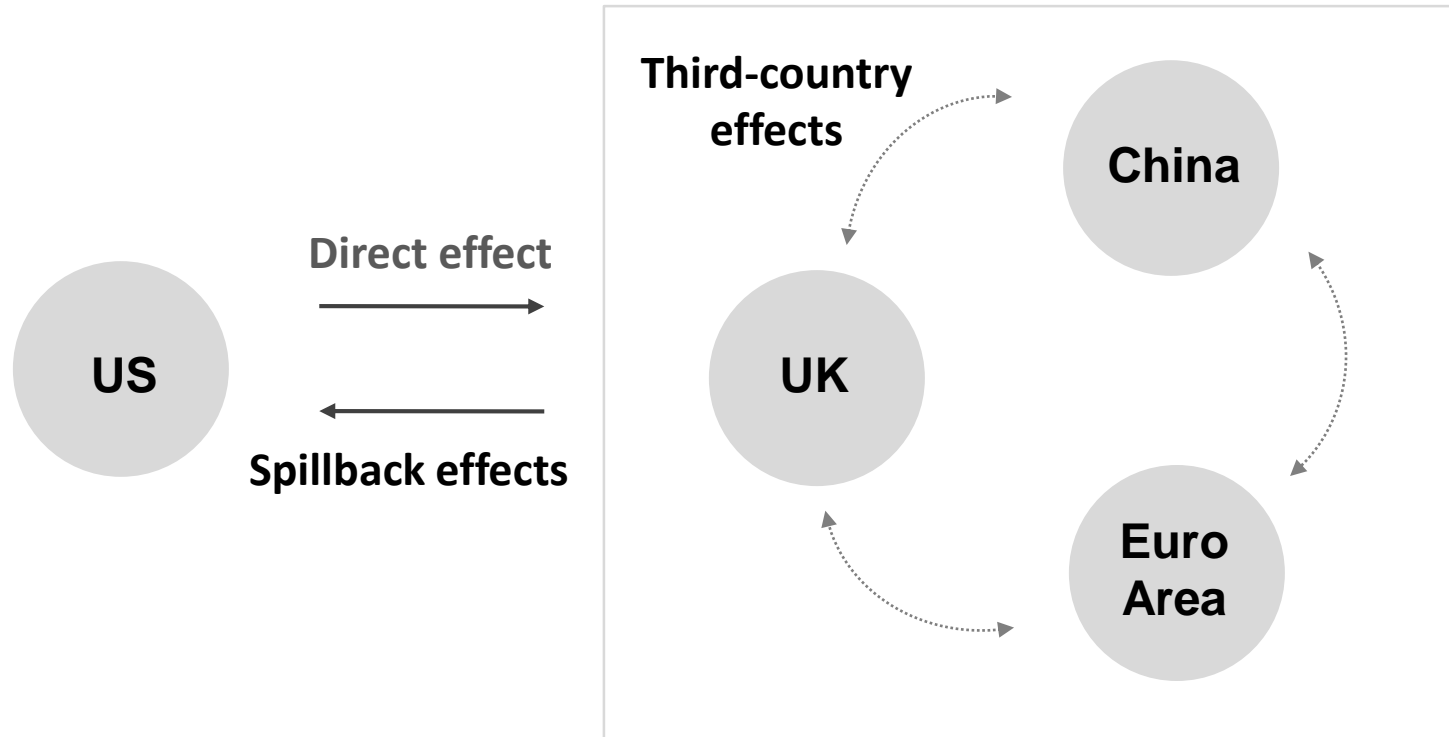
Note: maximum absolute responses and associated 68% bands, GDP-weighted group means in dotted blue

Alternative identification strategies of unconventional monetary policy



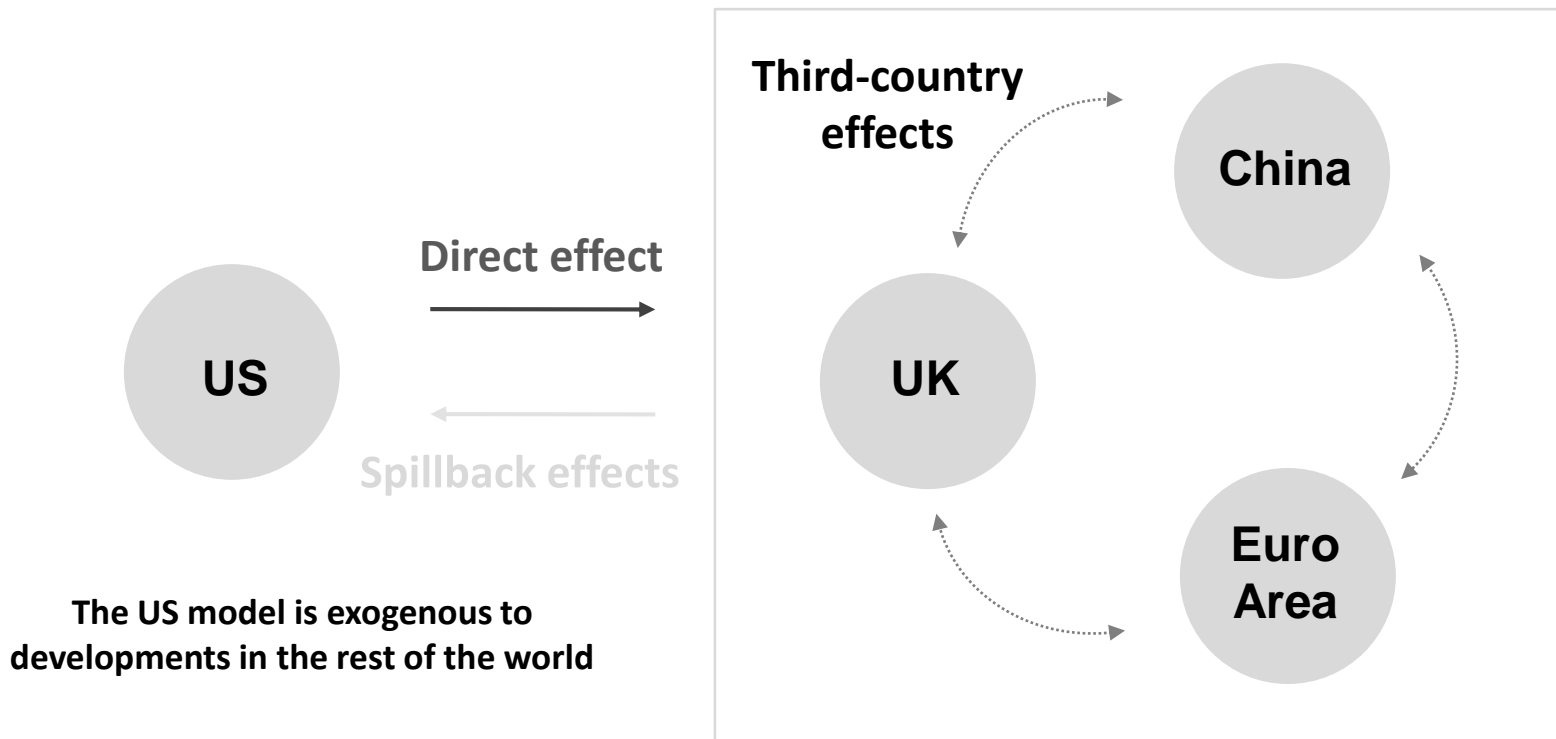
Investigating the sources of international spillovers

To what extent do spillovers depend on third-country & spillback effects?



Investigating the sources of international spillovers

Case 1: shut down spillback effects



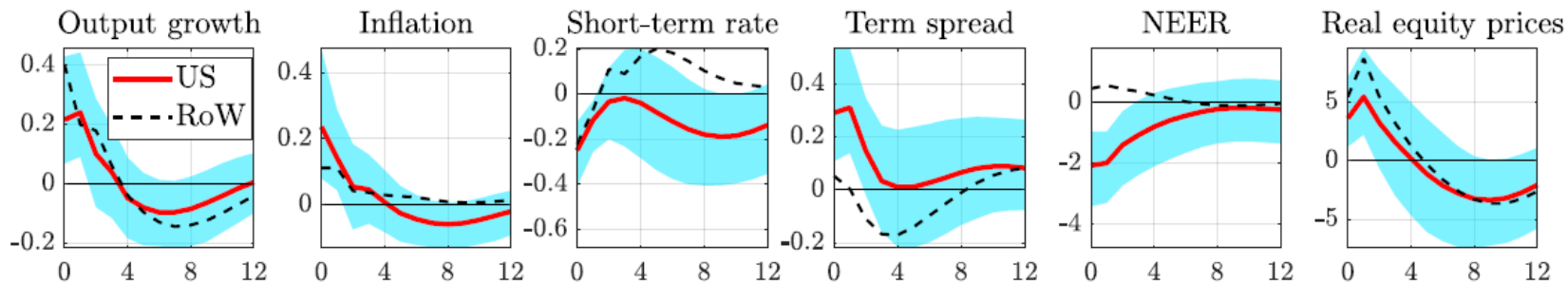
Investigating the sources of international spillovers

Case 2: shut down spillback and third-country effects

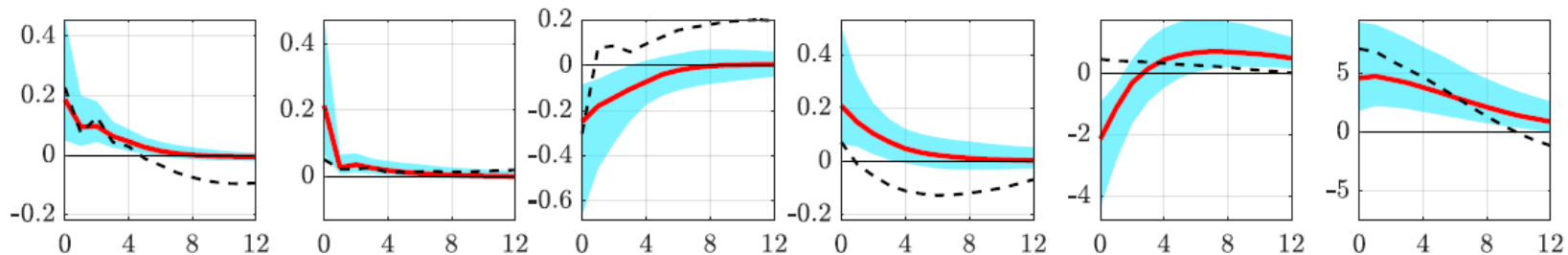


Drop in US policy rate

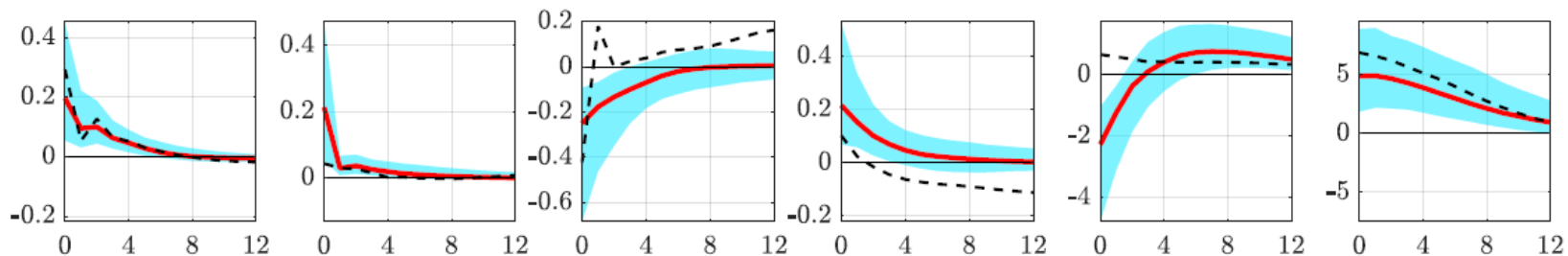
Benchmark



No spillback effects

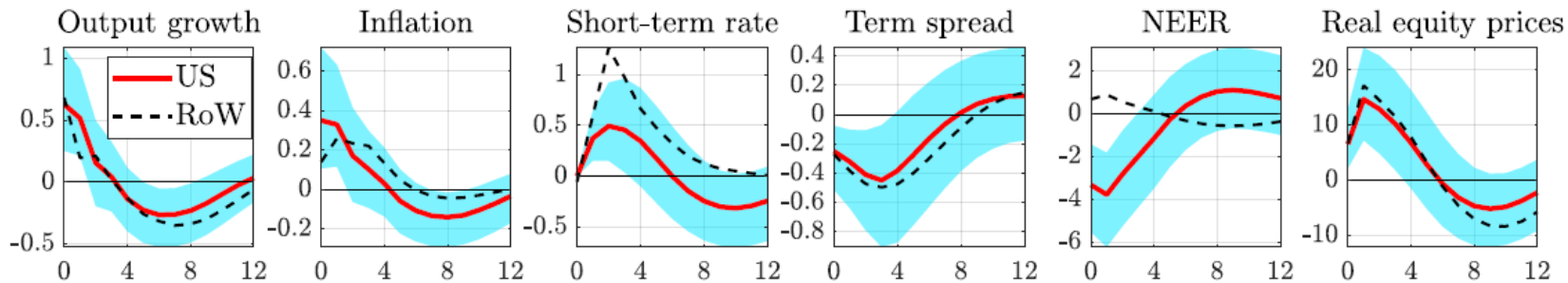


Direct effects

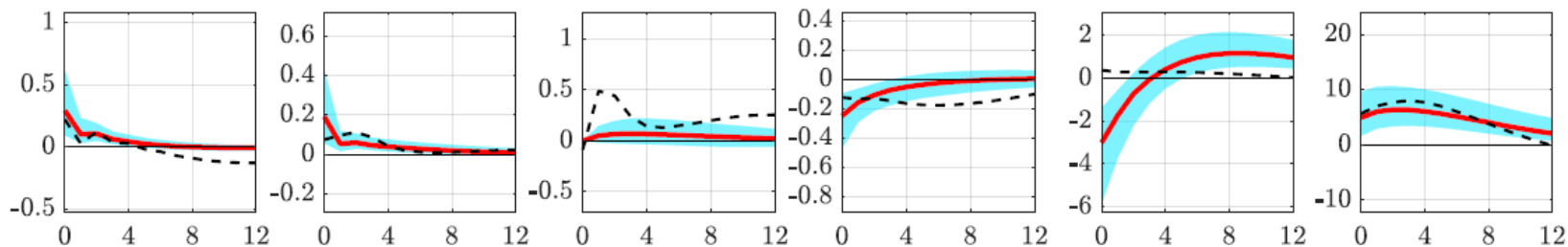


Compression in US term spread

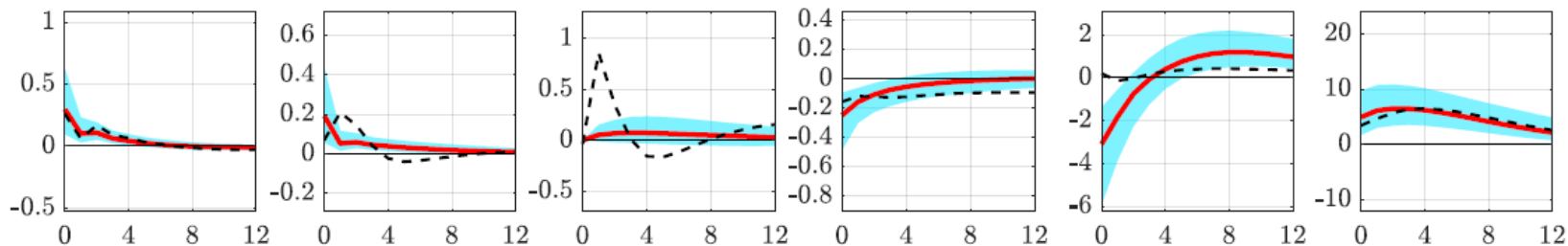
Benchmark



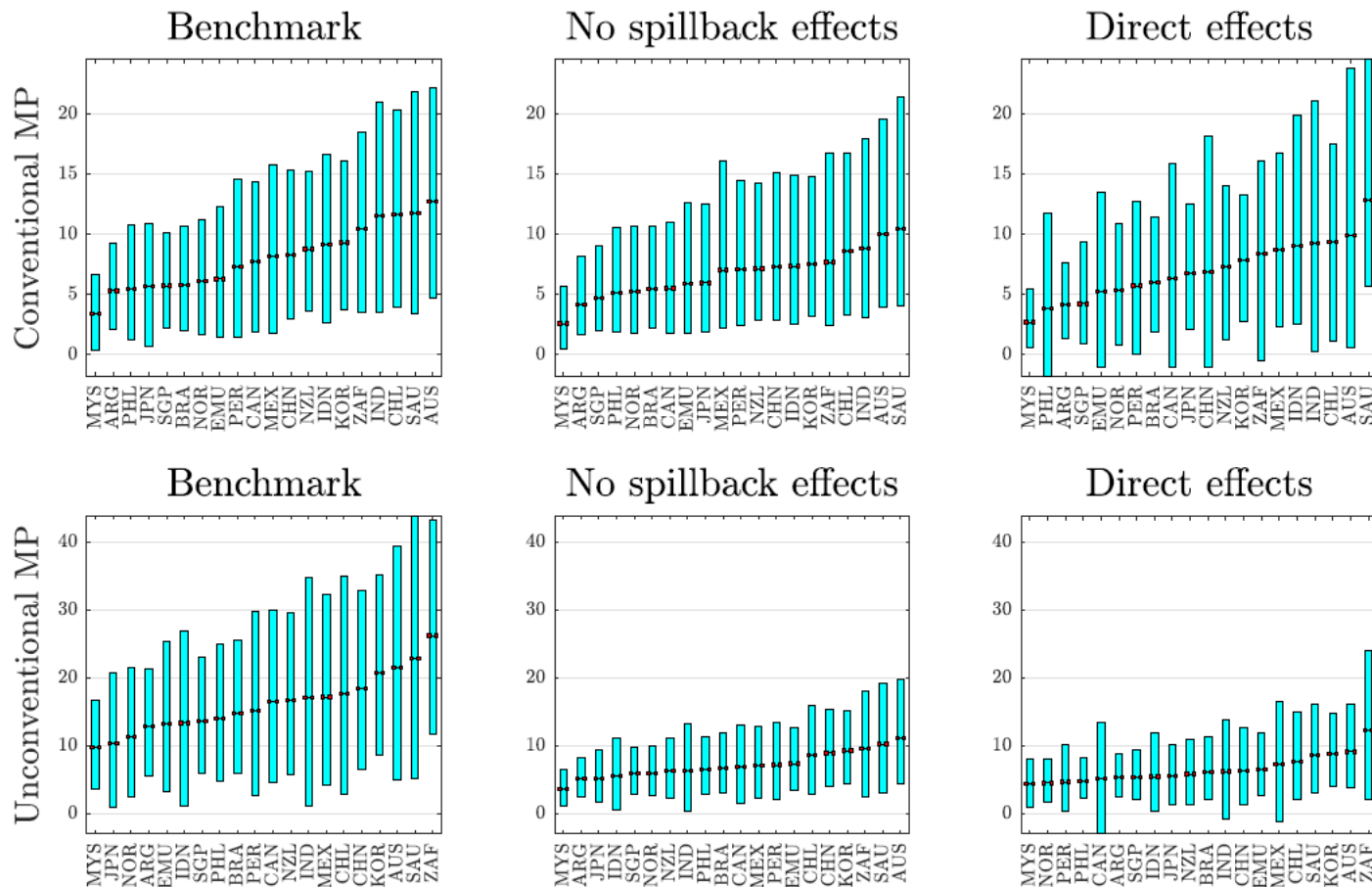
No spillback effects



Direct effects



Investigating the sources of international spillovers on equity prices



Two views on international spillovers and FX regime

Mundellian Trilemma

Flexible exchange rate economies are more insulated to external shocks

Global Financial Cycle

Flexible FX are not enough to insulate the economy

A GVAR to study the international transmission of US (un)conventional monetary policy

Allow for full country heterogeneity

Account for third-country & spillback effects

Theory-based identification strategy (agnostic about spillovers)

Results support the Global Financial Cycle's view

US monetary policy leads to high financial comovement (especially so with unconventional measures)

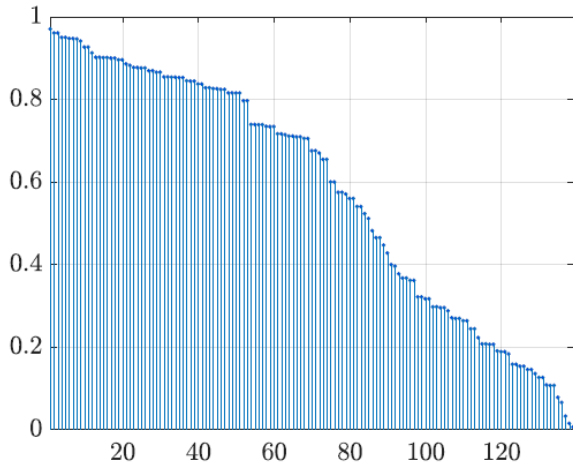
Weak evidence that flexible FX imply smaller spillovers



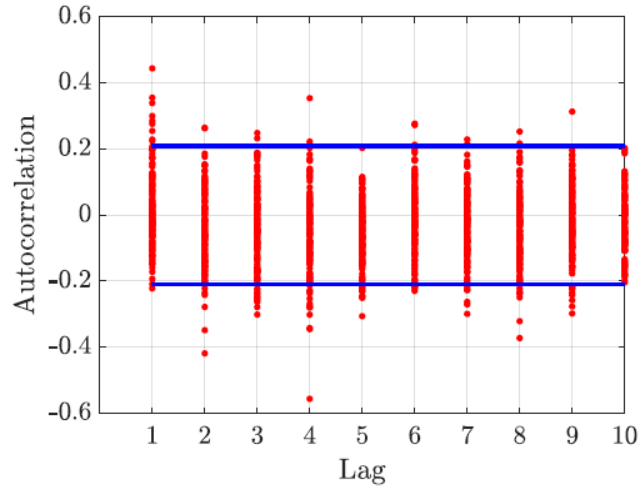
Additional slides

GVAR diagnostics

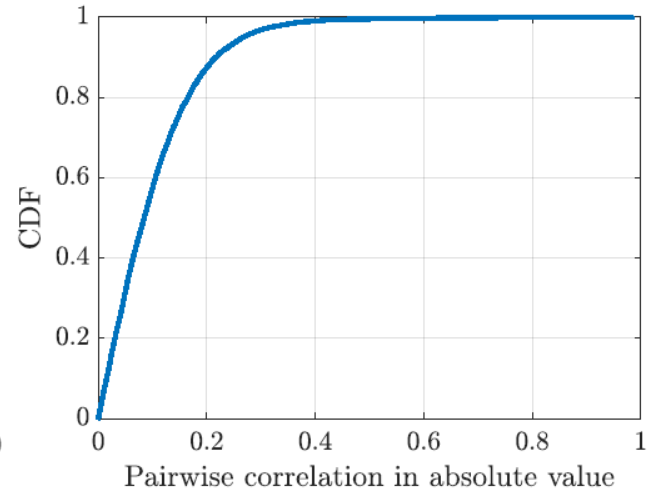
Eigenvalues of the GVAR



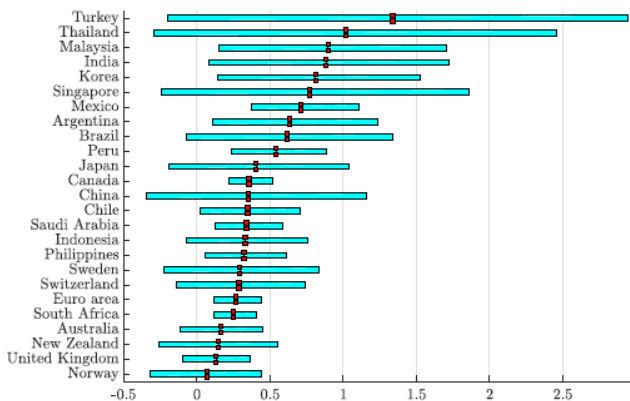
Residual serial dependence



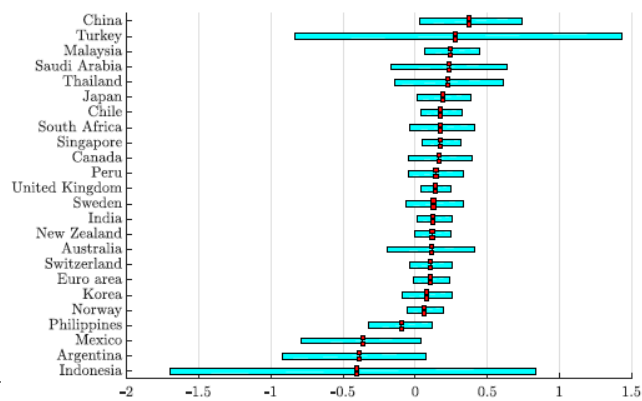
Residual cross-sectional dependence



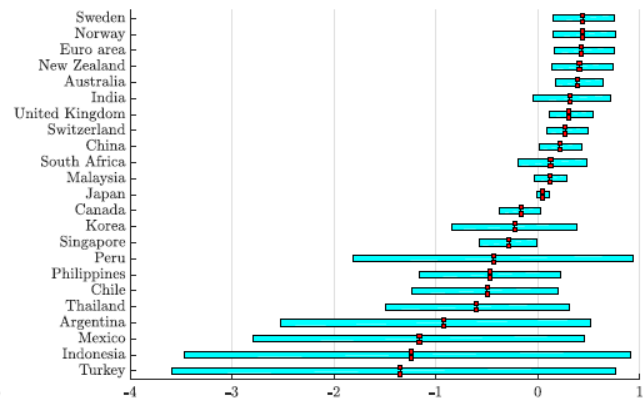
Drop in US policy rate: country-level spillovers



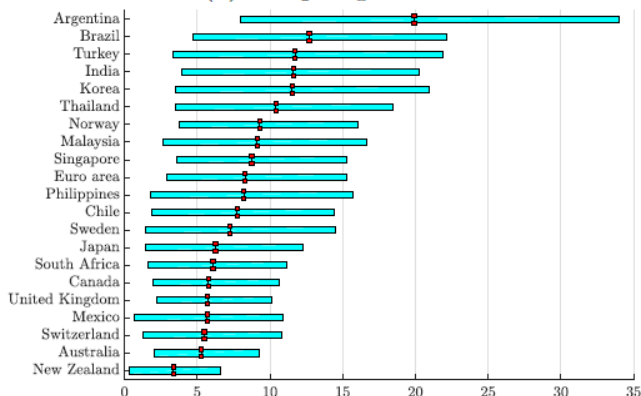
(a) Output growth



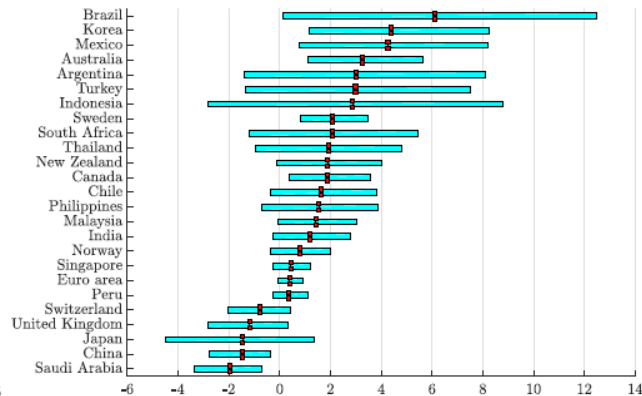
(b) Inflation



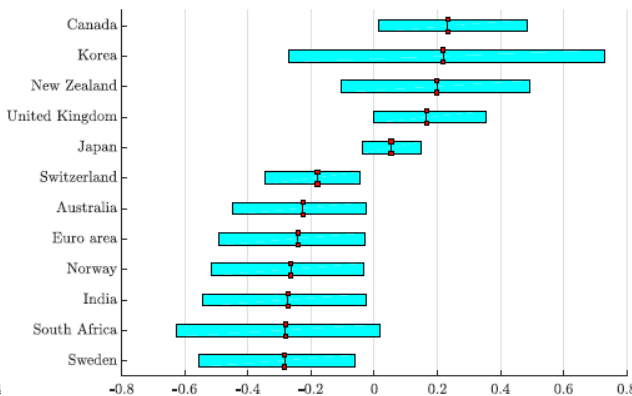
(c) Short-term interest rate



(d) Real equity prices



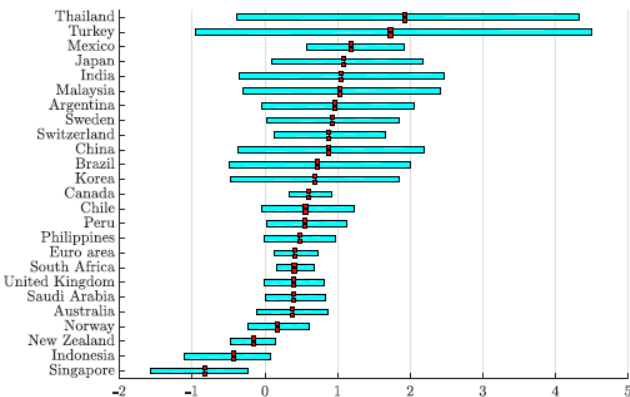
(e) NEER



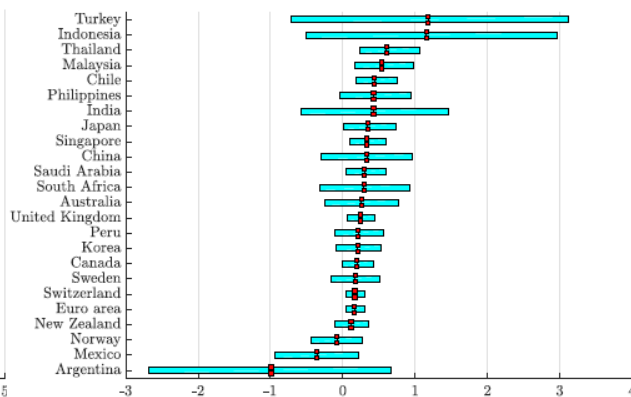
(f) Term spread

Note: maximum absolute responses and associated 68% bands

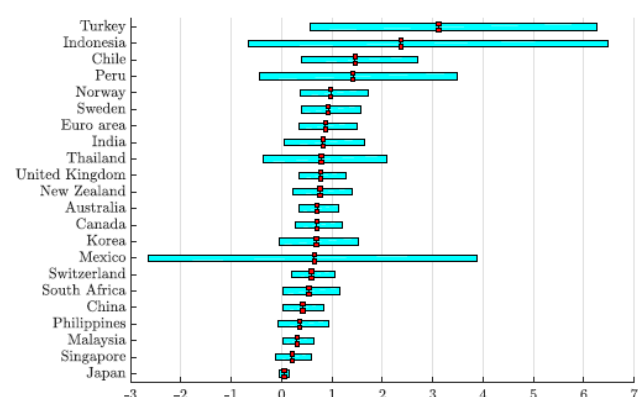
Compression in US term spread: country-level spillovers



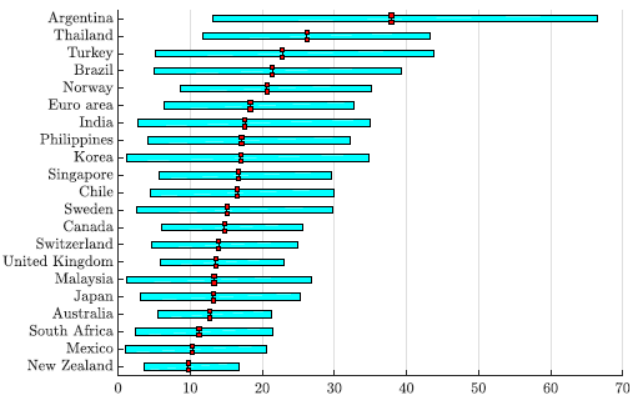
(a) Output growth



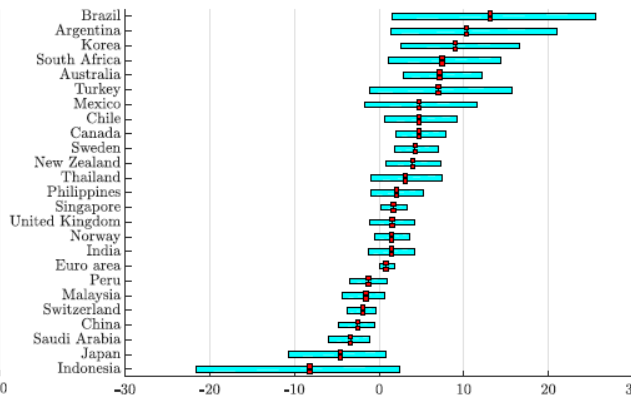
(b) Inflation



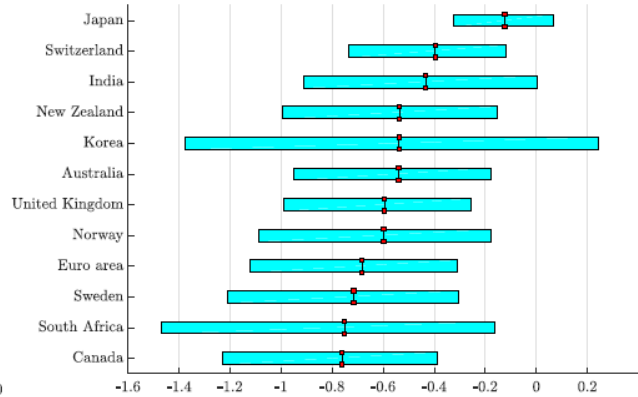
(c) Short-term interest rate



(d) Real equity prices



(e) NEER



(f) Term spread

Note: maximum absolute responses and associated 68% bands

Comparing spillovers from UMP and CMP shocks

