Footprints of global shocks in emerging markets: Sources of exposure and international spillovers

27 November 2024

GEAR Quarterly Lectures
University of Reading

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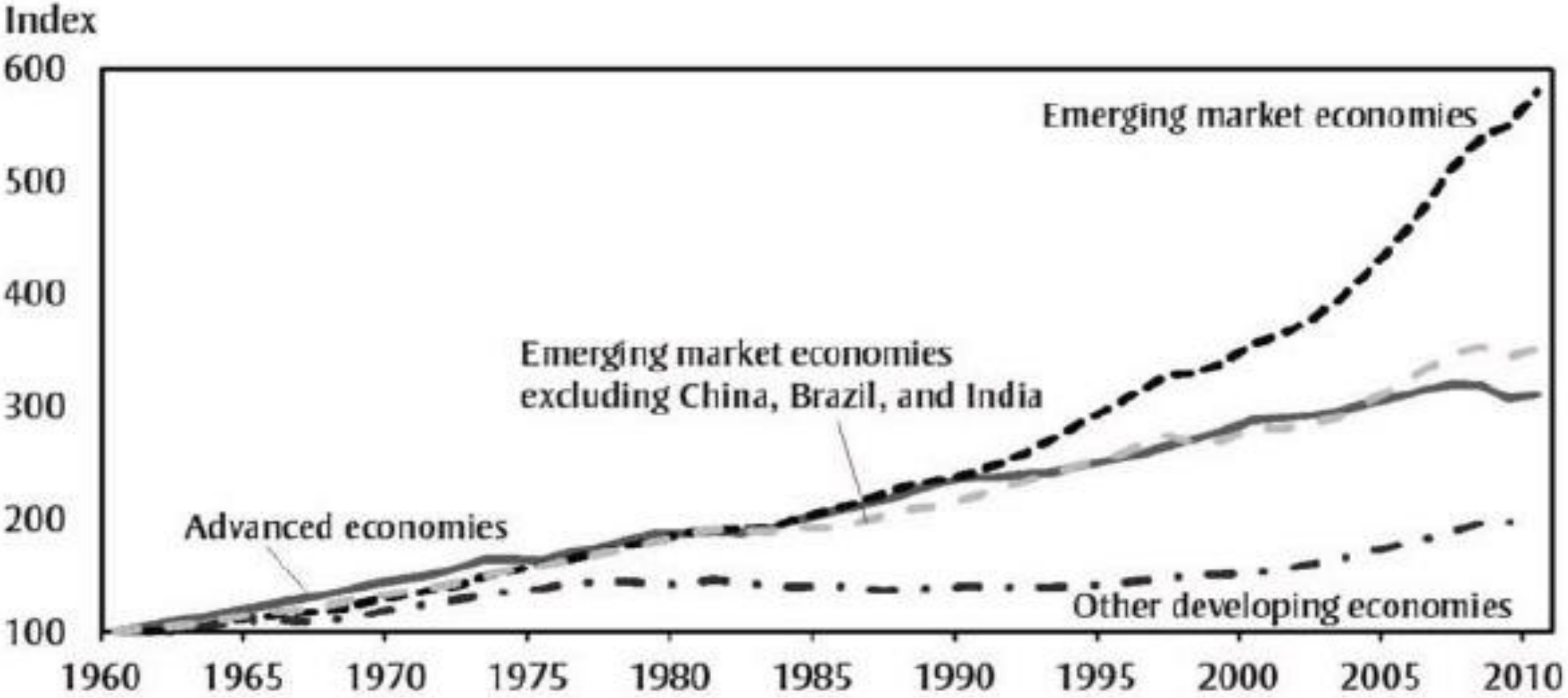
King's College London

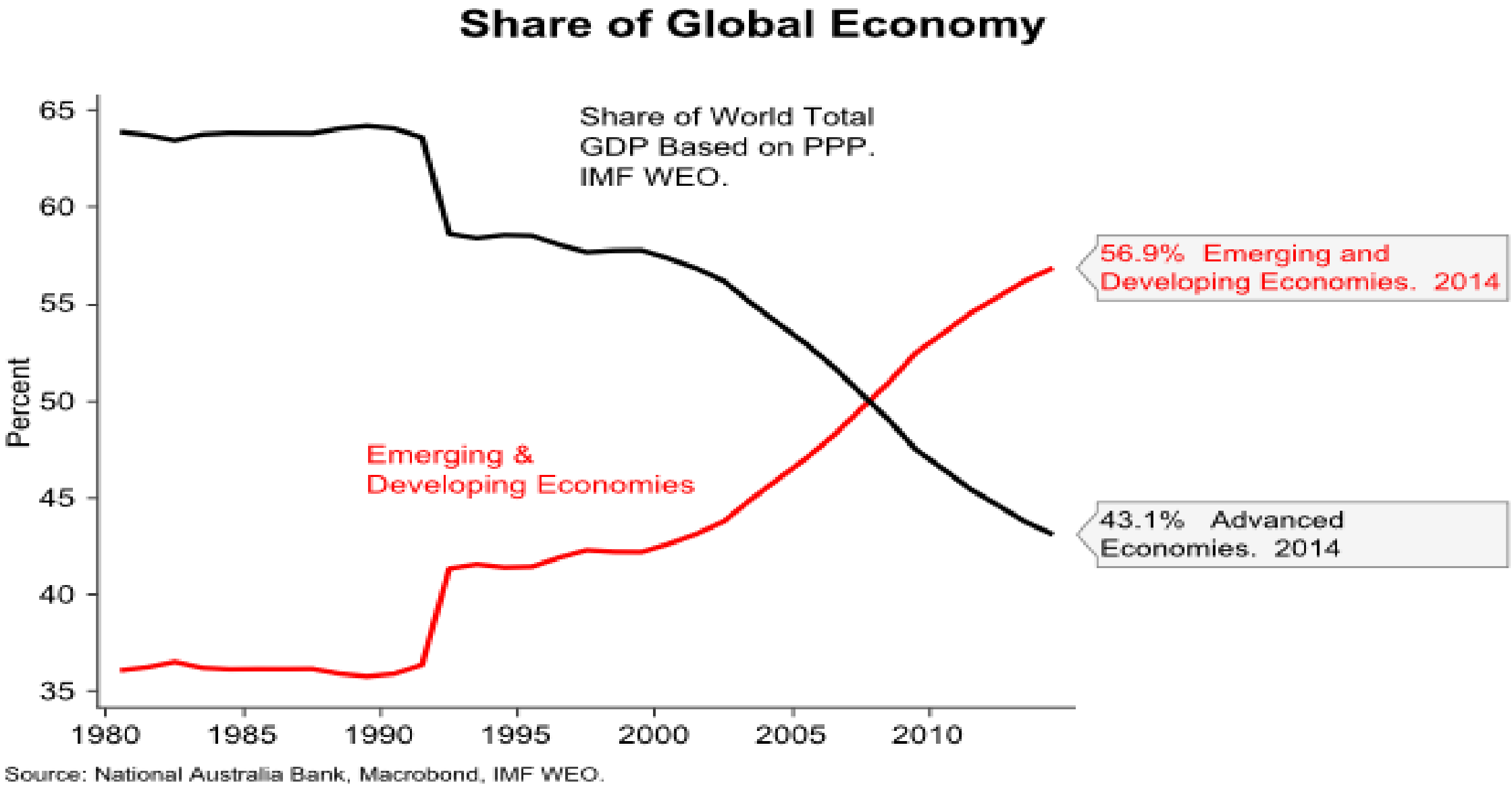
Plan of the talk

- Emerging markets and the global economy
- Financial globalization
- Major global shocks- 2008-2024
- Channels of transmission
  - International trade
    - Supply chains
  - International finance
    - Capital flows
      - Exchange rate effect
        1. exchange rate pass-through
        2. pricing of exports
        3. foreign currency borrowing (original sin)
- How do global policy shocks impact emerging economies?

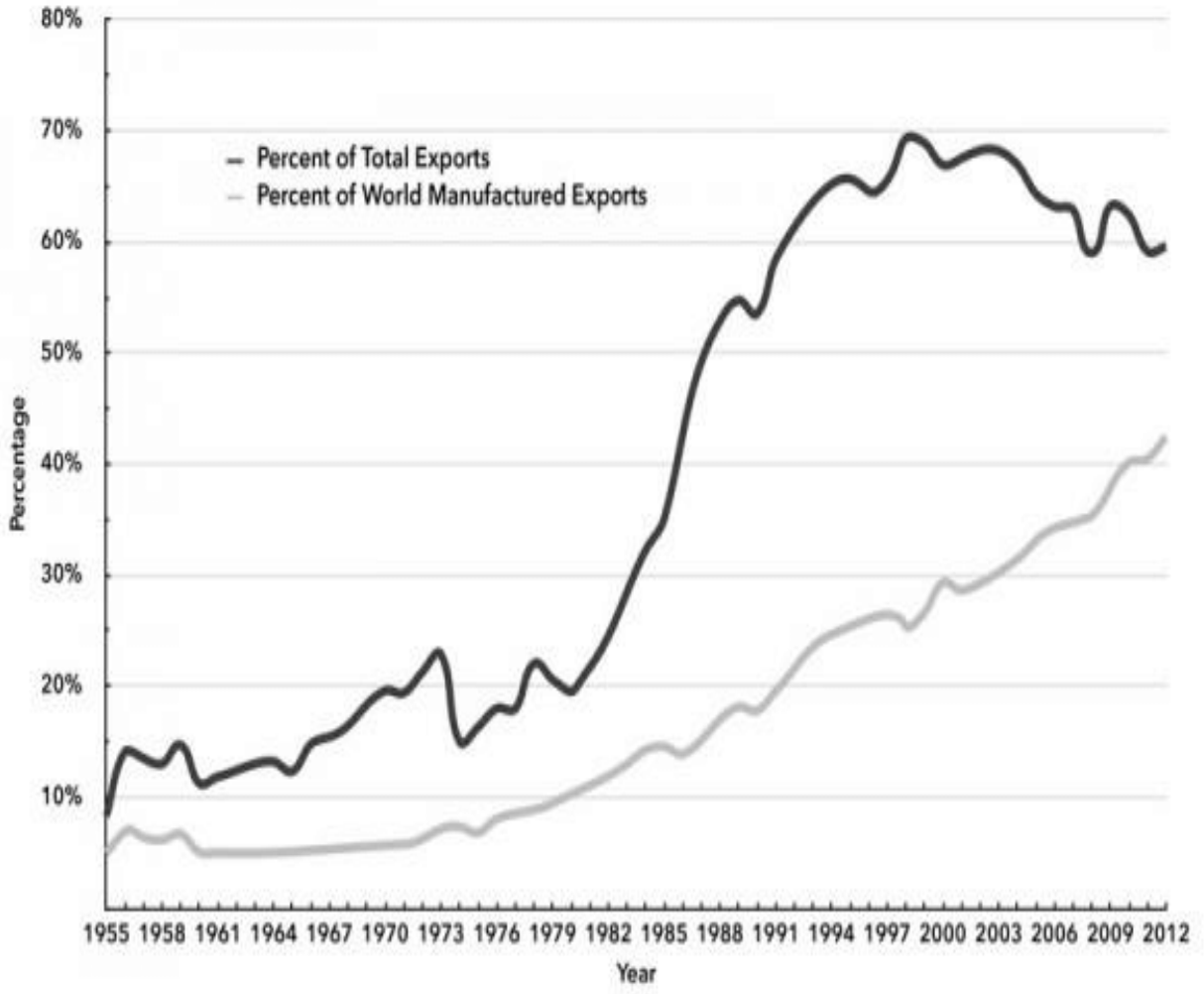
Emerging markets and economic growth

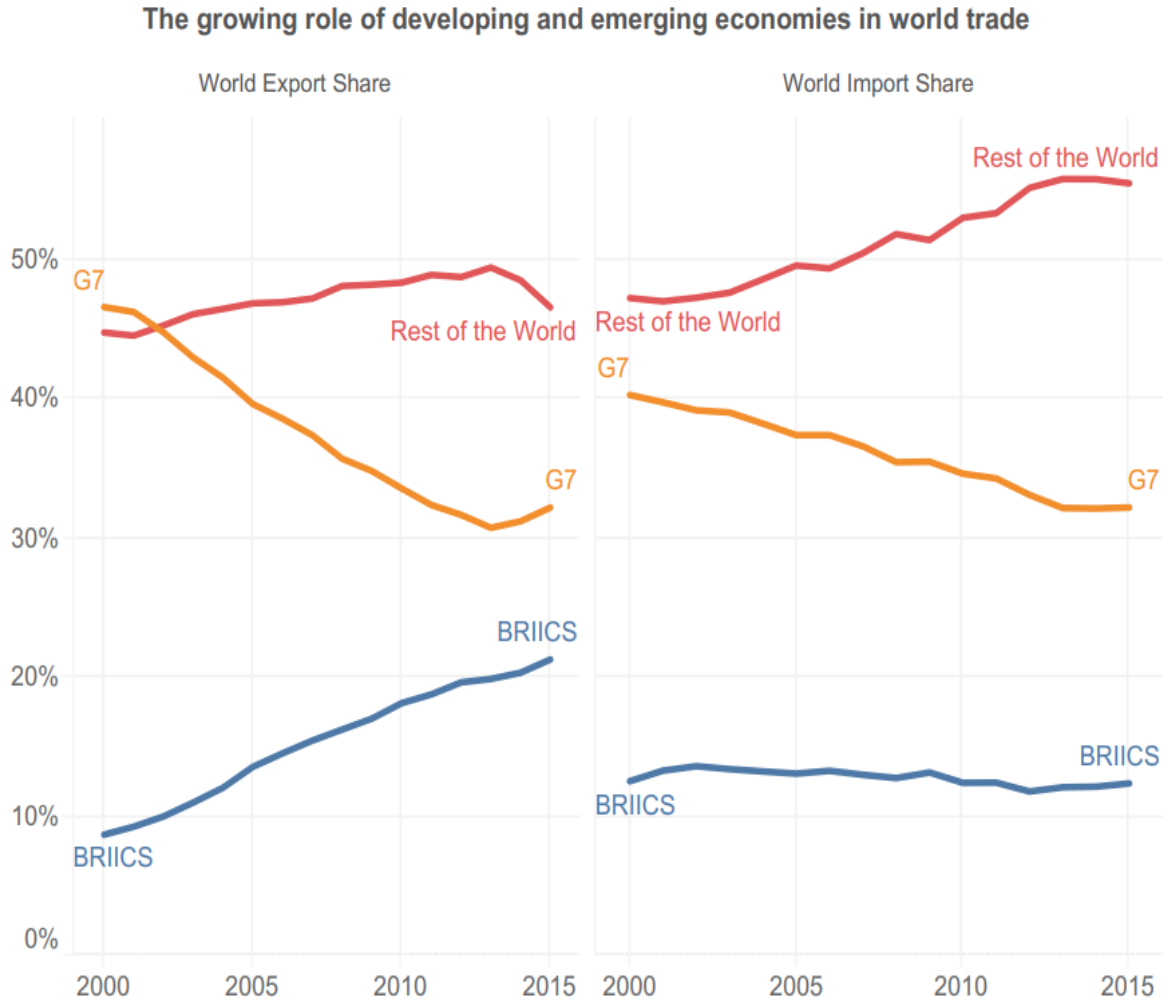


Consequently, as a share of the global economy…

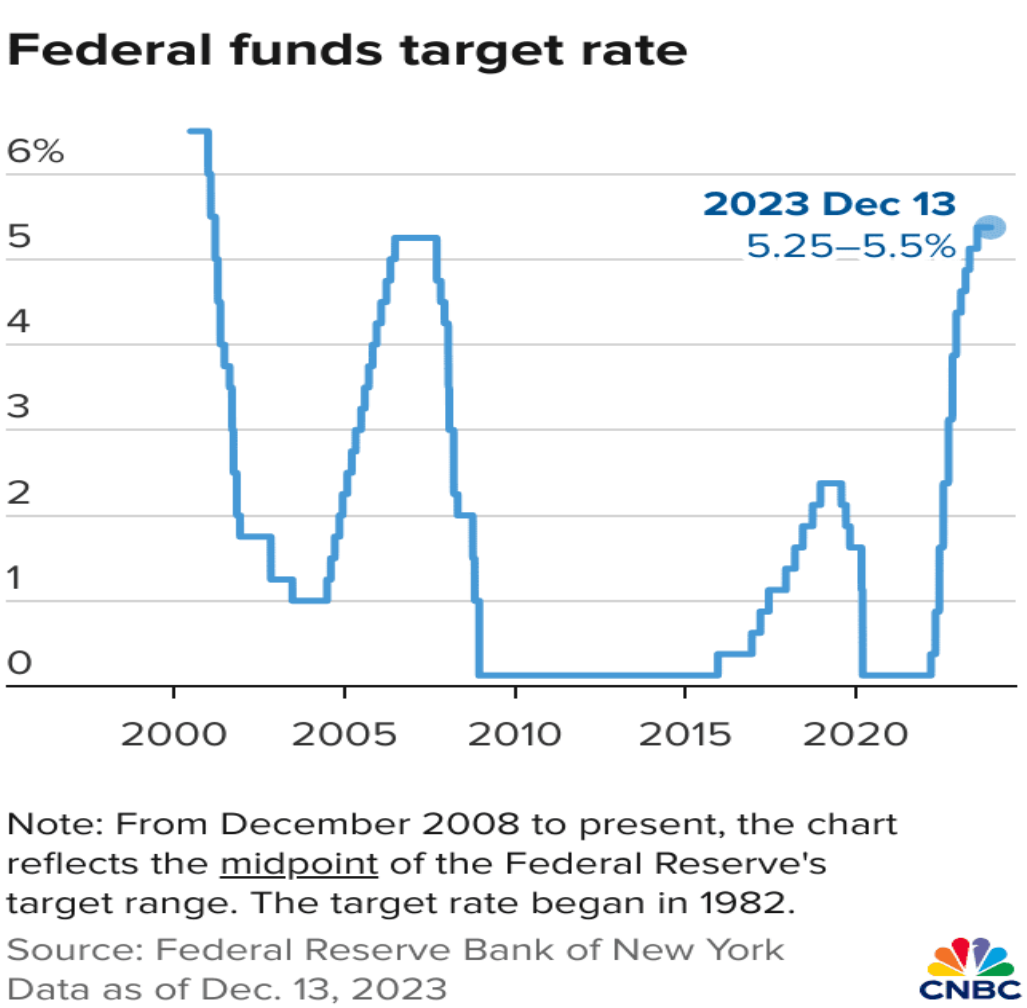


And, as a share of global trade…





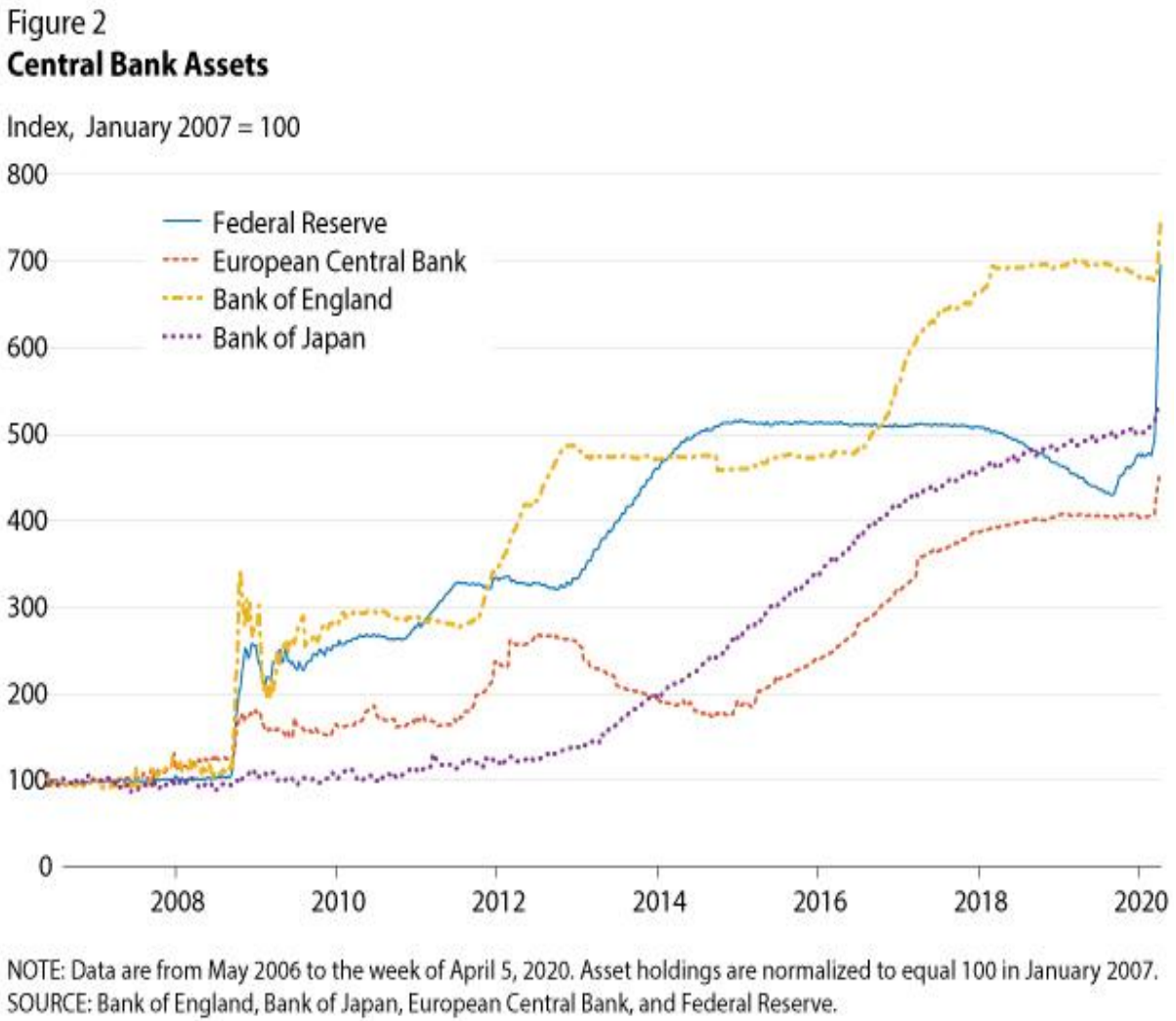
Major changes in US monetary policy – Conventional and Unconventional



Note: From December 2008 to present, the chart reflects the midpoint of the Federal Reserve's target range. The target rate began in 1982.

Source: Federal Reserve Bank of New York
Data as of Dec. 13, 2023

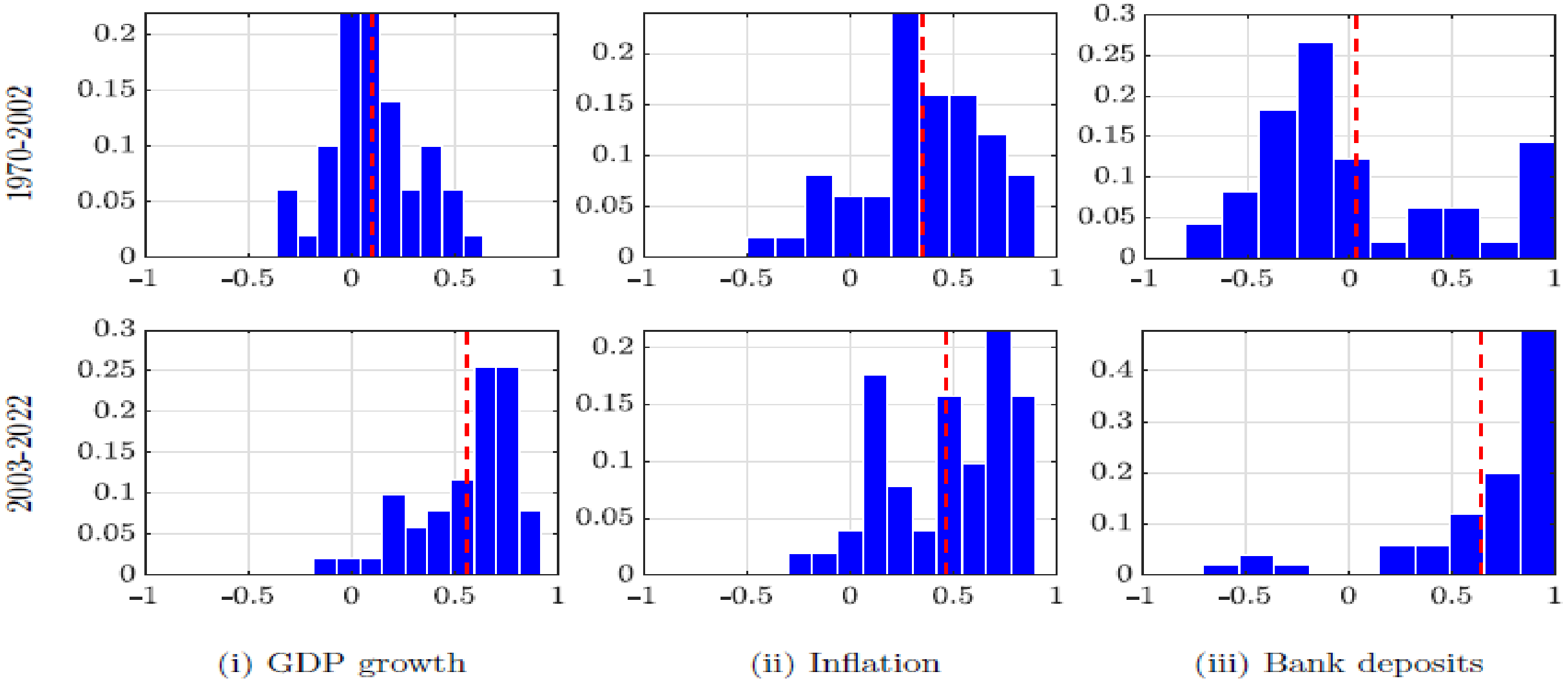
CNBC



NOTE: Data are from May 2006 to the week of April 5, 2020. Asset holdings are normalized to equal 100 in January 2007.
SOURCE: Bank of England, Bank of Japan, European Central Bank, and Federal Reserve.

Intensification of globalization

Figure 1: Distribution of cross-country correlations of GDP growth, inflation, and bank deposits.

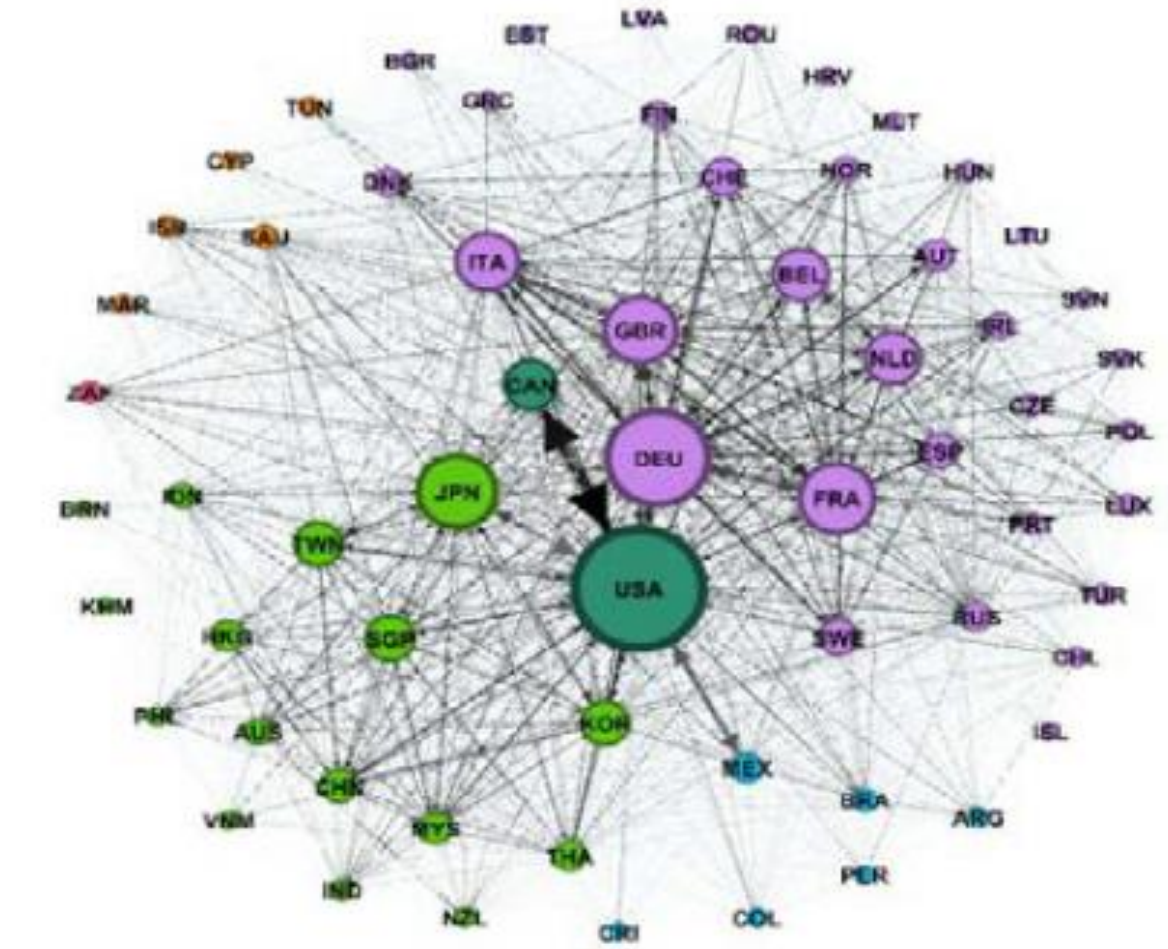


Source: World Development Indicators, Global Financial Development.

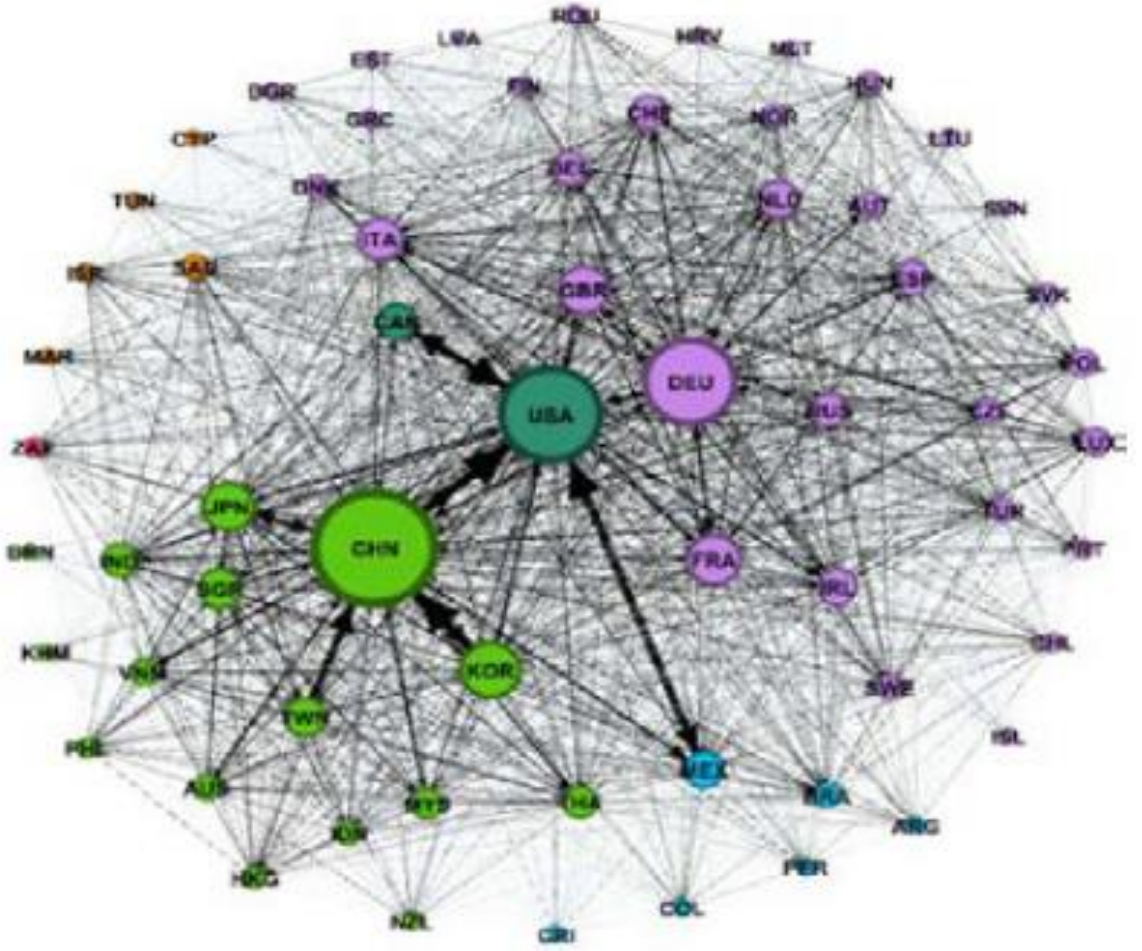
Transformation of global trade

GVC networks

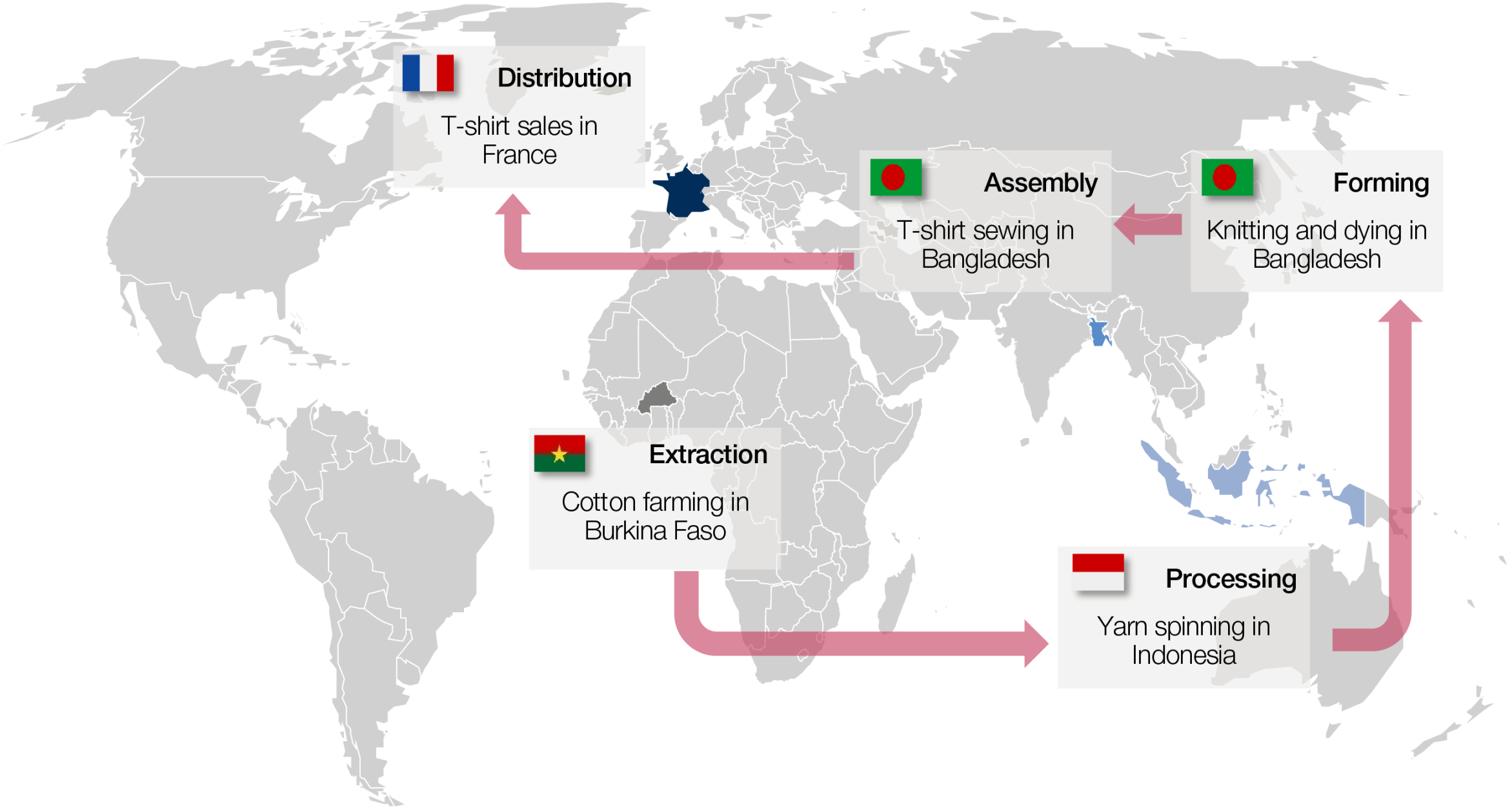
a) 1995



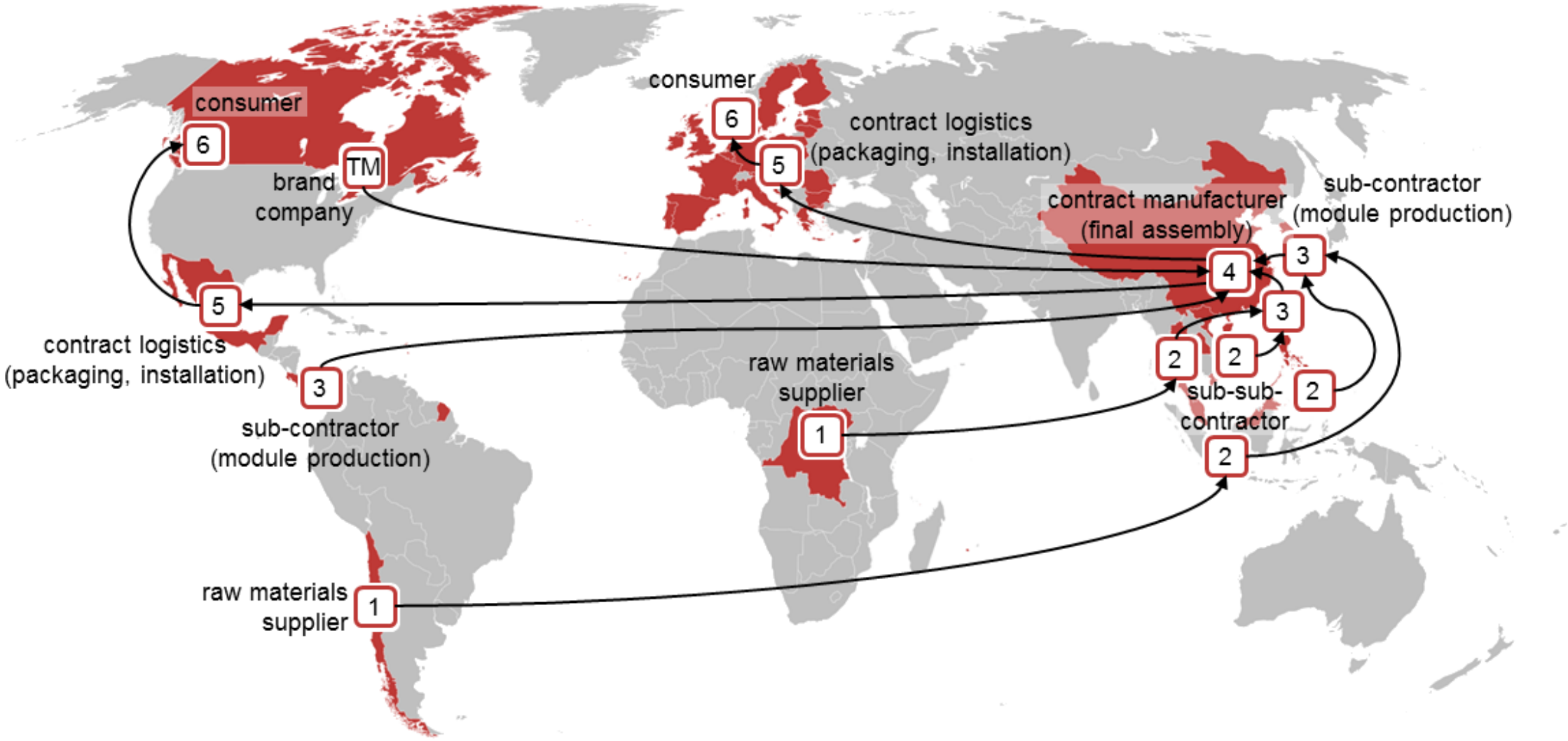
b) 2015



Supply chains – example one



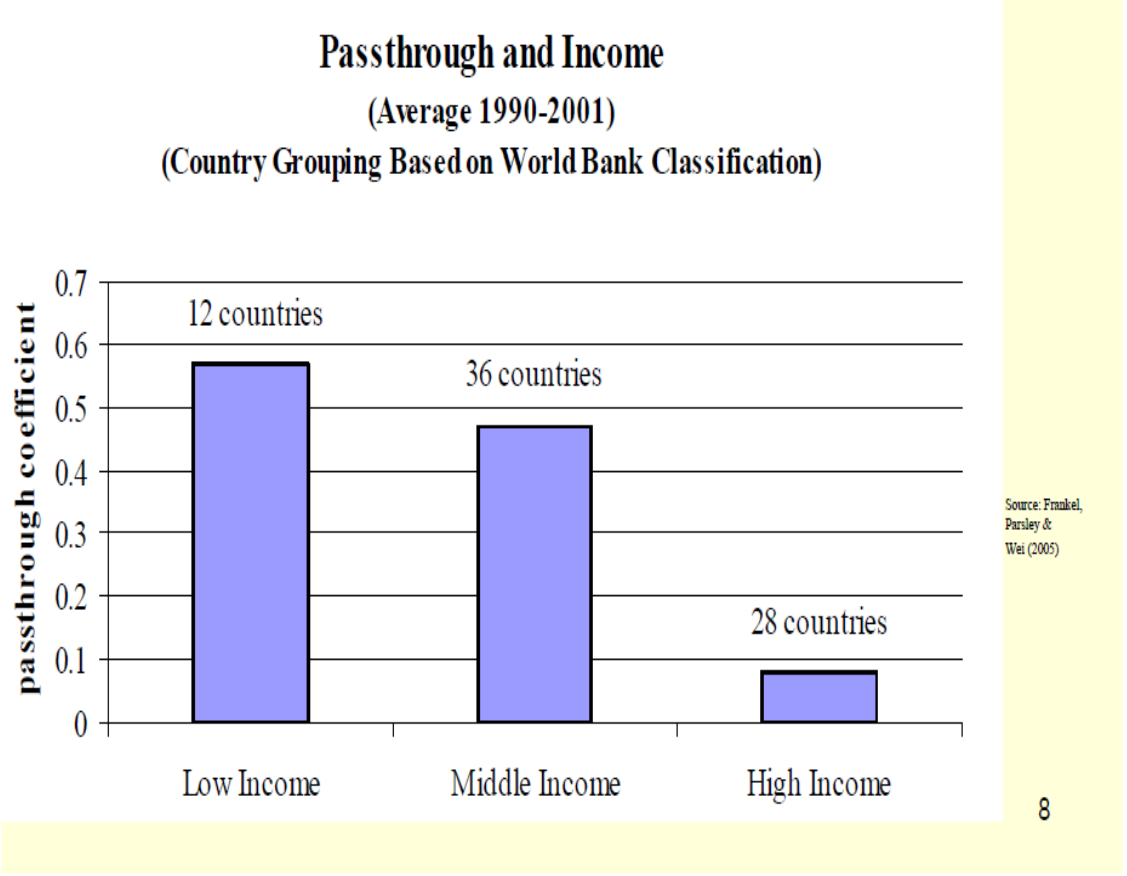
Supply chains - example 2

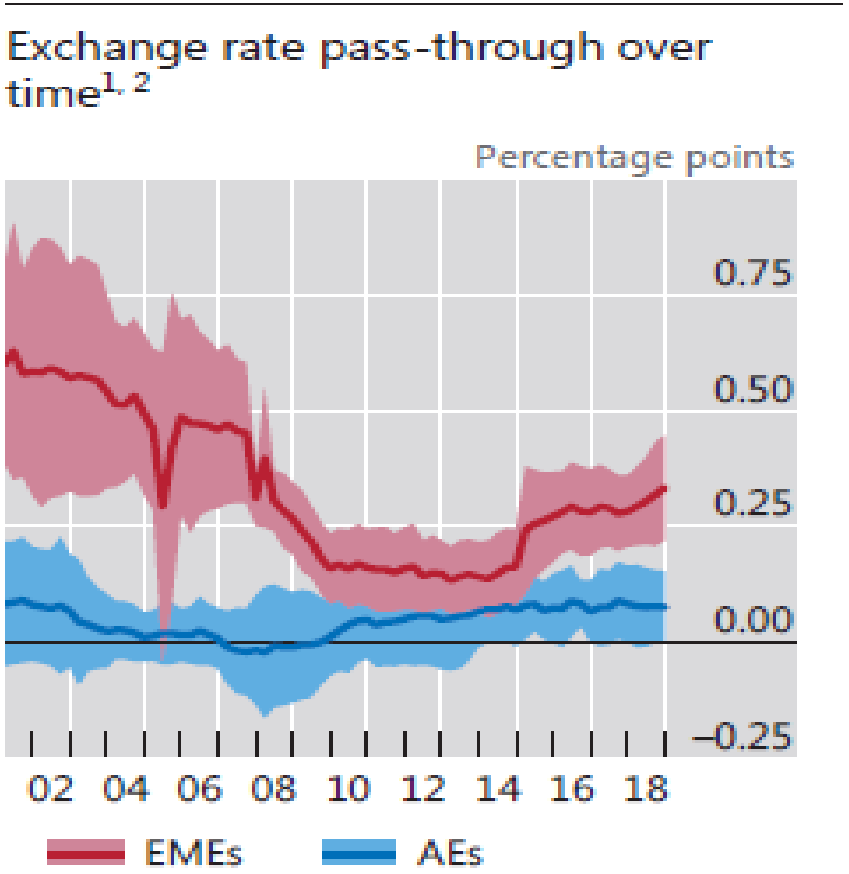


Source: Andreas Wieland, scmresearch.org

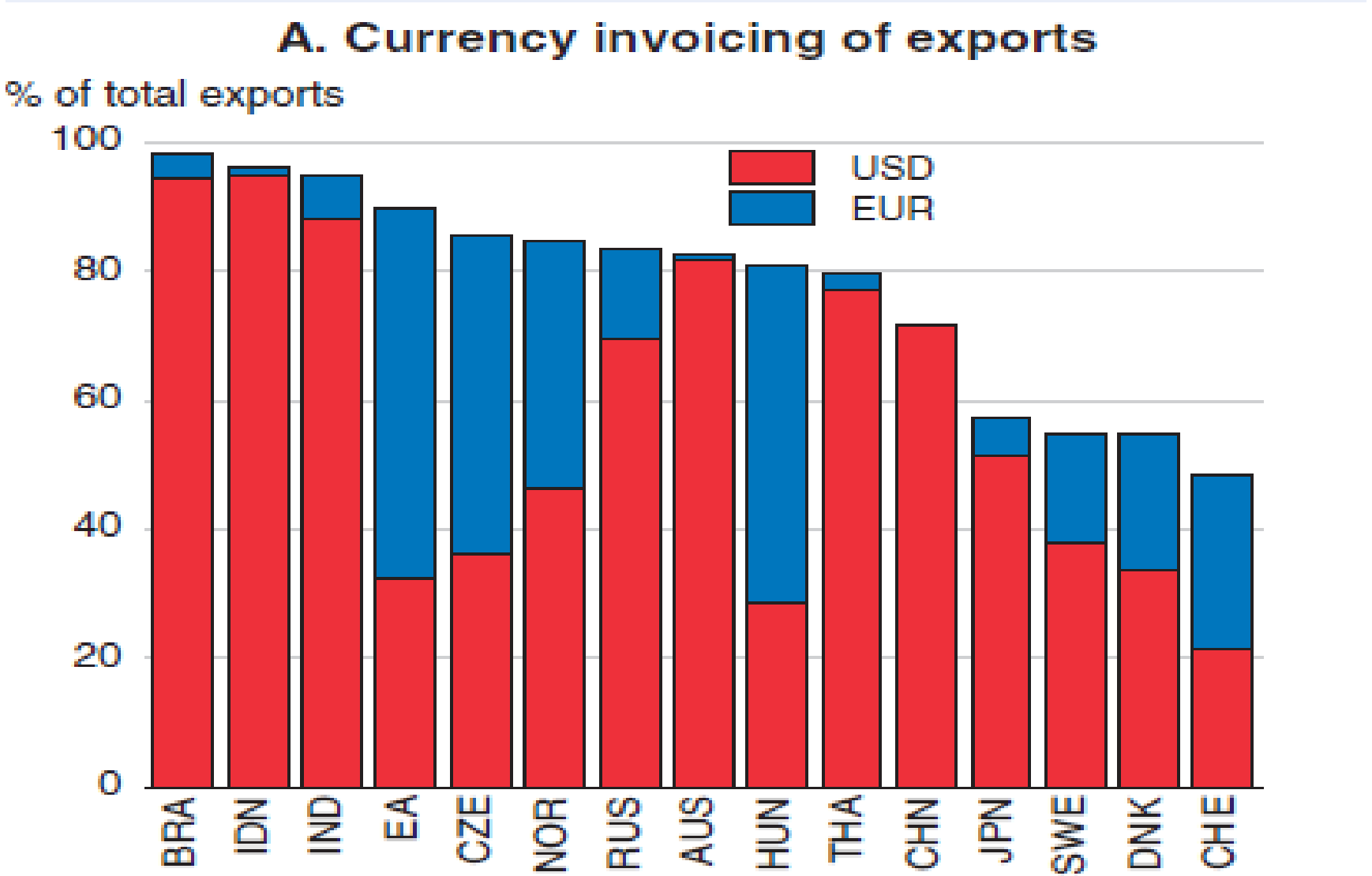
Exchange rate effect (1)

Exchange rate pass-through



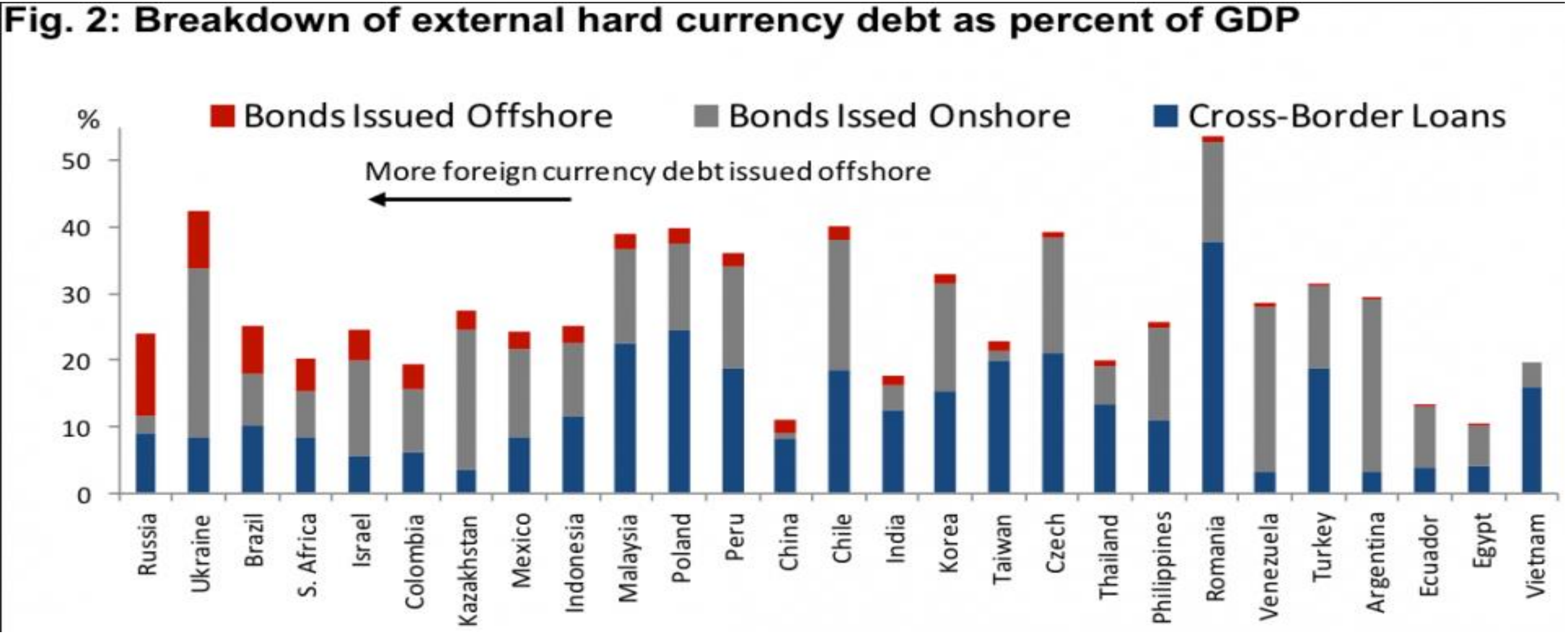


Exchange rate effect (2)
Pricing of exports

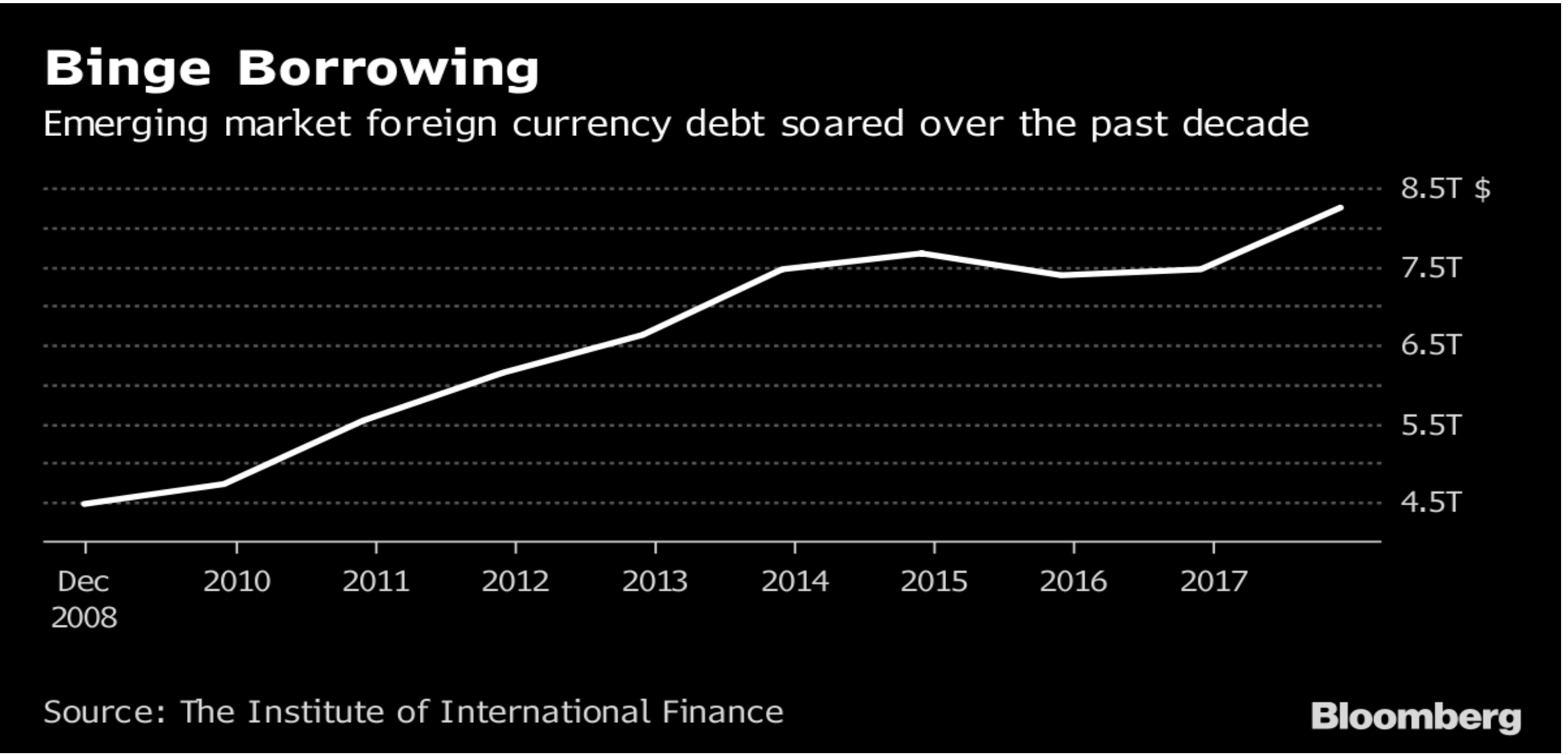


Exchange rate effect (3)
Foreign currency borrowing

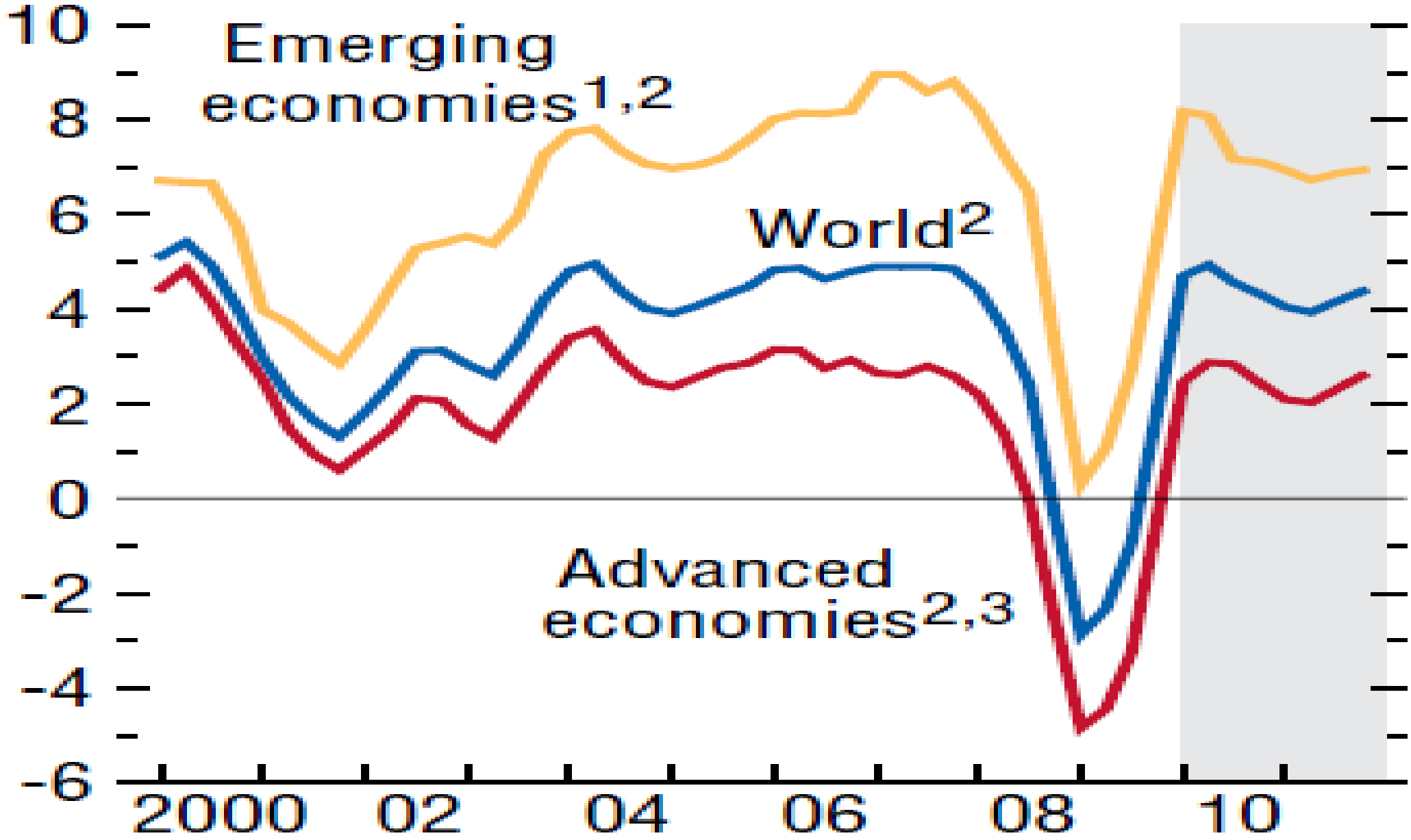
Fig. 2: Breakdown of external hard currency debt as percent of GDP



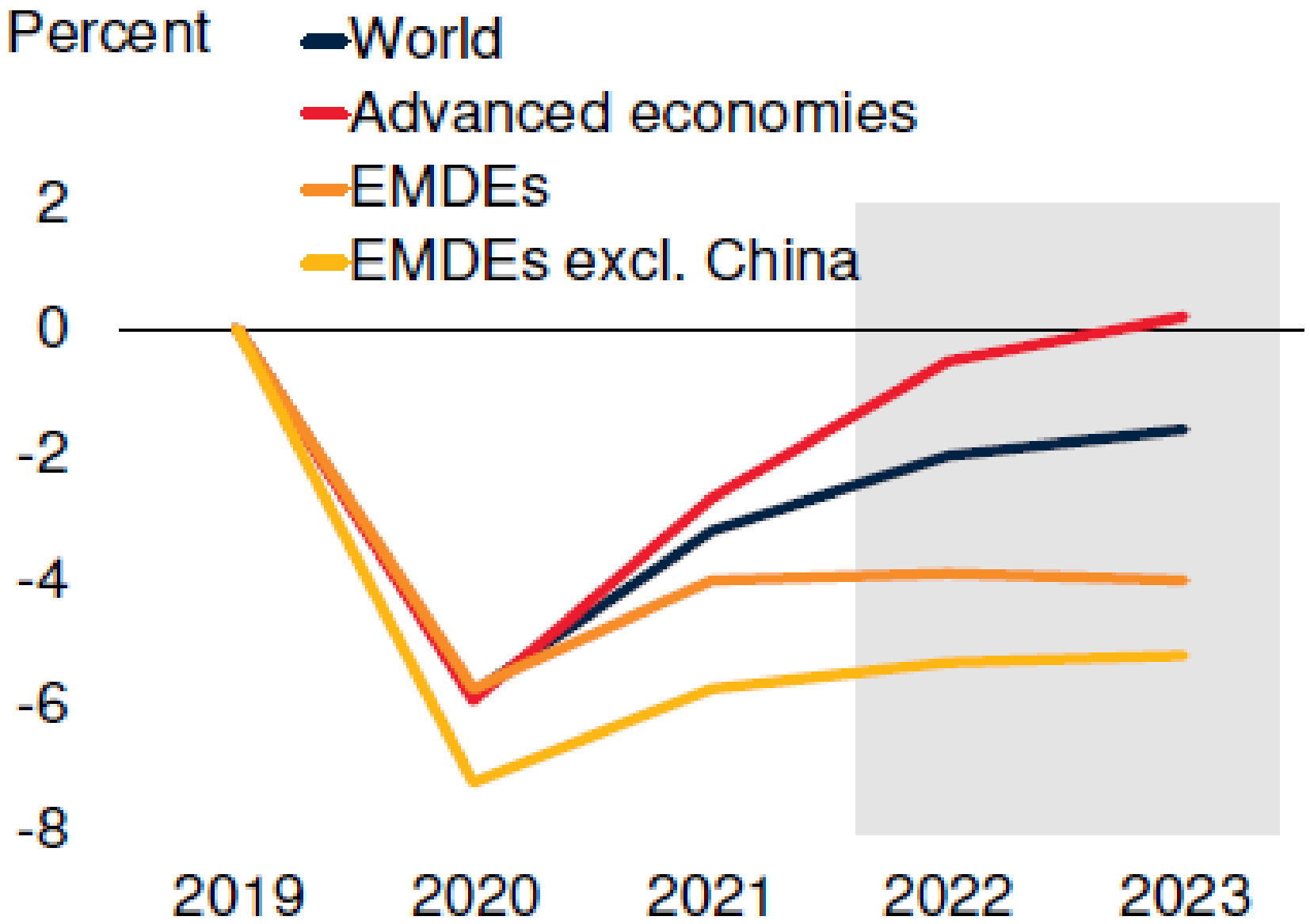
Cont. Foreign currency borrowing



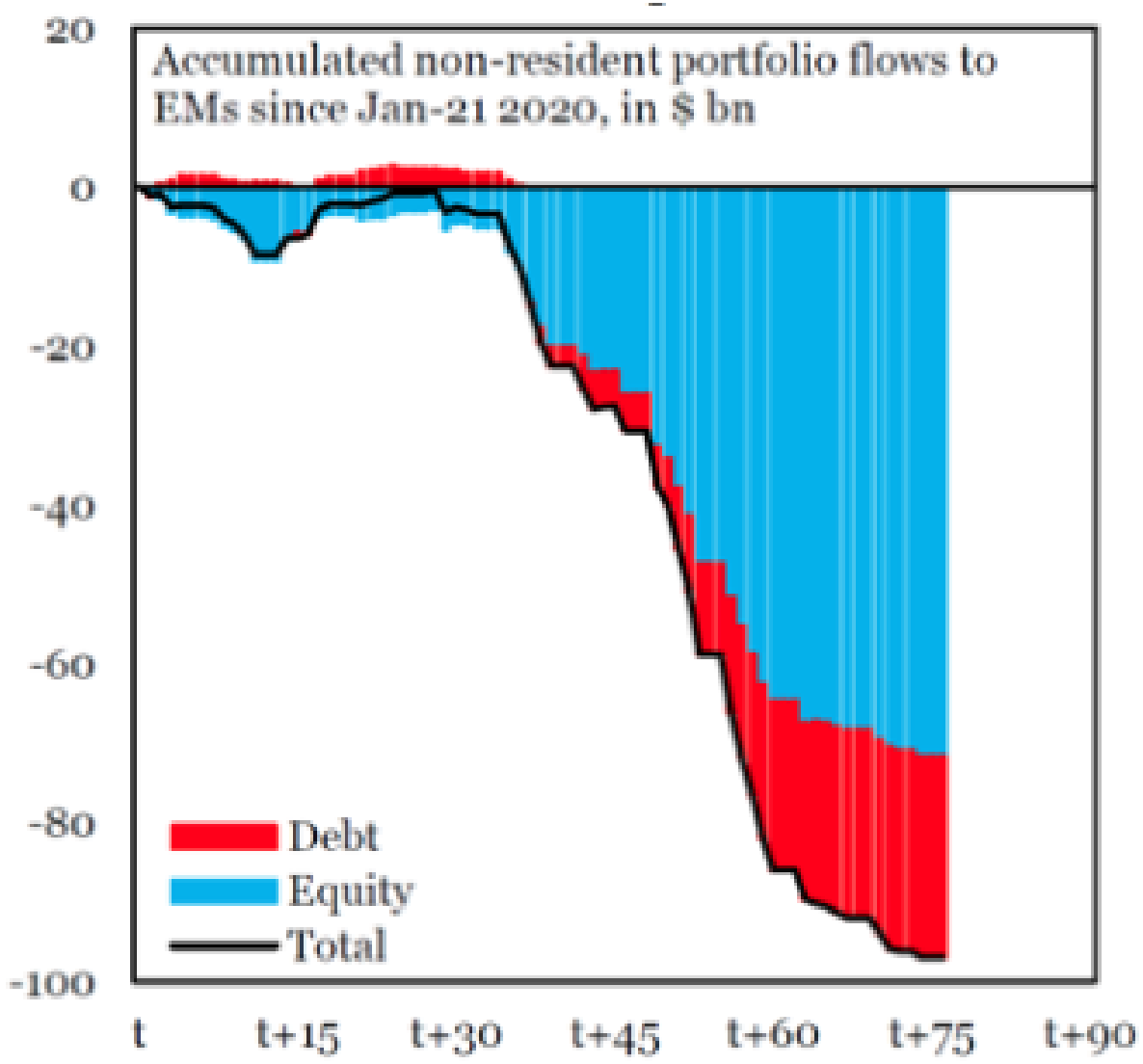
Three major shocks since 2008 (1)- 2008-09 GFC

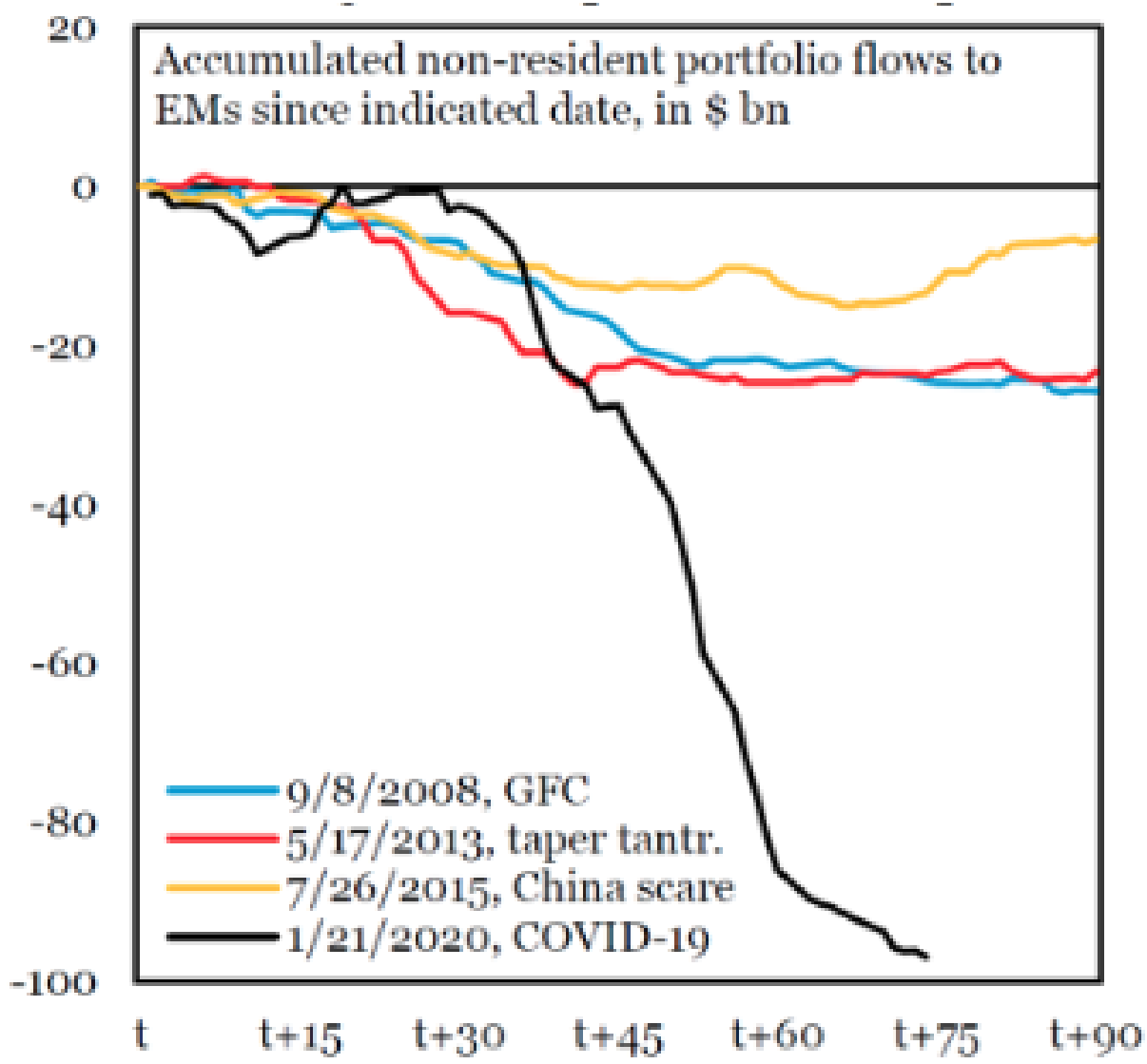


Three major shocks since 2008 (2)
Covid-19

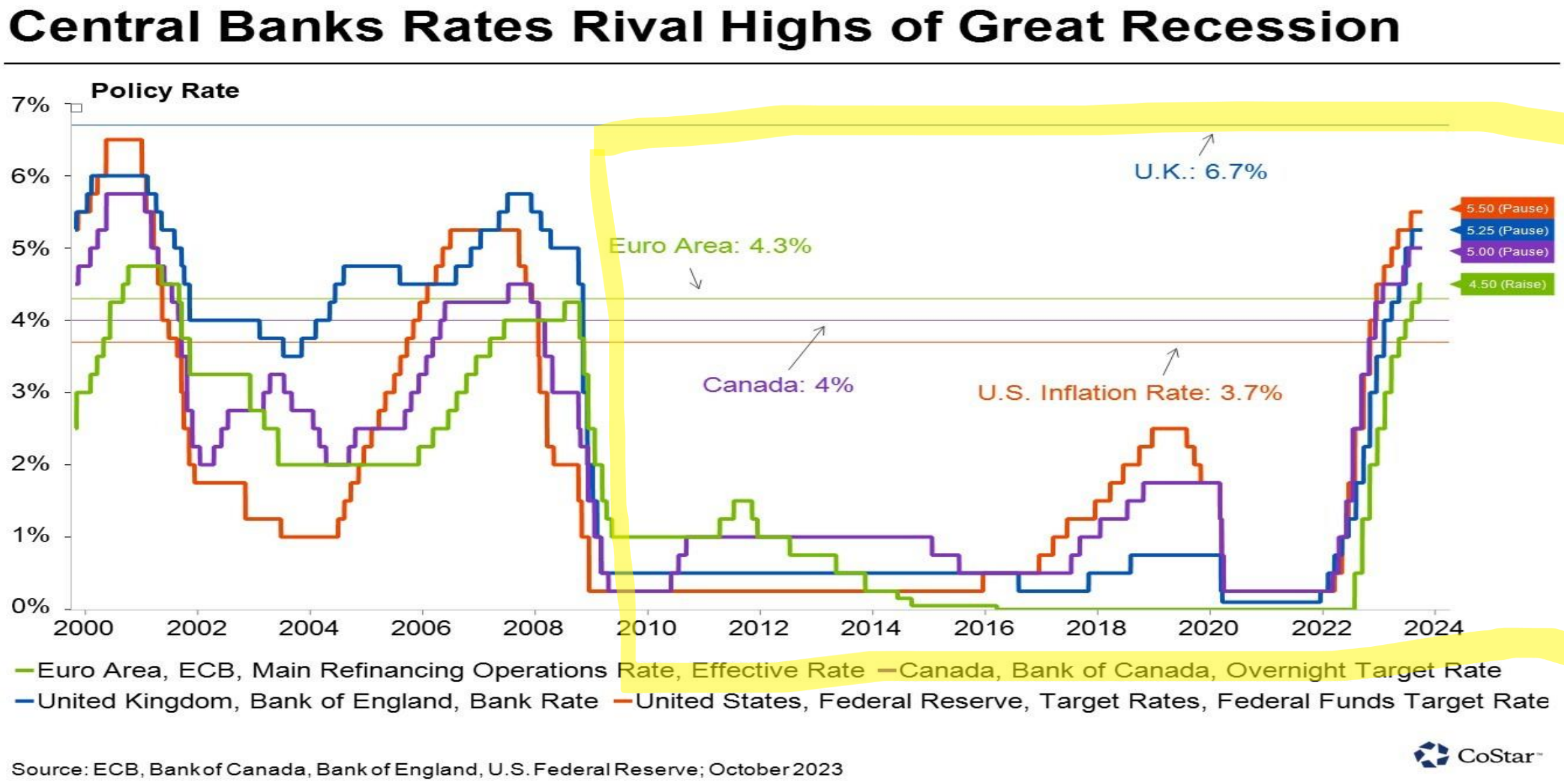


Covid-19 crisis and EMs

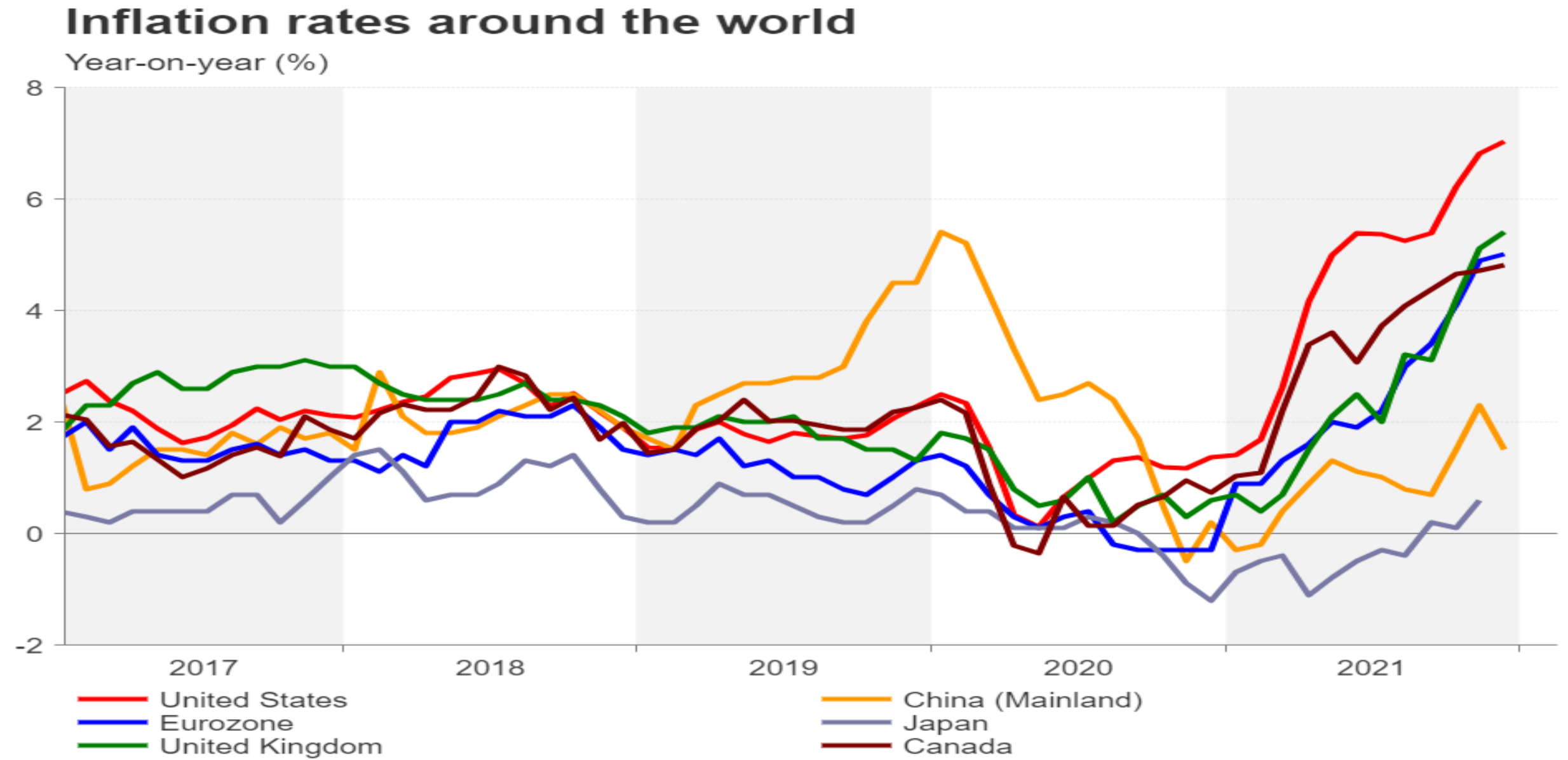




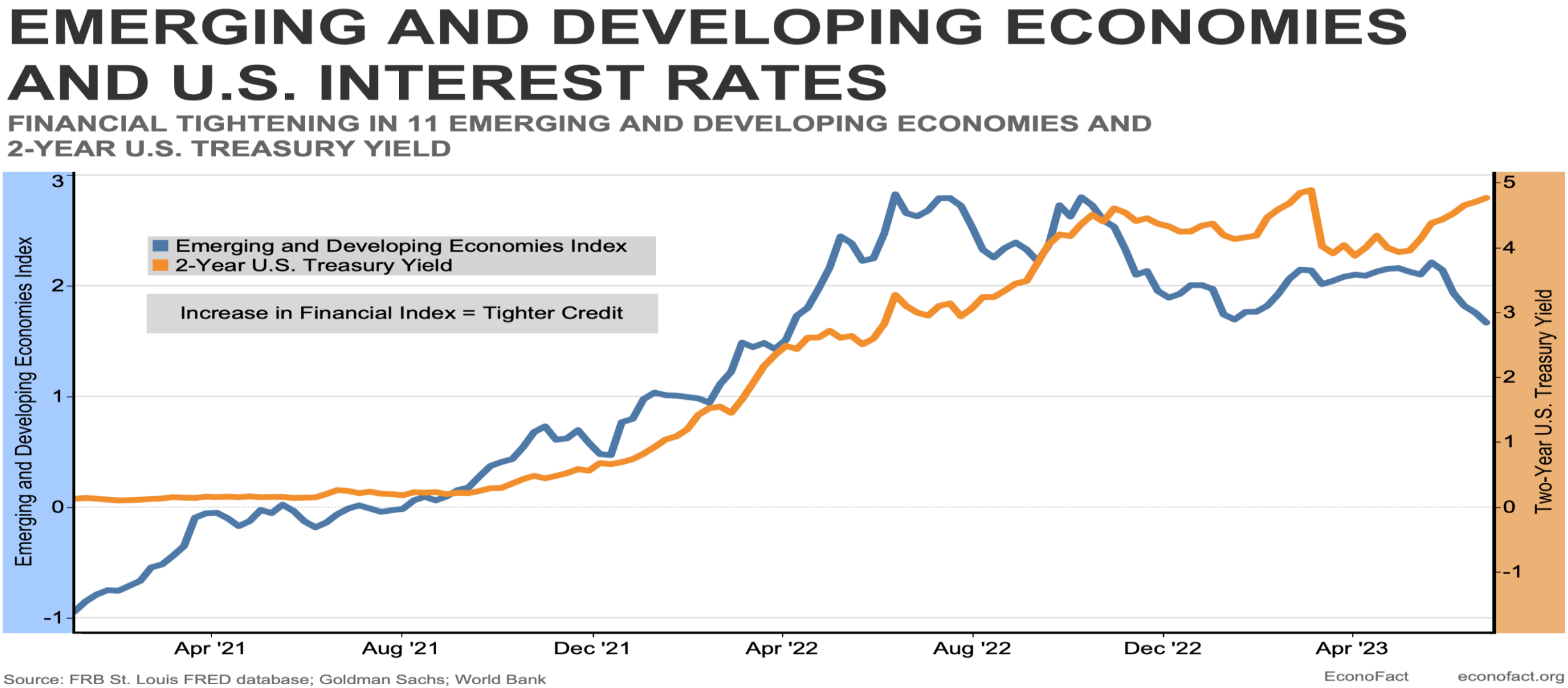
The global financial squeeze – interest rate hikes



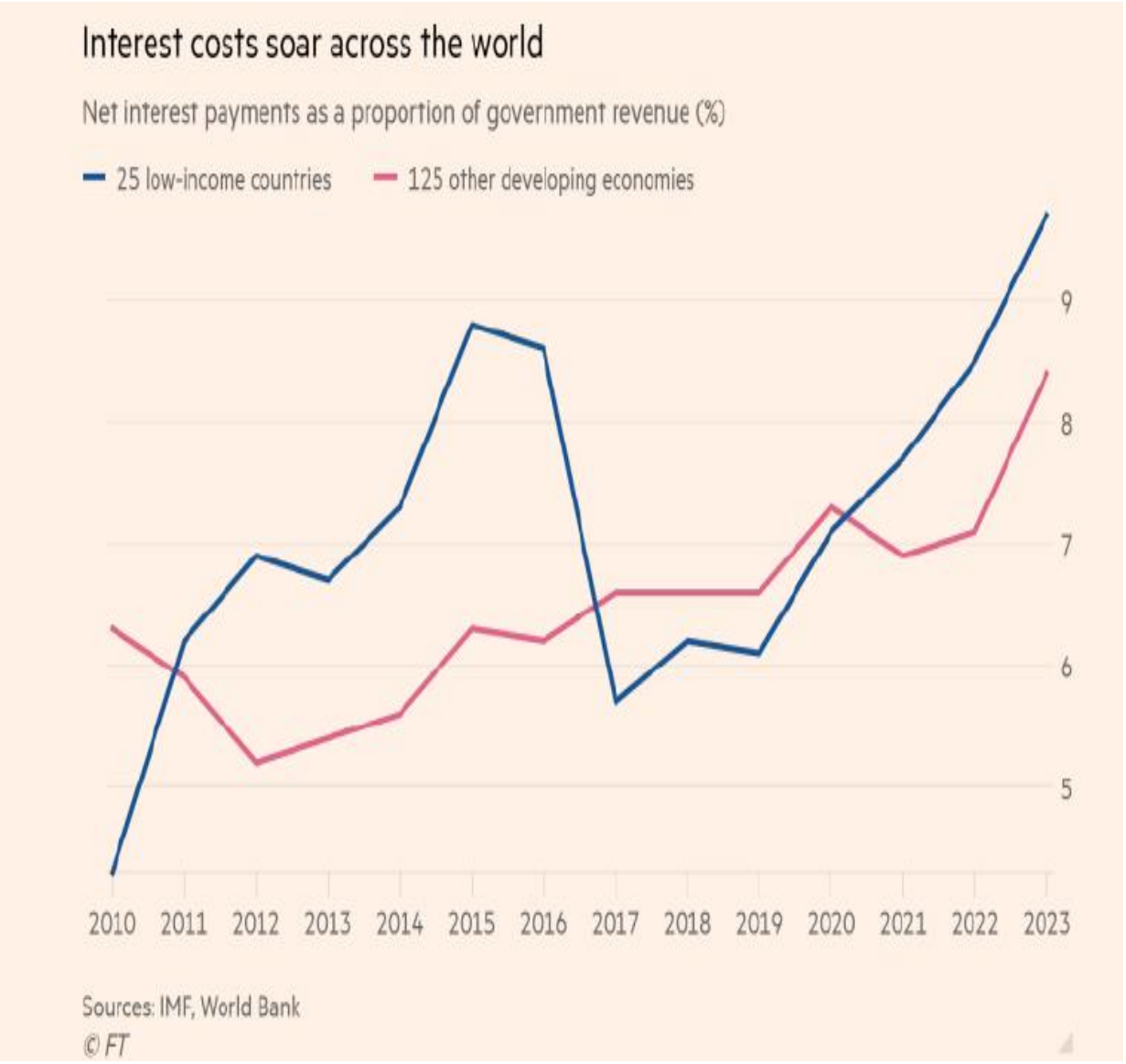
The global financial squeeze- record inflation

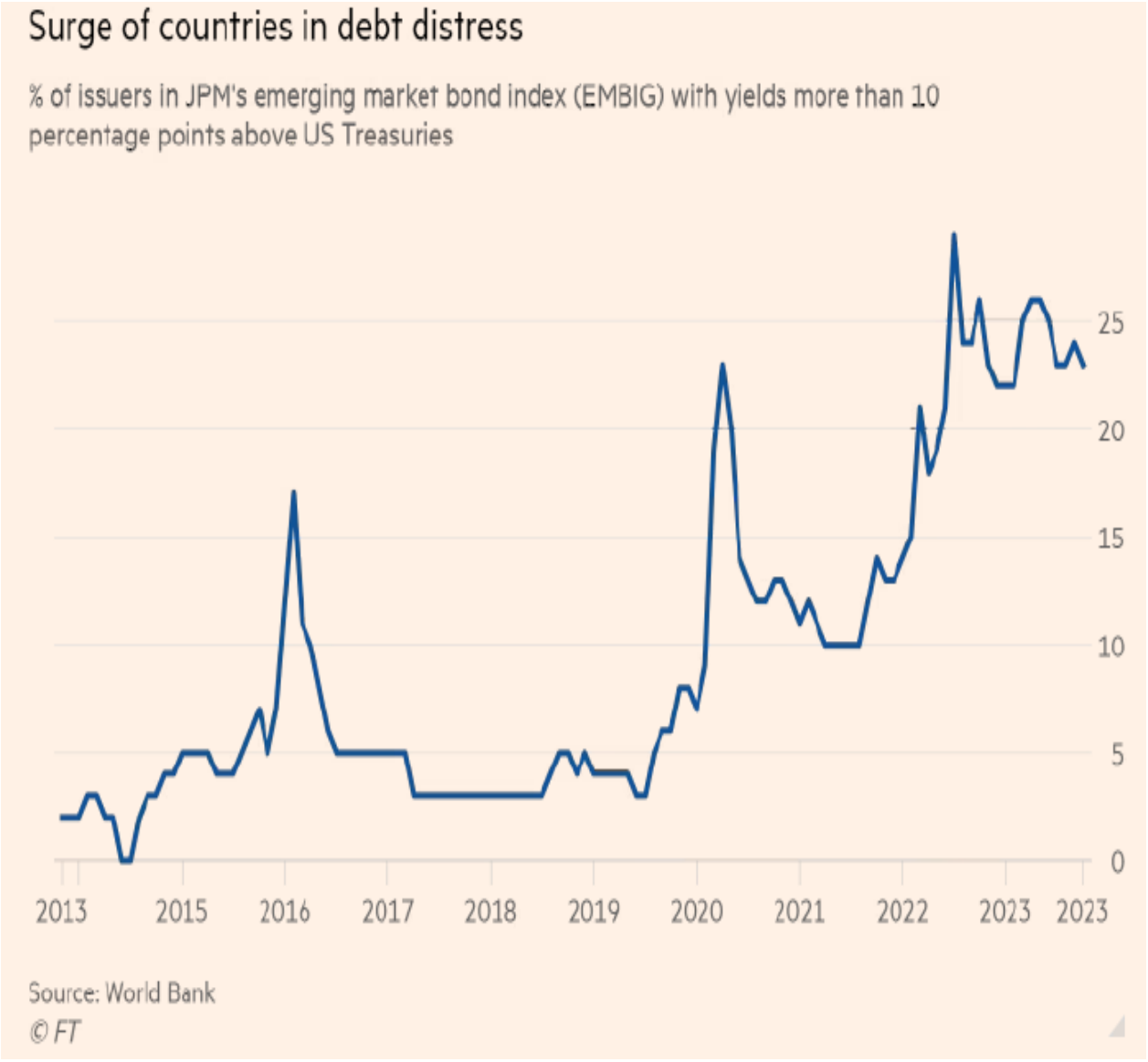


Three major shocks since 2008 (3)
Global financial squeeze



The global financial squeeze- soaring interest payments





Global shocks and emerging economies

- Global shocks are likely to be transmitted to emerging economies via
  - International trade including supply chains
  - International finance hence capital flows
- Formal analyses through DSGE models featuring;
    - trade and financial linkages.

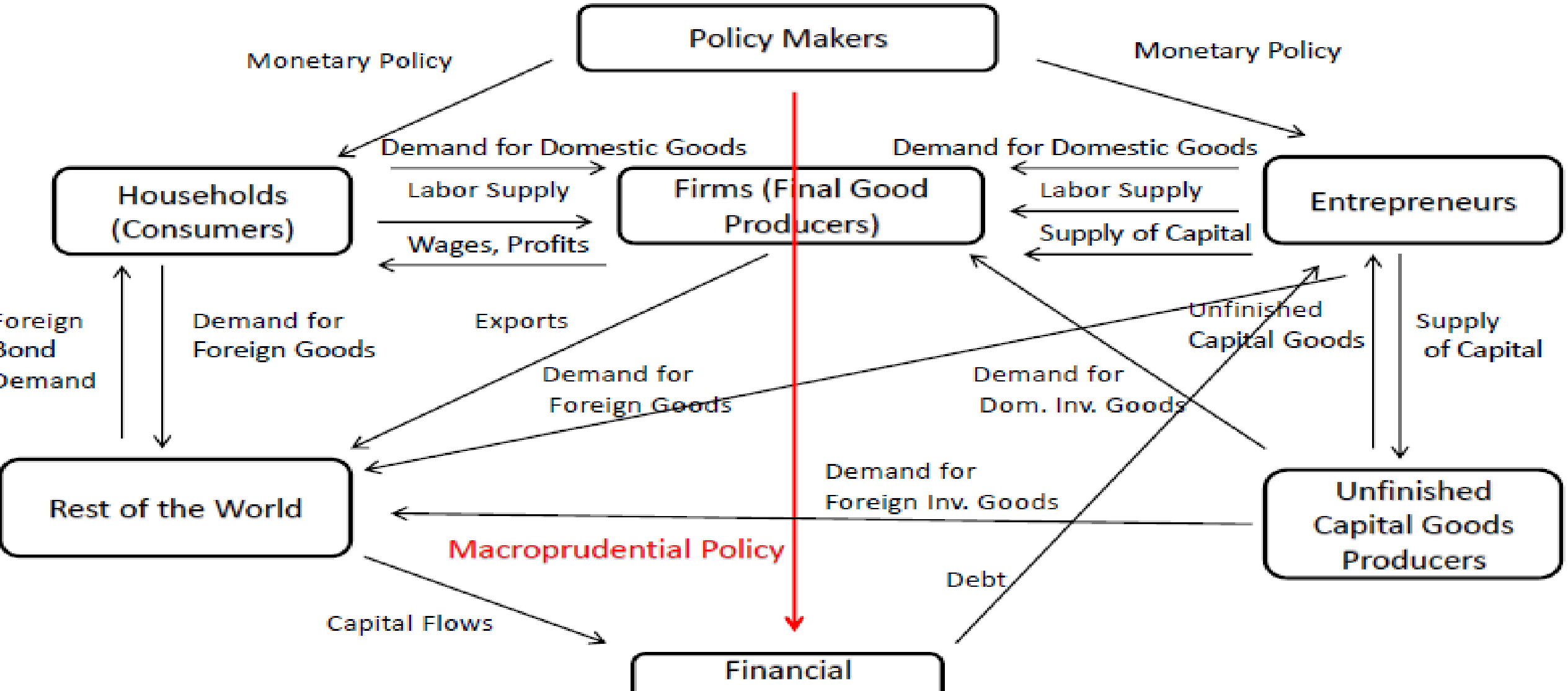
Existing literature

- *On financial frictions*
  - BGG (1999); Gertler&Kiyotaki (2010); Gertler & Karadi (2011); and Karadi&Nakov (2021), a very long list of others.

- *On supply chain networks*
  - Caliendo et al. (2019); Garcia-Lazaro et al.(2021)

- *On transmission channels*
  - Bruno & Shin(2015); Anaya et al. (2017); Dedola et al. (2017); Banerjee et al. (2016); Ozkan &Unsal (2017); Kolasa& Wesolowski (2020, 2021) and many others.

Ozkan-Unsal (2017)



Dynamics of a domestic crisis in an emerging economy

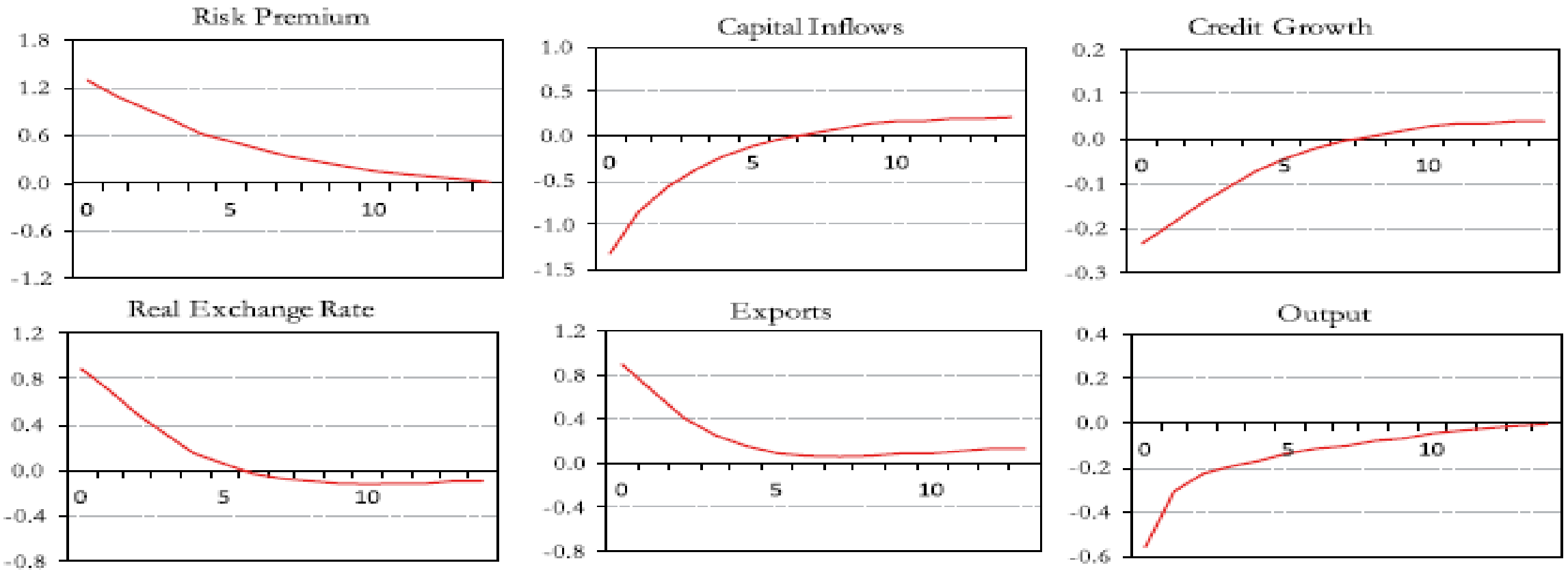


Fig. 1. Responses to a financial crisis (% deviations from the steady state)

Notes: The figures show the impact of a 1% shock to the risk premium. The variables are presented as log-deviations from the steady state, multiplied by 100 to have an interpretation of percentage deviations.

Dynamics of a domestic versus global financial crisis

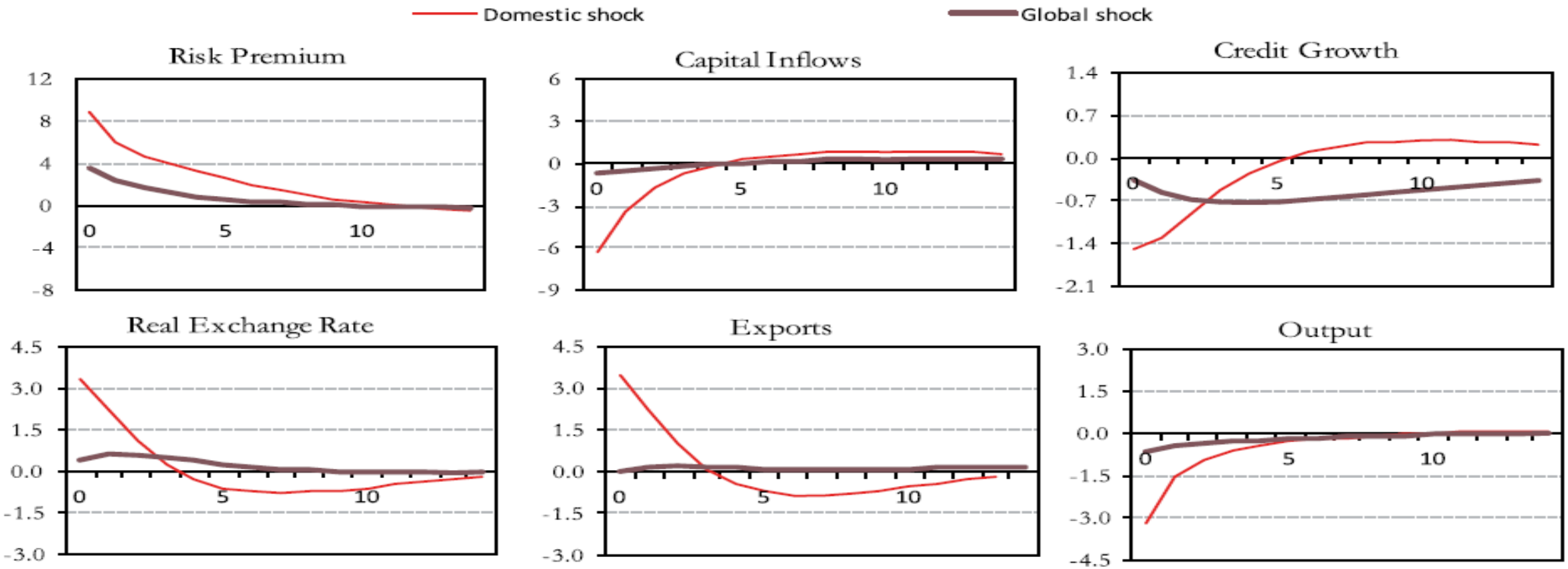


Fig. 3. Responses to a domestic and a global financial crisis (% deviations from the steady state)
Notes: The figures show the impact of a 1% and 0.3% shock to the perception of investors regarding domestic and foreign productivity, respectively. The variables are presented as log-deviations from the steady state, multiplied by 100 to have an interpretation of percentage deviations.

Dynamics of a global financial crisis : role of initial leverage

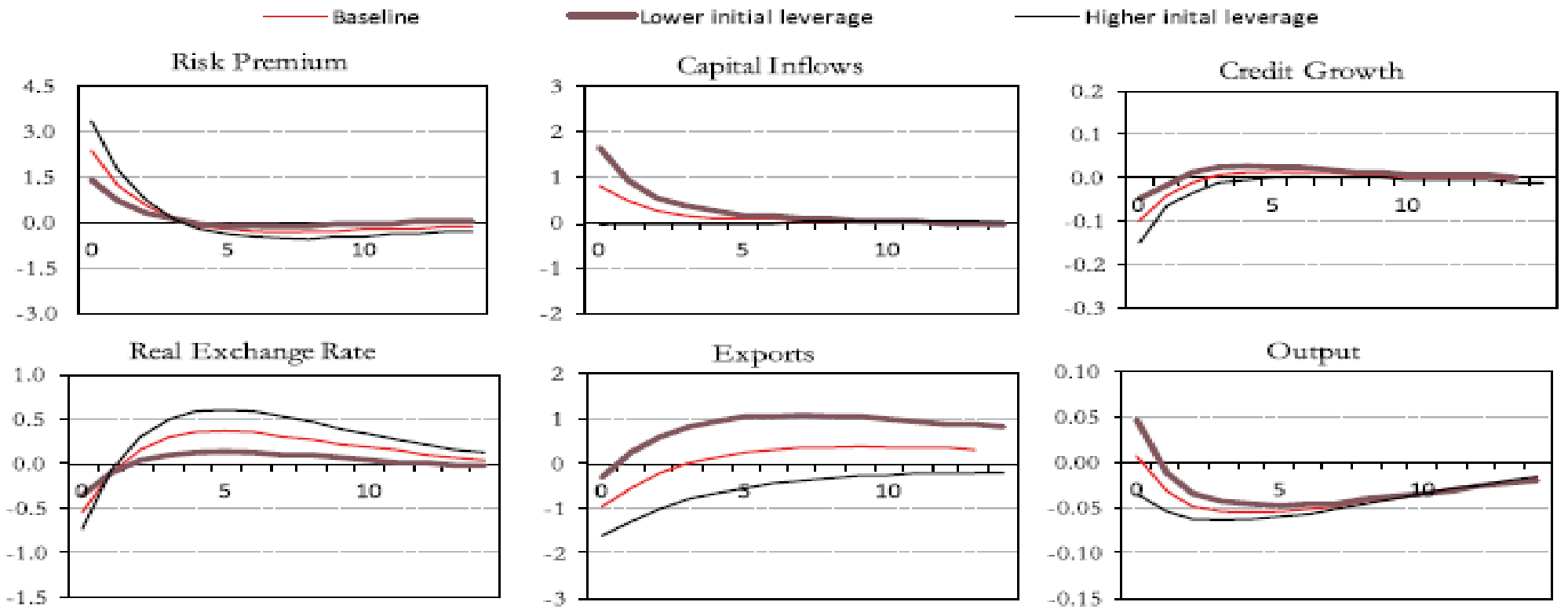
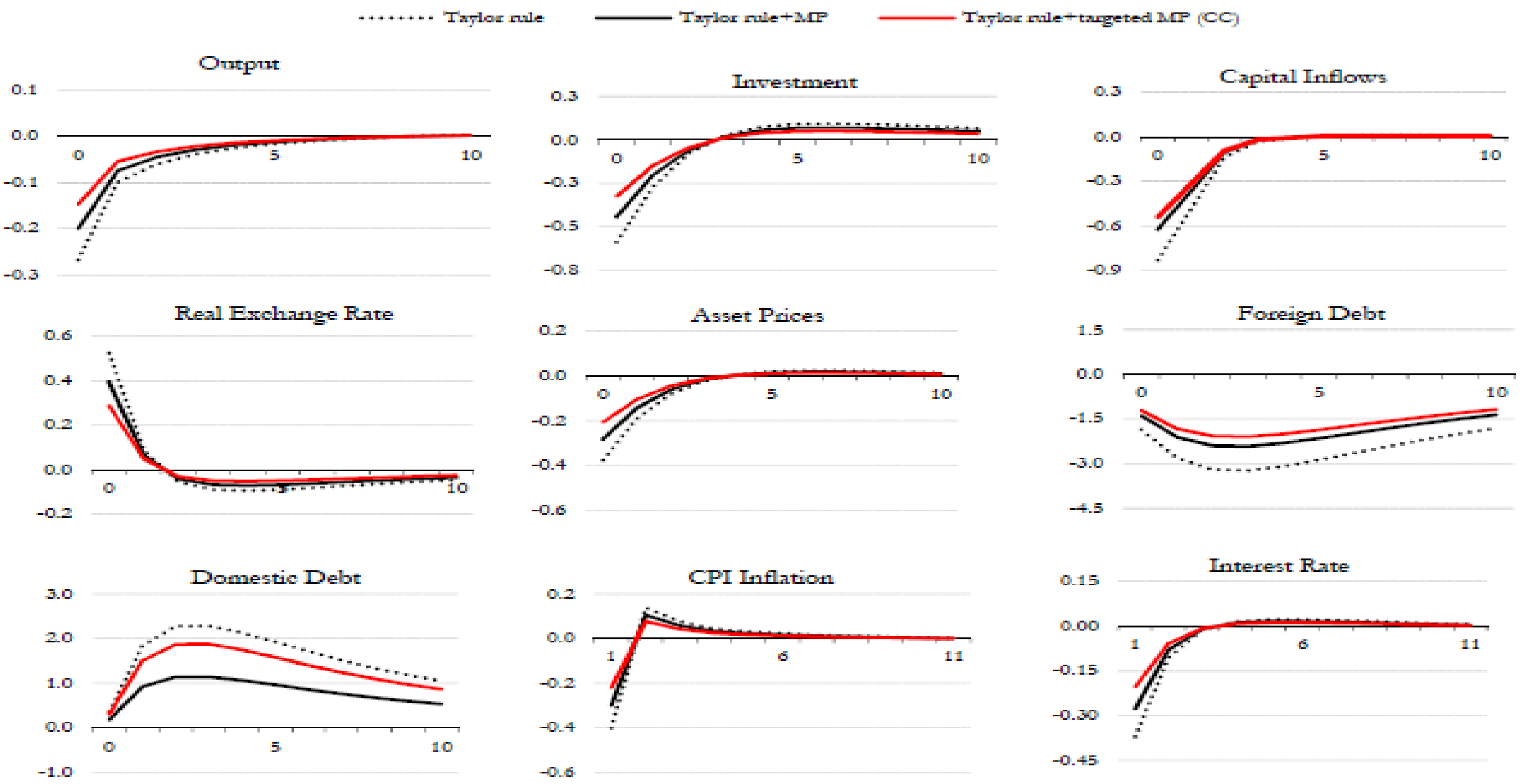


Fig. 6. Responses to a global financial crisis: no contagion (% deviations from the steady state)
Notes: The figures show the impact of a 0.3% (negative) shock to the perception of investors regarding foreign productivity under the zero contagion assumption. The variables are presented as log-deviations from the steady state, multiplied by 100 to have an interpretation of percentage deviations.

Policy measures in response to a global shock Ozkan-Unsal (2018)

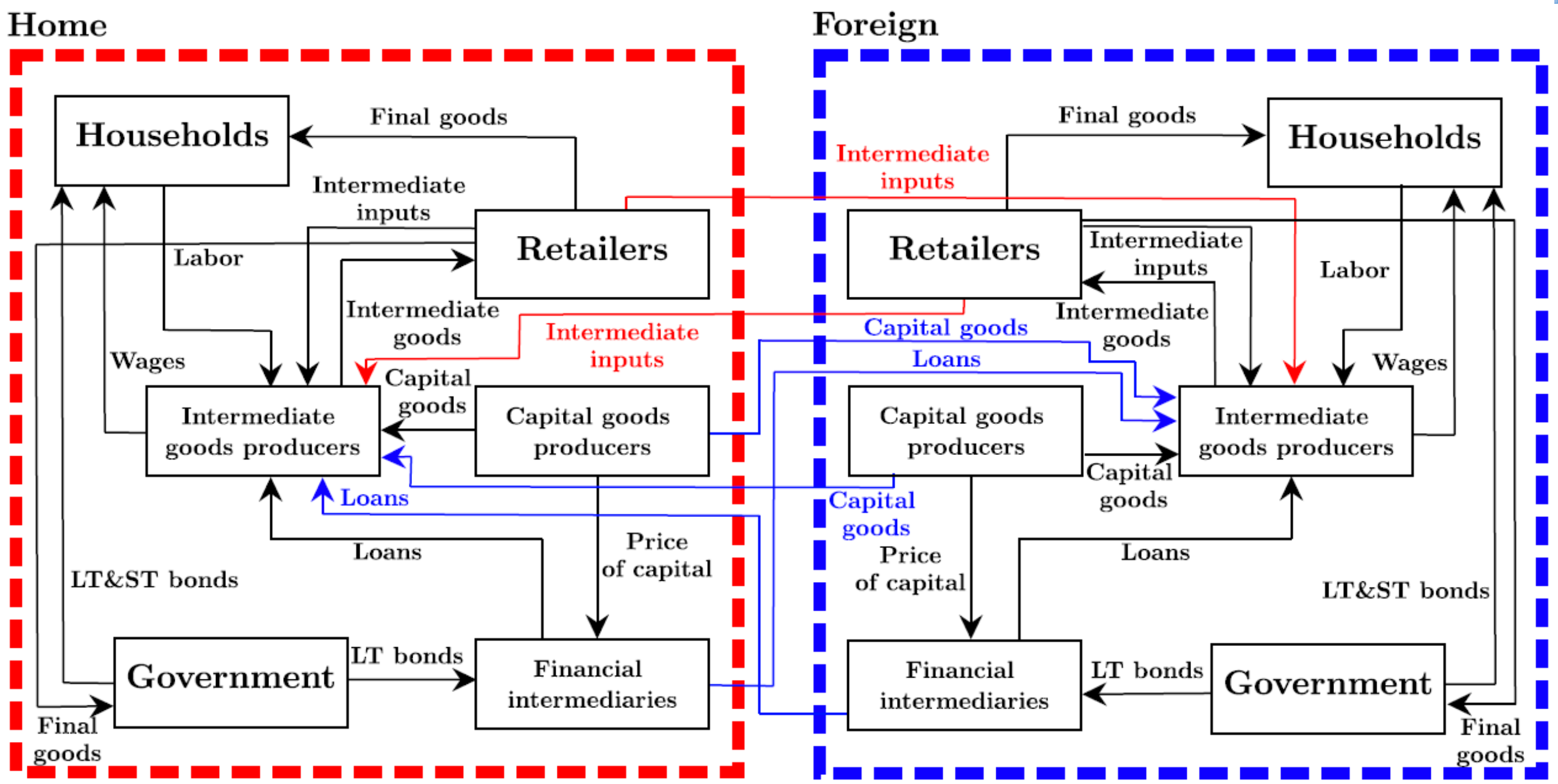


Importance of supply chains –Garcia-Lazaro-Mistak-Ozkan (2021)

Table 5: Responses to non-tariff barriers to trade in goods across the UK-EU border.

	Export price ↑ 5%			Export price ↑ 10%			Export price ↑ 12%		
	UK	EU	ROW	UK	EU	ROW	UK	EU	ROW
Total Output	-0.70 (-0.36)	-0.10 (-0.04)	0.00 (0.00)	-1.35 (-0.68)	-0.18 (-0.08)	0.00 (-0.01)	-1.59 (-0.80)	-0.22 (-0.09)	0.00 (-0.01)
Output ($i = 1$)	-0.32 (0.57)	-0.26 (-0.12)	0.00 (0.01)	-0.57 (1.15)	-0.49 (-0.22)	0.01 (0.02)	-0.65 (1.39)	-0.58 (-0.25)	0.01 (0.02)
Output ($i = 2$)	-0.78 (-0.54)	-0.03 (-0.01)	0.00 (-0.01)	-1.51 (-1.05)	-0.06 (-0.02)	0.00 (-0.02)	-1.78 (-1.24)	-0.07 (-0.02)	0.00 (-0.02)
Total investment	-1.14 (-0.57)	-0.19 (-0.11)	0.00 (0.00)	-2.16 (-1.07)	-0.36 (-0.2)	0.00 (0.00)	-2.55 (-1.25)	-0.43 (-0.23)	-0.01 (0.00)

Flow chart - Mistak-Ozkan (2024)



The benchmark model- HH behaviour

Households maximize their utility:

$$\max_{C_t, H_t, B_t, B_{h,t}} \mathbb{E}_t \sum_{k=0}^{\infty} \beta^k \left[\frac{(C_{t+k} - hC_{t+k-1})^{1-\sigma_c}}{1-\sigma_c} - \vartheta \frac{H_{t+k}{}^{1+\varphi_h}}{1+\varphi_h} \right] \tag{1}$$

subject to a sequence of intertemporal budget constraints:

$$C_t + B_t + B_{h,t} = W_t H_t + R_{b,t} B_{h,t-1} - \frac{1}{2}\kappa \left(B_{h,t} - \bar{B}_h\right)^2 + R_t B_{t-1} + \Pi_t \tag{2}$$

where $0 < \beta < 1$ represents the discount factor, $\vartheta > 0$ denotes the disutility from supplying labor to intermediate goods producers, and $\varphi_h > 0$ is the inverse of the Frisch elasticity of labor supply.

The benchmark model – composite consumption

Households consume both domestically produced, $C_{h,t}$, and imported goods, $C_{f,t}$. Aggregate consumption of households can therefore be expressed as:

$$C_t = \left[\gamma_c^{\frac{1}{\varepsilon_c}} \left(C_{h,t} \right)^{\frac{\varepsilon_c - 1}{\varepsilon_c}} + (1 - \gamma_c)^{\frac{1}{\varepsilon_c}} \left(C_{f,t} \right)^{\frac{\varepsilon_c - 1}{\varepsilon_c}} \right]^{\frac{\varepsilon_c}{\varepsilon_c - 1}} \tag{7}$$

where $0 < \gamma_c < 1$ represents the share of domestically produced goods in total consumption where $\varepsilon_c > 1$ is the elasticity of substitution between locally produced and imported consumer goods.

The benchmark model – supply chains

Intermediate goods producers combine physical capital, labor inputs, and intermediate inputs and transform them into a distinctive good. Take the following Leontief technology with labor H_t, capital K_t, and intermediate inputs XS_t combined as follows:

$$X_t(v) = \left[\frac{H_t(v)^{\alpha} K_t(v)^{1-\alpha}}{1-\varphi_s}, \frac{XS_t(v)}{\varphi_s}\right] \tag{8}$$

where $0 < \varphi_s < 1$ is the share of intermediate inputs in technology.

$$XS_t(v) = \left[\gamma_s{}^{\frac{1}{\varepsilon_s}} \left(XS_{AE,t}(v)\right)^{\frac{\varepsilon_s-1}{\varepsilon_s}} + (1-\gamma_s)^{\frac{1}{\varepsilon_s}} \left(XS_{EE,t}(v)\right)^{\frac{\varepsilon_s-1}{\varepsilon_s}}\right]^{\frac{\varepsilon_s}{\varepsilon_s-1}} \tag{9}$$

where $0 < \gamma_s < 1$ denotes the share of supplies produced in AE in the total use of supplies and $\varepsilon_s > 0$ is the Armington elasticity of substitution between local and imported supplies.

The benchmark model – capital

Capital $K_t(v)$, at both the individual producer and aggregate levels, is composed of local capital $K_{h,t}(v)$ and imported capital $K_{f,t}(v)$ where Z_t denotes the price of the former and Z_t^* the price of the latter denominated in foreign currency, common to all intermediate goods producers. Capital used in the production of intermediate goods is, therefore, given by:

$$K_t(v) = \left[\gamma_k^{\frac{1}{\varepsilon_k}} \left(K_{h,t}(v)\right)^{\frac{\varepsilon_k - 1}{\varepsilon_k}} + (1-\gamma_k)^{\frac{1}{\varepsilon_k}} \left(K_{f,t}(v)\right)^{\frac{\varepsilon_k - 1}{\varepsilon_k}} \right]^{\frac{\varepsilon_k}{\varepsilon_k - 1}} \tag{9}$$

where $0 < \gamma_k < 1$ is the share of local capital in aggregate capital used for production of intermediate goods and $\varepsilon_k > 0$ is the elasticity of substitution between local and imported capital.

The benchmark model – monetary and fiscal policy

$$\frac{r_t}{r} = \left(\frac{r_{t-1}}{r}\right)^{\rho_r} \left[\left(\frac{\pi_t}{\pi}\right)^{\varphi_\pi} \left(\frac{X_t}{X}\right)^{\varphi_x} \right]^{1-\rho_r} exp(\sigma_{r,t}) \tag{40}$$

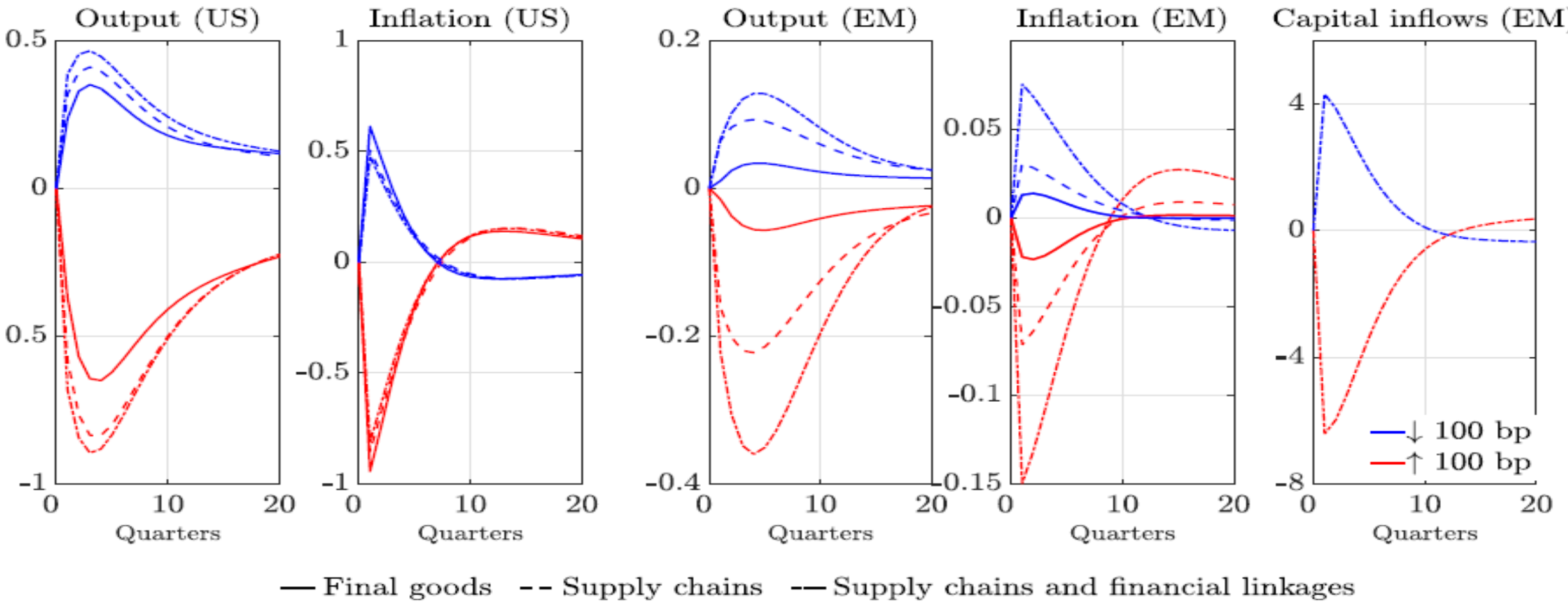
where $0 \leq \rho_r \leq 1$ is the smoothing parameter; $\varphi_\pi > 0$ describes the central bank's weight on the deviations of inflation; $\varphi_x > 0$ describes the central bank's weight on the deviations of output; and $\sigma_{r,t}$ is the conventional monetary policy shock in the form of a one-off innovation to the risk-free rate with a zero mean.

The domestic government fixes its spending on the domestic final good G_t by spending a fixed share τ on local goods:

$$G_t = \tau X_t \tag{43}$$

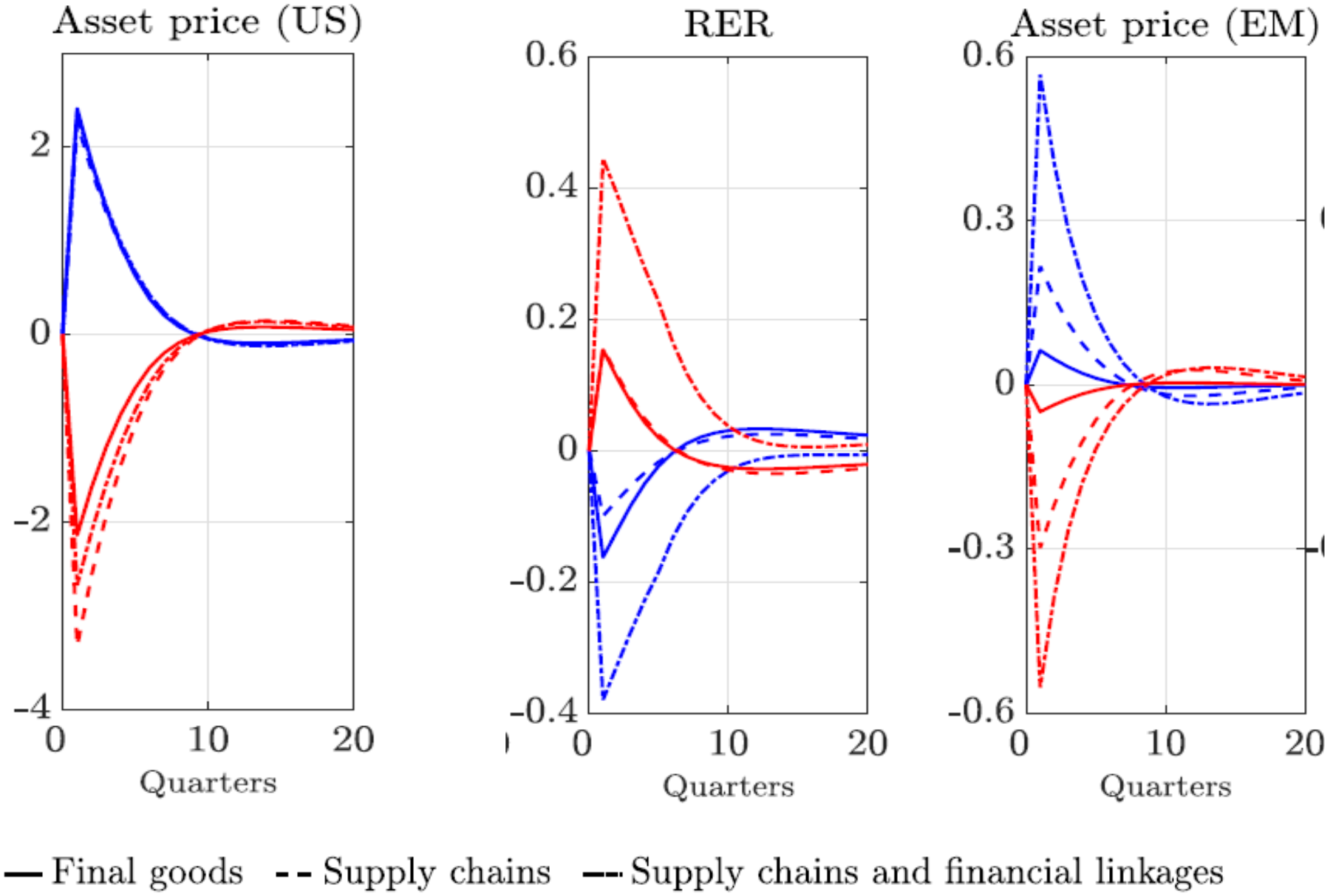
US monetary contraction – output, inflation and capital flows

Figure 2: Responses of output and inflation to the US conventional monetary policy shocks.



Note: The responses are expressed in % deviations from steady-state; the responses of inflation are annualized; responses in blue represent the effects of US monetary policy expansion by 100 basis points, while responses in red represent the effects of US monetary policy tightening by 100 basis points.

US monetary contraction – financial variables



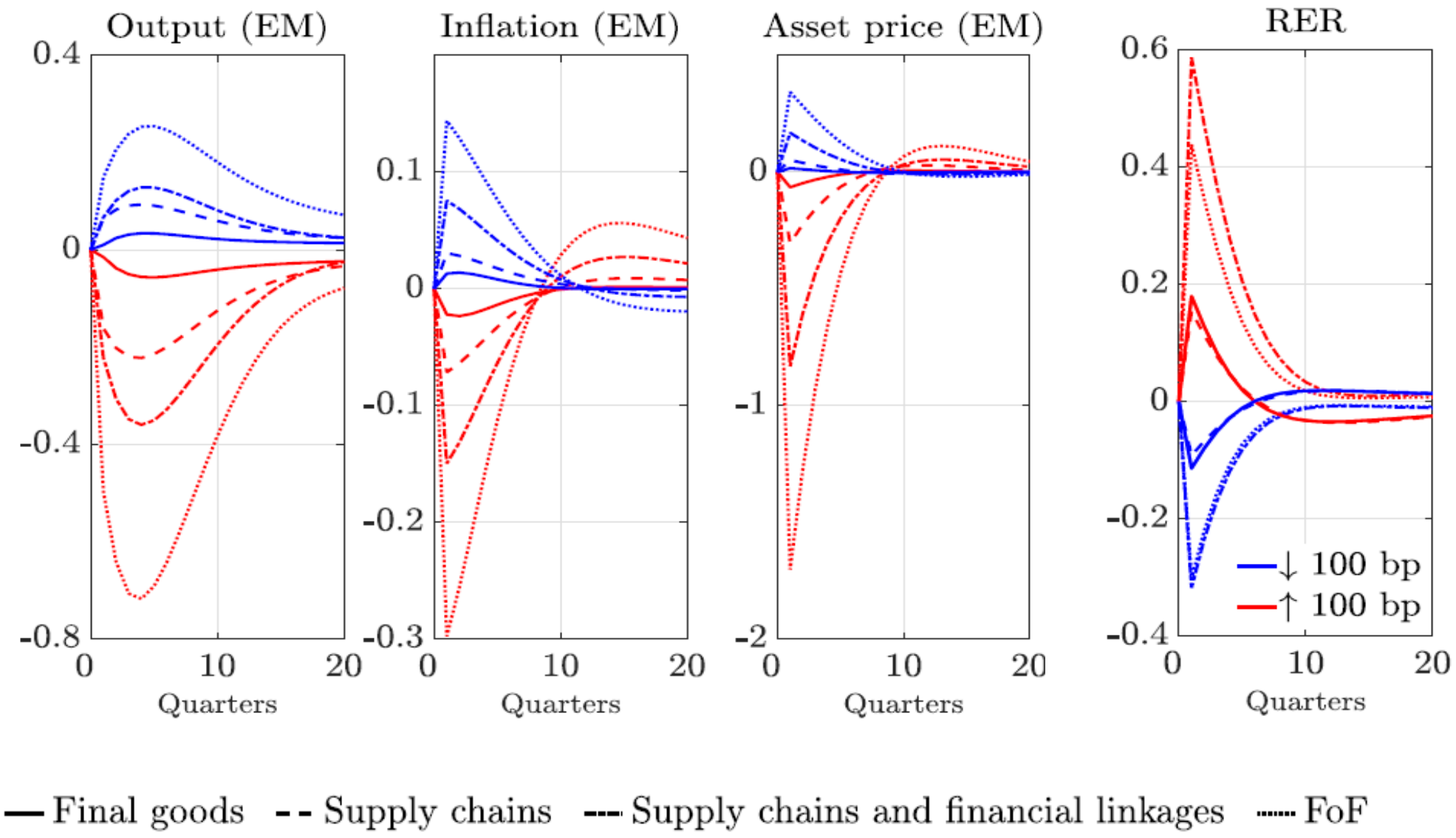
US monetary contraction- fear of floating (1)

To allow us to explore the implications of such FoF behavior on the transmission of external monetary policy shocks on domestic outcomes, we now reconsider the EM monetary policy-making structure by adopting an augmented Taylor rule incorporating exchange rate movements:

$$\frac{r_t}{r} = \left(\frac{r_{t-1}}{r}\right)^{\rho_r} \left[\left(\frac{\pi_t}{\pi}\right)^{\varphi_\pi} \left(\frac{X_t}{X}\right)^{\varphi_x} \left(\frac{s_t}{s}\right)^{\varsigma}\right]^{1-\rho_r} exp(\sigma_{r,t})$$

where ς denotes the degree of policymakers' dislike for the deviations of the nominal exchange rate s_t from its non-stochastic steady state.

US monetary contraction- fear of floating (2)



Conclusions

- Significant asymmetries in the effects of monetary policy shocks across tightening versus loosening episodes
- At the heart of this asymmetry is occasionally binding constraints facing the banking sector
- The asymmetry in the impact of the expansionary versus contractionary US monetary policy does not only spill across borders, it also magnifies
- This asymmetry prevails in the face of both conventional and unconventional monetary policy changes in the US
- Both supply chains and credit networks contribute significantly to the monetary policy spillovers
- EM policymaker's aversion to exchange rate fluctuations plays a major role in aggravating the detrimental effects of US monetary tightening

EXTRAS

Ozkan-Unsal (2017) OEP

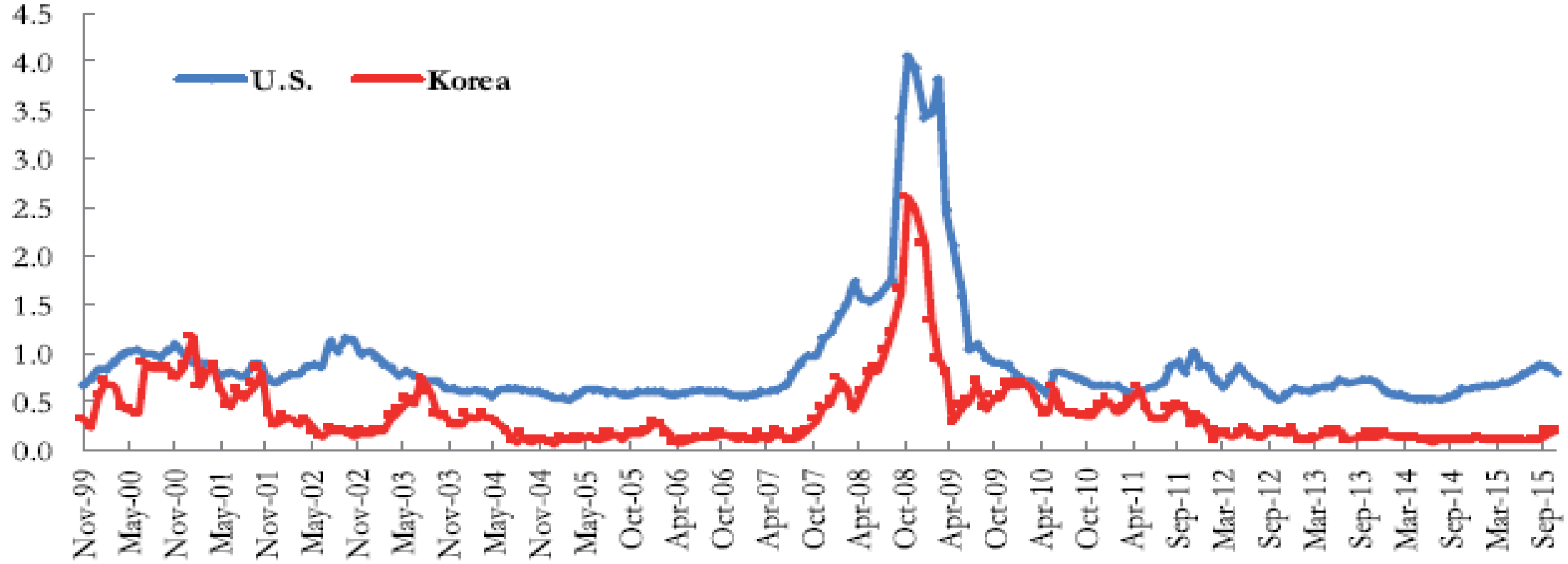


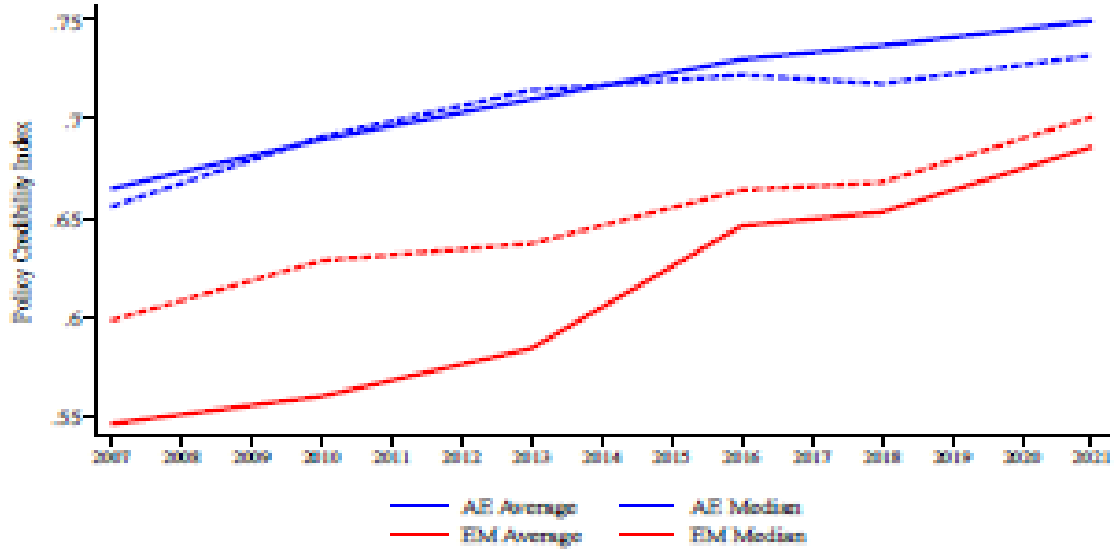
Fig. 2. Corporate bond spreads (1 year) in Korea and the US

Sources: BofA Merrill Lynch; Asian Development Bank.

Why have we not observed another EM crisis? (1)
Kalemli-Ozcan and Unsal (2023)

FX positions and/or capital requirements. By now they ensure FX mismatches on bank and financial intermediary balance sheets are hedged or minimal (IMF (2022)).

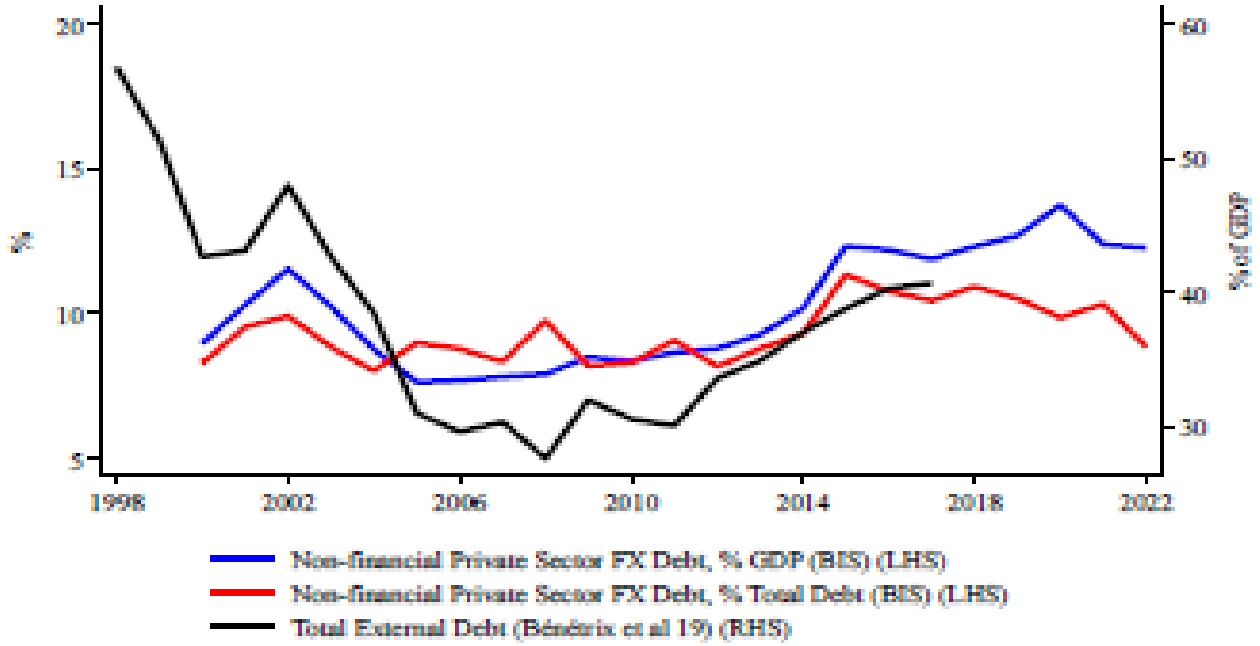
Figure 1: Policy Credibility over Time



Notes: Our measure of policy credibility is the monetary policy frameworks index (IAPOC, Unsal, Papageorgiou and Garbers (2022)). The graph shows the average and median policy credibility in advanced economies (AEs) and emerging market (EMs) from 2007–2021.

Why have we not observed another EM crisis? (2)
Kalemli-Ozcan and Unsal (2023)

Figure 2: Corporate Foreign Exchange Debt in Emerging Markets



Notes: Credit in U.S. dollars to non financial private sector is estimated as the total credit in U.S. dollars minus international debt securities for government and financial institutions. We normalize by total debt and by annual GDP. This data is from BIS for 15 EMs, Bénétrix et al. (2019) data is total external debt as percent of GDP and it includes 25 EMs.