The *Ins & Outs*
of Chinese Monetary Policy Transmission
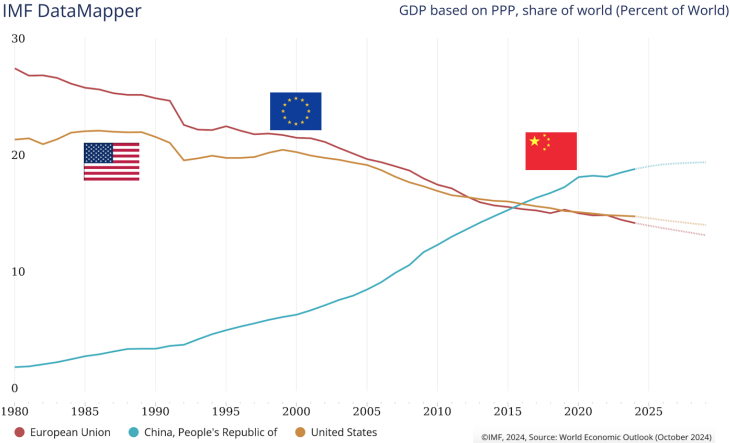
Silvia Miranda-Agrippino[1,4]

Tsvetelina Nenova[2]   Hélène Rey[3,4,5]
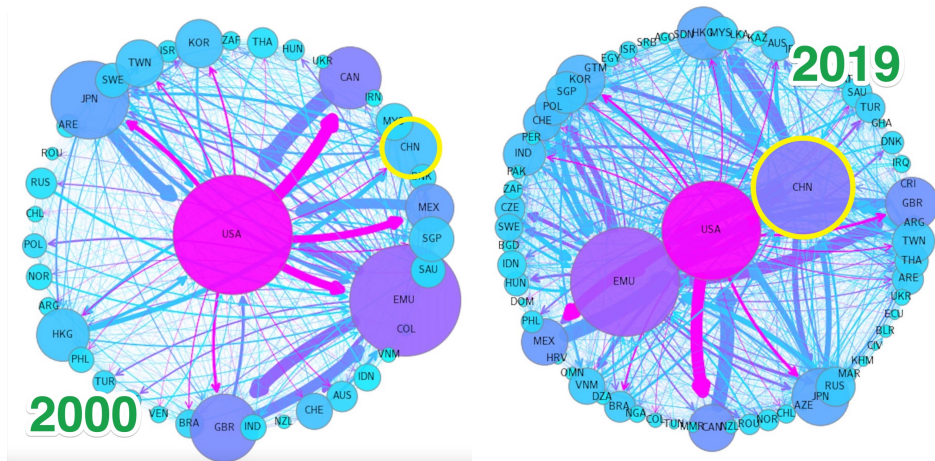
[1]FRBNY   [2]BIS   [3]LBS   [4]CEPR   [5]NBER

30 April 2025

RISE OF CHINA AS A GLOBAL ECONOMIC SUPERPOWER...

IMF DataMapper

GDP based on PPP, share of world (Percent of World)

- ● European Union
- ● China, People's Republic of
- ● United States

©IMF, 2024, Source: World Economic Outlook (October 2024)

Note: Merchandise trade, excludes services. IMF's Direction of Trade Statistics (DOTS). 2000 vs 2019.

Empirical characterisation of the domestic (the *Ins*) and international (the *Outs*) transmission of Chinese monetary policy

> **Empirical characterisation of the domestic (the *Ins*) and international (the *Outs*) transmission of Chinese monetary policy**

▷ Outline:

1. Evolution of the Chinese monetary policy framework: **PBOC policy stance & rule**

2. **The *Ins***: Macroeconomic aggregates, interest rates and exchange rate policy

3. **The *Outs***: Financial conditions, international trade, commodity prices, inflation

> **Empirical characterisation of the domestic (the *Ins*) and international (the *Outs*) transmission of Chinese monetary policy**

▷ Outline:

1. Evolution of the Chinese monetary policy framework: **PBOC policy stance & rule**

2. **The *Ins*:** Macroeconomic aggregates, interest rates and exchange rate policy

3. **The *Outs*:** Financial conditions, international trade, commodity prices, inflation

▷ **Preview:**

○ Standard domestic transmission channels

○ Powerful role of commodity prices & production networks in shaping international spillovers

RELATED LITERATURE

- **Chinese Policy Landscape** Chen, Chen and Gerlach (2013); Jones and Bowman (2019); Das (2019); Kim and Chen (2022); Jermann, Wei and Yue (2022); Bahaj and Reis (2024)

- **Identification of Chinese Policy Shocks** Chen, Ren and Zha (2018); Sun (2018, 2020); Kamber and Mohanty (2018); Barcelona, Cascaldi-Garcia, Hoek and Van Leemput (2022); Das and Song (2022); Shieh (2024)

- **Transmission of Chinese Shocks** Fernald, Spiegel and Swanson (2014); McMahon, Schipke and Li (2018); Chen, Ren and Zha (2018, 2023); Funke and Tsang (2021); Barcelona, Cascaldi-Garcia, Hoek and Van Leemput (2022); Gazzani and Ferriani (2024)

A Policy Rule for the PBOC

THE PBOC MANDATE

▷ *"To maintain currency stability has two tiers of meaning"* [Gov. Yi Gang (2018)]

▷ *"To maintain currency stability has two tiers of meaning"* [Gov. Yi Gang (2018)]

1. *"Internally it means to maintain prices stable"*
2. *"Externally it means to keep the exchange rate stable at an adaptive and equilibrium level"*

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ⟹ **Operational framework based on market interest rates**

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets → **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ➡ **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

2000:2005 Benchmark lending & deposit rates, M2 growth as intermediate target [Gang (2018)]

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ⟹ **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

2000:2005 Benchmark lending & deposit rates, M2 growth as intermediate target [Gang (2018)]
2005:2012 Addition of RRR for Chinese banks to regulate liquidity [Jones & Bowman (2019)]

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ⟹ **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

2000:2005 Benchmark lending & deposit rates, M2 growth as intermediate target [Gang (2018)]

2005:2012 Addition of RRR for Chinese banks to regulate liquidity [Jones & Bowman (2019)]

2012:2015 Aggregate financing to real economy (aka TSF) as intermediate target [Gang (2018)]

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ⟹ **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

2000:2005 Benchmark lending & deposit rates, M2 growth as intermediate target [Gang (2018)]

2005:2012 Addition of RRR for Chinese banks to regulate liquidity [Jones & Bowman (2019)]

2012:2015 Aggregate financing to real economy (aka TSF) as intermediate target [Gang (2018)]

2015:2017 Monetary operations & lending facilities. Corridor system [Gang (2021)]

EVOLUTION OF CHINESE MONETARY POLICY FRAMEWORK

▷ **Monetary Policy Operating Framework**
Profound changes since the 1990s [e.g. Chow & Perkins (2014), Fernald, Spiegel & Swanson (2014), Kim & Chen (2022)]

Quantity-based policy instruments & targets ⟹ **Operational framework based on market interest rates**

▷ Five Phases since 2000s:

2000:2005 Benchmark lending & deposit rates, M2 growth as intermediate target [Gang (2018)]

2005:2012 Addition of RRR for Chinese banks to regulate liquidity [Jones & Bowman (2019)]

2012:2015 Aggregate financing to real economy (aka TSF) as intermediate target [Gang (2018)]

2015:2017 Monetary operations & lending facilities. Corridor system [Gang (2021)]

2017:2019 Two policy rates (R007 & MLF) control interbank & aggregate lending [Gang (2021)]

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

    2000:2005 Strict US dollar peg at 8.2765¥ per 1$

CHINESE MONETARY POLICY FRAMEWORK: EXCHANGE RATE POLICY

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

2000:2005 Strict US dollar peg at 8.2765¥ per 1$

2005:2015 Limited trading around Central Parity Rate against small basket of currencies

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

2000:2005 Strict US dollar peg at 8.2765¥ per 1$

2005:2015 Limited trading around Central Parity Rate against small basket of currencies

2015:2019 Two tier system of stable exchange rate against CFETS basket and allowing the ¥/$ to reflect market forces

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

2000:2005 Strict US dollar peg at 8.2765¥ per 1$

2005:2015 Limited trading around Central Parity Rate against small basket of currencies

2015:2019 Two tier system of stable exchange rate against CFETS basket and allowing the ¥/$ to reflect market forces

○ Managing the exchange rate requires substantial interventions in FX markets [Das (2019), Adler, Chang, Mano & Shao (2021)]

▷ Similar liberalisation principle [e.g. Das (2019), Jermann, Wei & Yue (2022)]

Strict USD peg ⟹ **Crawling peg (CPR & USD)**

▷ Three Phases since 2000s:

**2000:2005** Strict US dollar peg at 8.2765¥ per 1$

2005:2015 Limited trading around Central Parity Rate against small basket of currencies

2015:2019 Two tier system of stable exchange rate against CFETS basket and allowing the ¥/$ to reflect market forces

○ Managing the exchange rate requires substantial interventions in FX markets [Das (2019), Adler, Chang, Mano & Shao (2021)]

○ Policy independence with managed exchange rate requires implementing strict capital controls [Bahaj & Reis (2024)]

COMPOSITE MONETARY POLICY INDICATOR CMPI

▷ **Novel proprietary index** for the PBOC policy stance [Xu & Jia (2019)]

○ From quantity-based instruments (quotas, RRR) and targets (M2, TSF growth), to price-based instruments (corridor system, R007, MLF rate) and targets (interbank lending rates, LPR).
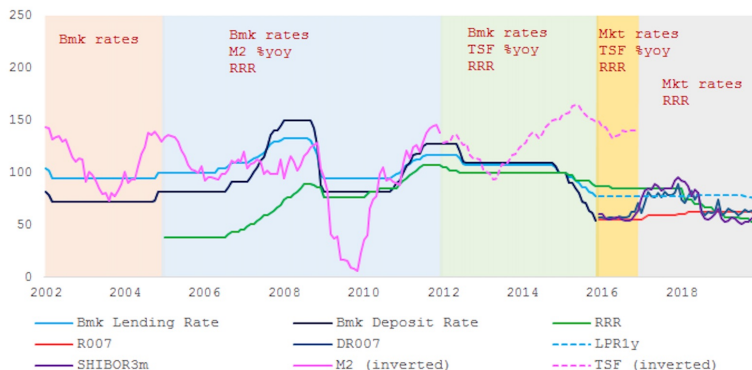
POLICY RULE FOR THE PBOC: CHEN, REN & ZHA (2018)

▷ **Nonlinear rule with official annual Chinese Gov't objectives for growth & inflation**

$$\Delta M2_t = \phi_0 + \phi_M \Delta M2_{t-1} + \phi_\pi (\pi_{t-1} - \pi_\tau^*) + \phi_{y,t}(y_{t-1} - y_\tau^*)$$

$$\phi_{y,t} = \begin{cases} \phi_{y,H} & \text{if } y_{t-1} - y_\tau^* \geq 0 \\ \phi_{y,L} & \text{if } y_{t-1} - y_\tau^* < 0 \ , \end{cases}$$

▷ **Nonlinear rule with official annual Chinese Gov't objectives for growth & inflation**

$$\Delta M2_t = \phi_0 + \phi_M \Delta M2_{t-1} + \phi_\pi(\pi_{t-1} - \pi_\tau^*) + \phi_{y,t}(y_{t-1} - y_\tau^*)$$

$$\phi_{y,t} = \begin{cases} \phi_{y,H} & \text{if } y_{t-1} - y_\tau^* \geq 0 \\ \phi_{y,L} & \text{if } y_{t-1} - y_\tau^* < 0 \, , \end{cases}$$

▷ Innovations wrt Chen, Ren & Zha (2018)

1. Policy indicator consistent with PBOC's use of multiple instruments
2. Explicit currency stability objective
3. Estimated threshold for endogenous switching
4. Sample and sampling frequency

Generalised PBOC Monetary Policy Rule

▷ **Nonlinear rule with <u>official Chinese Gov't objectives</u> for growth, inflation, & FX**

▷ **Nonlinear rule with <u>official Chinese Gov't objectives</u> for growth, inflation, & FX**

$$\iota_{\mathbf{t}} = \phi_{\mathbf{0}} + \phi_{\iota}\iota_{\mathbf{t-1}} + \phi_{\pi}\tilde{\pi}_{\mathbf{t-1}} + \phi_{\mathbf{y,t}}\tilde{\mathbf{y}}_{\mathbf{t-1}} + \phi_{\mathbf{x}}\tilde{\mathbf{x}}_{\mathbf{t-1}}$$
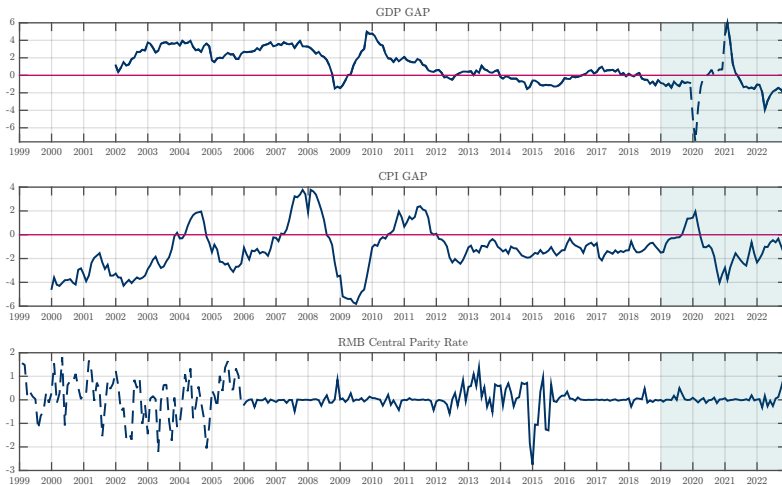
$$\tilde{\pi}_t \equiv \pi_t - \pi_\tau^*$$

$$\phi_{y,t} = \begin{cases} \phi_{y,H} & \text{if } \tilde{y}_{t-1} \equiv y_{t-1} - y_\tau^* \geq \bar{y} \\ \phi_{y,L} & \text{if } \tilde{y}_{t-1} \equiv y_{t-1} - y_\tau^* < \bar{y} \,, \end{cases}$$

$$\tilde{x}_t \equiv \Delta CPR_t \times \mathbb{I}_{t>2006:01}(RMB_{spot,t} - CPR_t)$$

▷ Estimated with monthly data from 2002:01 to 2019:12

GDP GAP

CPI GAP

RMB Central Parity Rate

$$CMPI_t = \begin{cases} \underset{\substack{0.954 \\ (54.538)}}{\phi_\iota} CMPI_{t-1} + \underset{\substack{0.026 \\ (3.469)}}{\phi_\pi} \tilde{\pi}_{t-1} + \underset{\substack{0.002 \\ (0.392)}}{\phi_{y,t}} \tilde{y}_{t-1} + \underset{\substack{-0.036 \\ (-1.831)}}{\phi_x} \tilde{x}_{t-1} & \text{if } \tilde{y}_{t-1} \geq 1\% \\ \\ \underset{\substack{0.954 \\ (54.538)}}{\phi_\iota} CMPI_{t-1} + \underset{\substack{0.026 \\ (3.469)}}{\phi_\pi} \tilde{\pi}_{t-1} + \underset{\substack{0.069 \\ (2.579)}}{\phi_{y,t}} \tilde{y}_{t-1} + \underset{\substack{-0.036 \\ (-1.831)}}{\phi_x} \tilde{x}_{t-1} & \text{if } \tilde{y}_{t-1} < 1\% \end{cases}$$

$$CMPI_t = \begin{cases} \underset{\substack{0.954 \\ (54.538)}}{\phi_\iota} \ CMPI_{t-1} + \underset{\substack{0.026 \\ (3.469)}}{\phi_\pi} \ \tilde{\pi}_{t-1} + \underset{\substack{0.002 \\ (0.392)}}{\phi_{y,t}} \ \tilde{y}_{t-1} + \underset{\substack{-0.036 \\ (-1.831)}}{\phi_x} \ \tilde{x}_{t-1} & \text{if } \tilde{y}_{t-1} \geq 1\% \\[3em] \underset{\substack{0.954 \\ (54.538)}}{\phi_\iota} \ CMPI_{t-1} + \underset{\substack{0.026 \\ (3.469)}}{\phi_\pi} \ \tilde{\pi}_{t-1} + \underset{\substack{0.069 \\ (2.579)}}{\phi_{y,t}} \ \tilde{y}_{t-1} + \underset{\substack{-0.036 \\ (-1.831)}}{\phi_x} \ \tilde{x}_{t-1} & \text{if } \tilde{y}_{t-1} < 1\% \end{cases}$$

The *Ins*
Domestic transmission of Chinese Monetary Policy

1. Monthly VAR(6) standard NIW priors [Giannone, Lenza & Primiceri (2015)]
   ▷ **Estimation Sample:**   2002-2019/2006-2019

2. Identification with rule residuals as internal IV [Plagborg-Moller & Wolf (2021)]
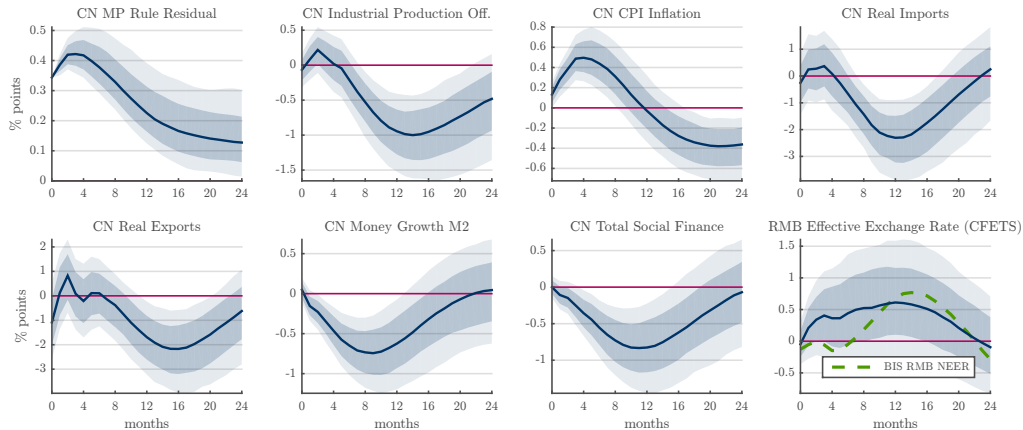   ▷ **Identification Sample:**   2002-2019/2006-2019

3. VAR Composition
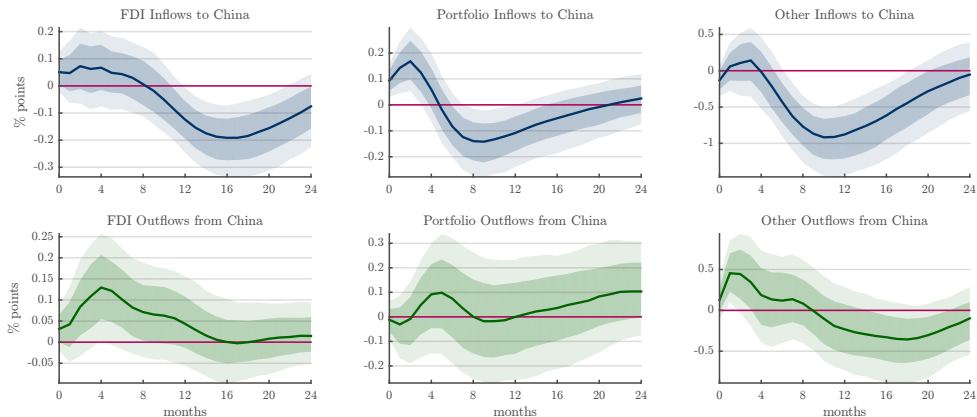   ▷ **Core:** Industrial Production, CPI, Real Imports & Exports, M2 & TSF growth
   ▷ **Rotating:** Exchange rates, capital flows, FX reserves & interventions, Interest rates
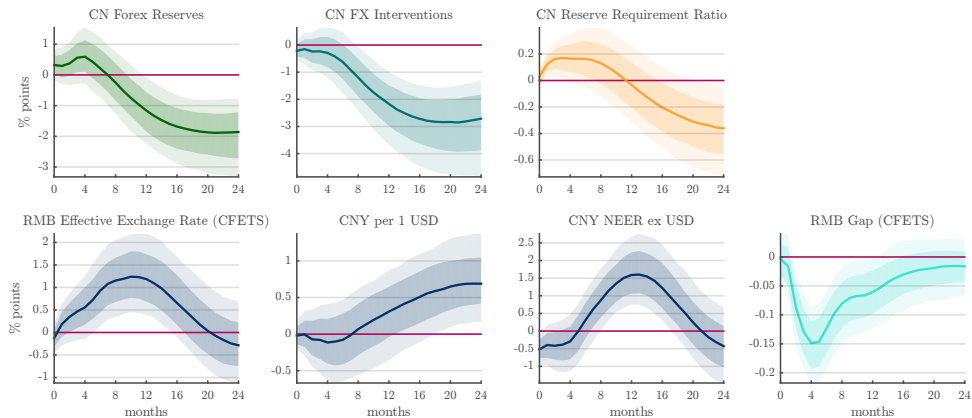
The *Ins*: Domestic Macro Aggregates

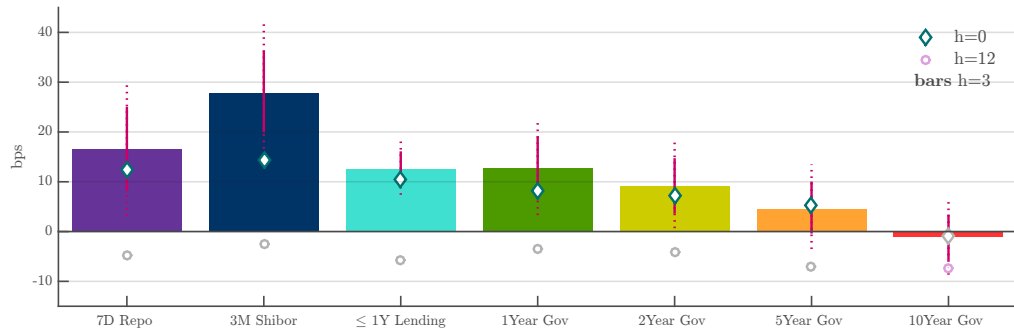Median IRFs, 68% & 90% posterior credible sets, 2002:2019.

FDI Inflows to China

Portfolio Inflows to China

Other Inflows to China

FDI Outflows from China

Portfolio Outflows from China

Other Outflows from China

Median IRFs, 68% & 90% posterior credible sets, 2006:2019. Different colours for different VARs.

Median IRFs, 68% & 90% posterior credible sets, 2006:2019. Different colours for different VARs.
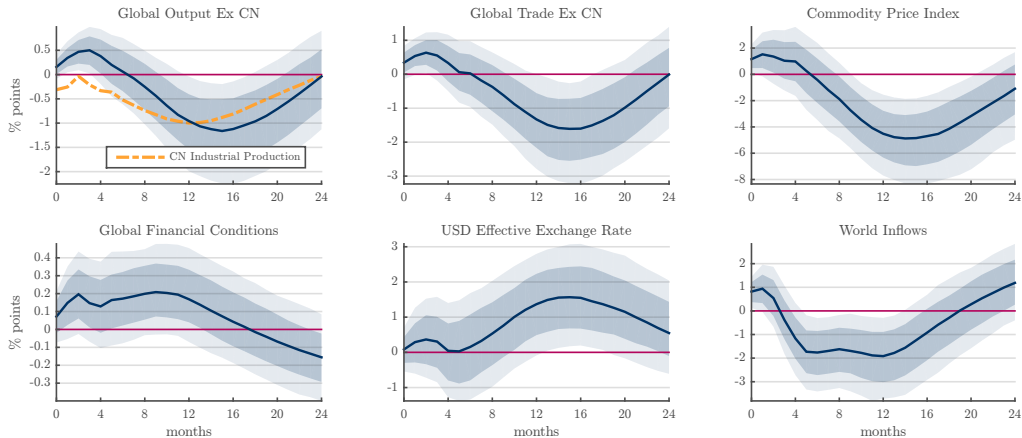
The *Ins*: Lending & market interest rates

Median IRFs, 68% & 90% posterior credible sets at selected horizons, 2006:2019. Different colours for different VARs.
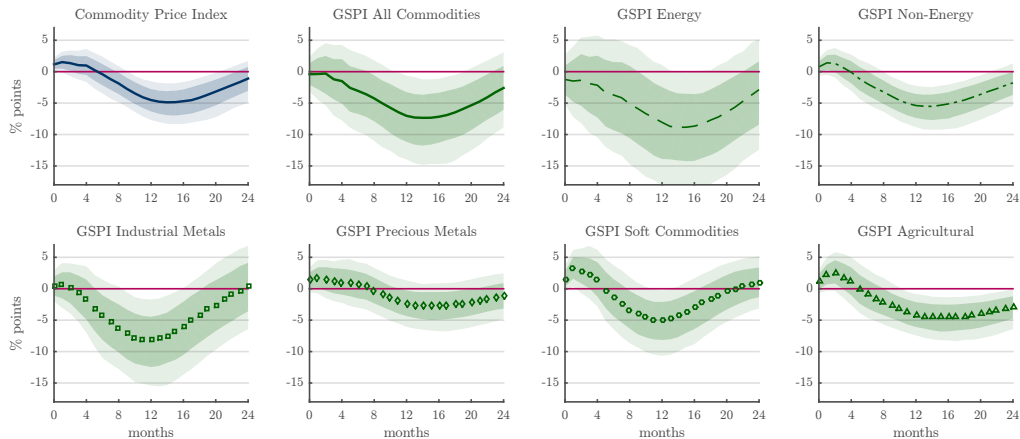
The *Outs*
Global Spillovers of Chinese Monetary Policy

The *Outs*: Global output & trade, financial conditions

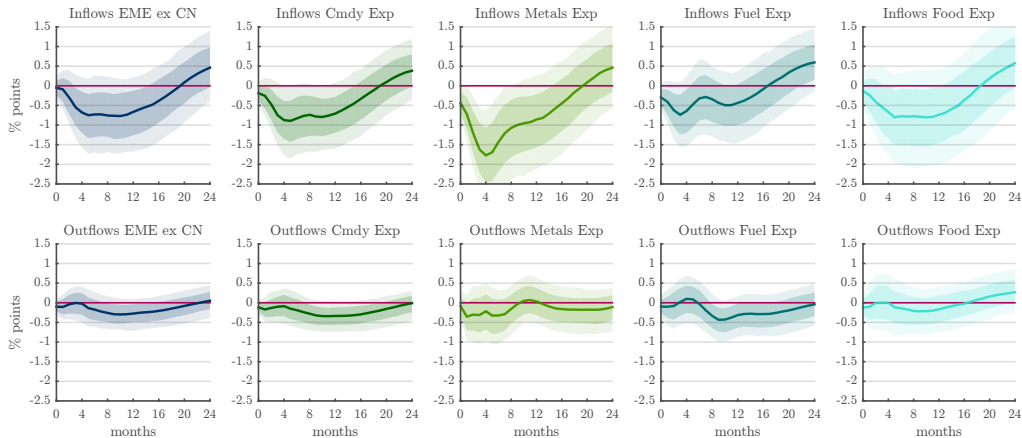Median IRFs, 68% & 90% posterior credible sets, 2002:2019. Different colours/markers for different VARs.

o Strongest response for infrastructure-related commodities [Ferriani & Gazzani (2024)]

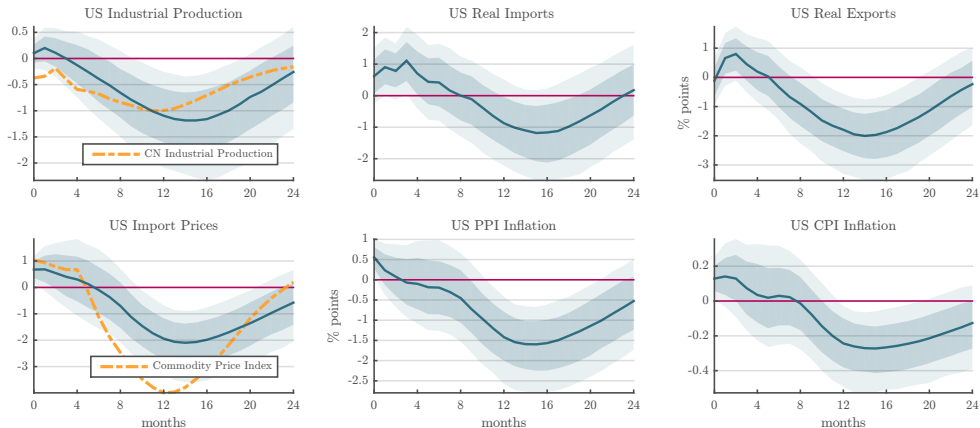Median IRFs, 68% & 90% posterior credible sets, 2002:2019. Different colours/markers for different VARs.

Median IRFs, 68% & 90% posterior credible sets, 2002:2019. Different colours/markers for different VARs.

THE *Outs*: SPILLOVERS TO THE US ECONOMY

Median IRFs, 68% & 90% posterior credible sets, 2002:2019. Different colours/markers for different VARs.

CONCLUSIONS

▷ **Empirical characterisation of the transmission of Chinese monetary policy**
  - **Novel composite indicator for the PBOC monetary policy stance**
  - **Novel generalised monetary policy rule for the PBOC**

▷ **The *Ins***
  - MP tightening leads to a contraction in domestic activity, prices & imports from ROW
  - Strong response of lending and market rates, contraction of aggregate lending
  - 'Traditional' smooth transmission along the yield curve
  - Constrained responses of capital flows & FX, intervention in FX markets

▷ **The *Outs***
  - Global spillovers primarily through trade, commodities, integrated production
  - Limited role for transmission through Global Financial Cycle
  - Large spillovers to US activity and prices