The Distributional Effects of Monetary Policy Shocks in China

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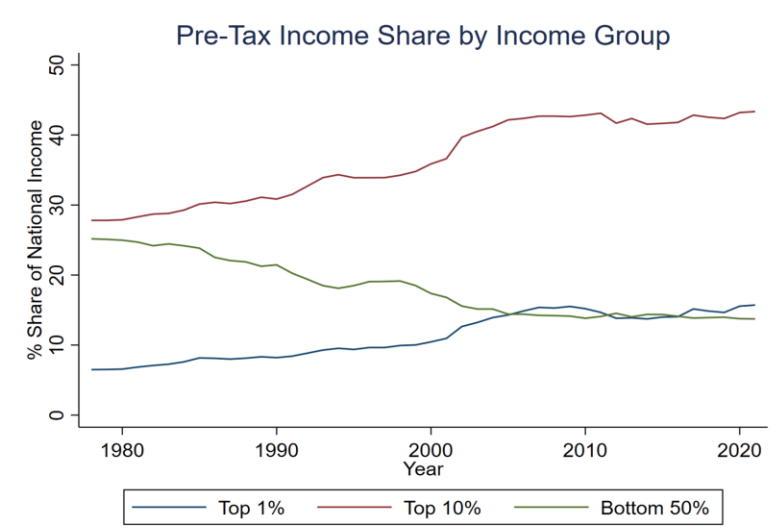
Motivation

Empirical Motivation:

Limited research on the connection between

1. Rise in inequality since reform & opening
2. Monetary policy regime converging towards a rate-based framework



Methodological Motivation:

Shortcomings in empirical strategy

1. Assumptions about central bank policy rule
2. Endogeneity of policy decisions with macroeconomic variables
3. Use of aggregate measures (e.g., Gini coefficient)

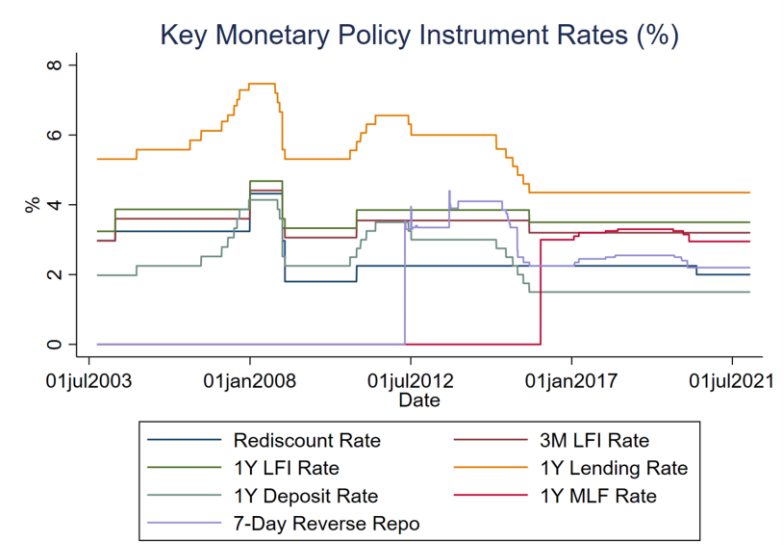
Research Questions

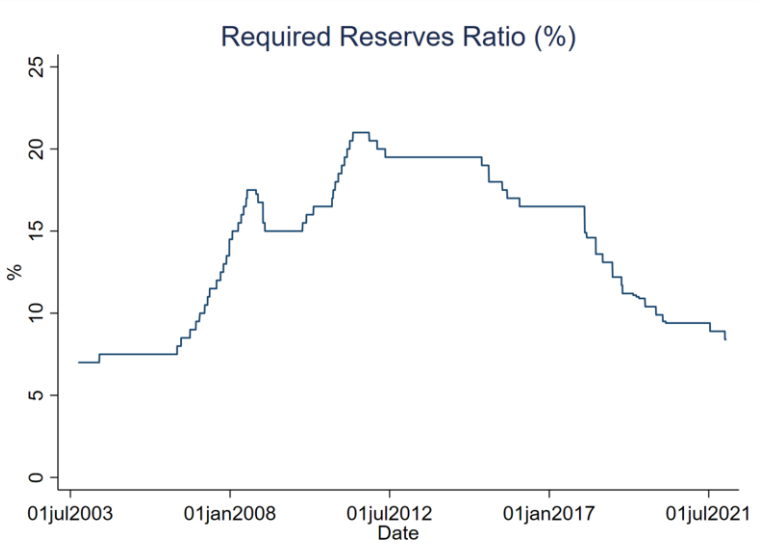
1. Do monetary policy shocks have an impact on income inequality in China?

2. Can they be explained by differences in income composition along the distribution?

Background on China's Monetary Policy

1. **Multiple objectives**: price stability, economic growth, employment, BOP
2. **Numerous instruments/targets**: money supply, bank credit, market interest rates
3. **Lack of independence**: advisory role to State Council





Literature Review: MP Shocks and Inequality

Advanced Economies:

- HANK (Heterogeneous Agent New Keynesian) model
- MP shock effects differ along the income distribution due to heterogeneity in household income and balance sheet composition

China: limited in scope and methodology

- Sanchez-Fung (2015): only statistically significant effect through unemployment
- Xiang et al. (2022): expansionary MP shocks increase inequality due to weaker financial market development and participation
- Cheng and Lin (2022): expansionary MP shocks increase rural-urban inequality through cost inflation

Literature Review: MP Shock Identification

Advanced Economies:

- Romer and Romer (2004)
- High-Frequency Identification (HFI) using external financial instruments

China:

- Chen et al. (2018): Romer-Romer type using M2 growth
- Miranda-Agrippino et al. (2020): Romer-Romer type using monetary policy index
- Kamber and Mohanty (2018): HFI using interbank 7-day repo rate on policy dates
- Das and Song (2020): HFI but extended to include communication events

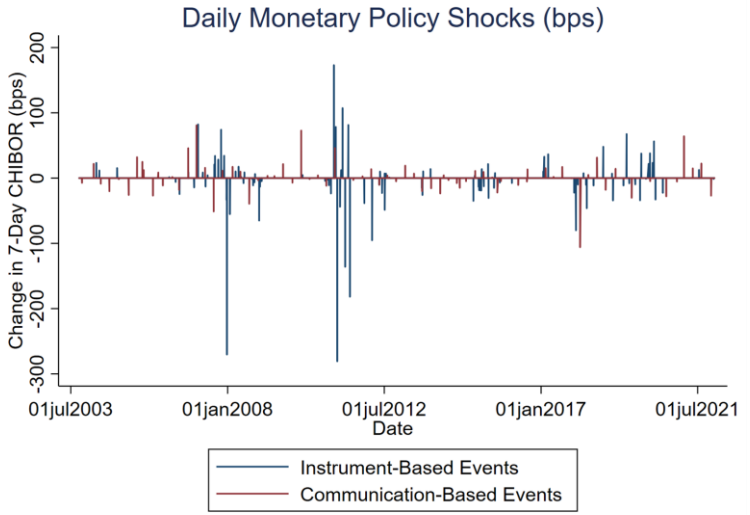
Methodology: Monetary Policy Shock Series

High-Frequency Identification (HFI) Using External Financial Instruments

Policy Shock Indicator: daily changes of the 7-day China Interbank Offered Rate (CHIBOR) around 188 monetary policy events from 2003 to 2021 (111 instrument-based changes + 77 central bank announcements)

Movements in CHIBOR by Policy Event (09/23/2003 - 12/31/2021)

	Mean $\lvert\triangle CHIBOR\rvert$ (bps)	Std Dev $\triangle CHIBOR$ (bps)
All Instrument Events	**30.2**	**46.4**
RRR	36.5	56.9
Rediscount, 3-Month and 1-Year LFI Rate	29.0	25.6
Benchmark 1-Year Lending and Deposit Rate	31.7	45.0
1-Year MLF Rate	26.4	12.1
7-Day Reverse Repo Rate	17.1	13.9
All Communication Events	**17.1**	**19.2**
Quarterly monetary policy reports		
Foreign exchange policy reforms		
Introduction of the MLF in 2014		
All Policy Events	**25.0**	**38.3**
Non-Event Days	**19.0**	**29.2**



Methodology: Impulse Responses

Structural Vector Autoregression (SVAR):

$$Ay_t = C_1 y_{t-1} + C_2 y_{t-2} + \ldots + B\epsilon_t$$

Reduced-form VAR for Estimation:

$$y_t = A^{-1}C_1 y_{t-1} + A^{-1}C_2 y_{t-2} + \ldots + u_t \qquad u_t = A^{-1}B\epsilon_t$$

Cholesky Identification for Short-Run Restrictions:

$$A = \begin{bmatrix} * & 0 & \ldots \\ \vdots & \ddots & \vdots \\ * & \ldots & * \end{bmatrix}$$

$$B = I$$

Identifying Assumptions:

$$E(u_t \epsilon_t^{p'}) = \phi \neq 0$$

$$E(\triangle i_t \epsilon_t^{q'}) = 0$$

Data

Impulse Variable: monetary policy shock series constructed using 7-day CHIBOR
Macroeconomic Covariates: real GDP growth, unemployment, inflation, exchange rate
Response Variables:

- Annual pre-tax income share of the top 1%, top 50%, and bottom 50%
- Annual average personal disposable income by quintile
- Annual and quarterly average personal disposable income by source (labor, business, property, transfer) for total, urban, and rural groups
- Monthly aggregated YoY return on the CSI 300 Index
- Monthly aggregated YoY change in average residential property prices

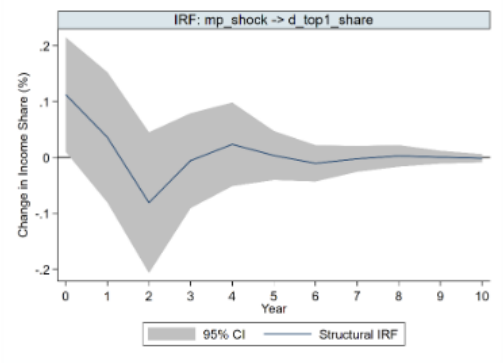
Data Sources: CEIC China Premium Database, China Family Panel Studies (CFPS), National Bureau of Statistics of China (NBS), World Bank, World Inequality Database

Results: Income Share

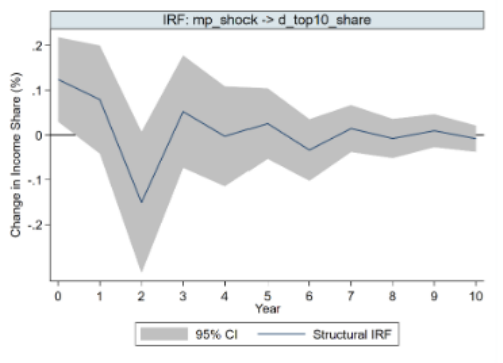
A 100-bp contractionary monetary policy shock (interest rate increase):

- **Increases the relative top 1% and top 10% shares**
- **Decreases the bottom 50% share of national income**

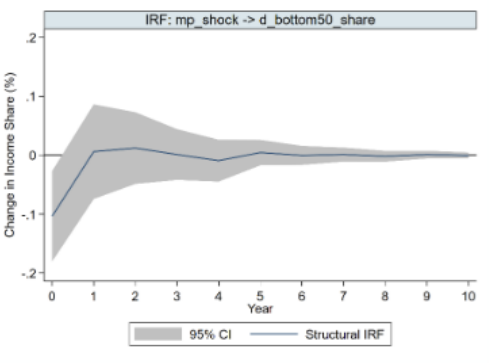
(a) Top 1% Share



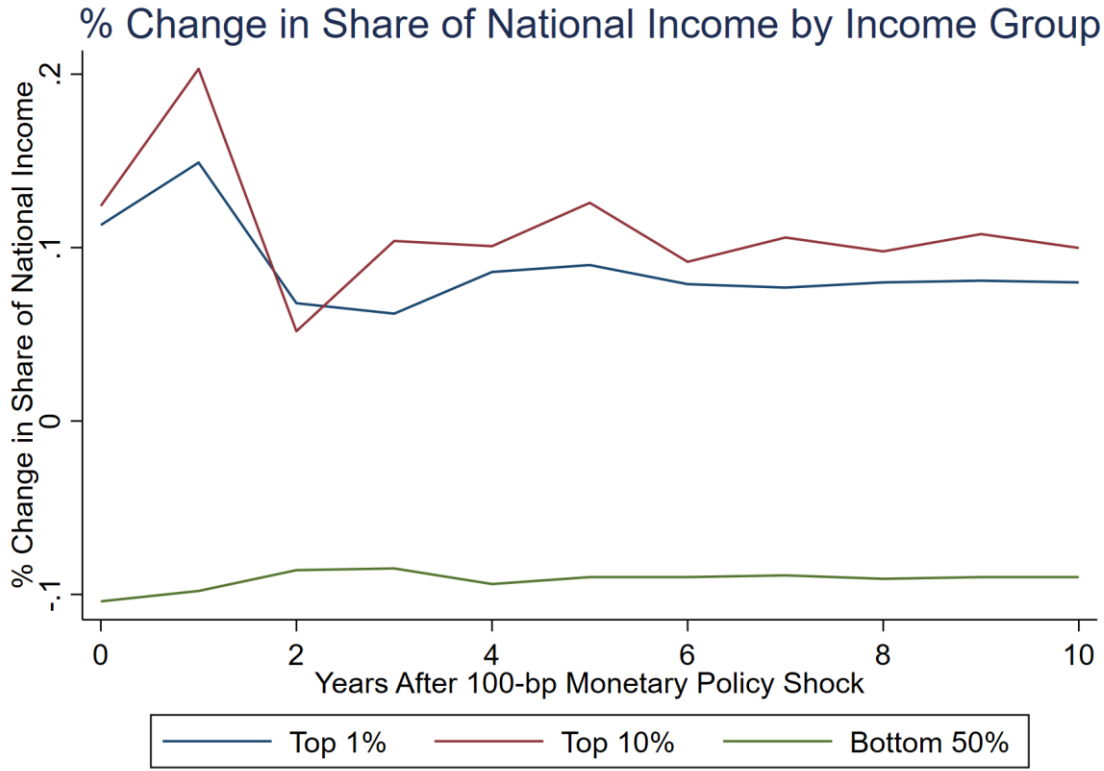
(b) Top 10% Share



(c) Bottom 50% Share

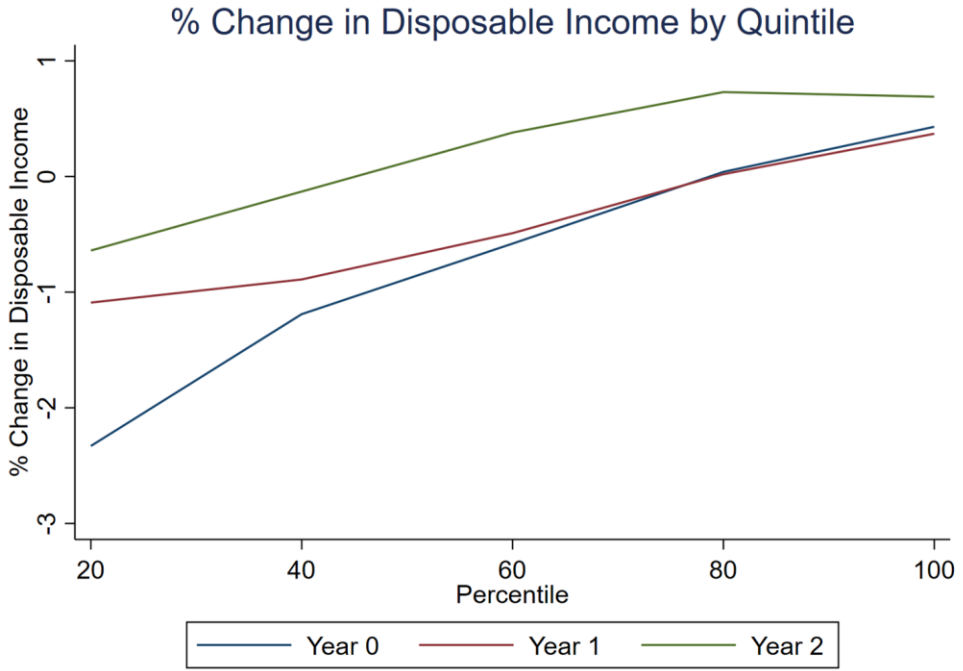


Results: Income Share



Results: Disposable Income by Quintile

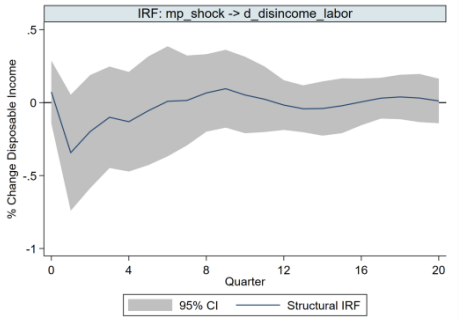
A 100-bp contractionary monetary policy shock (interest rate increase): **Adversely affects lower-quintile income groups more**



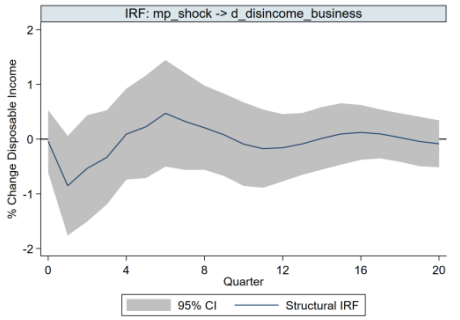
Results: Disposable Income by Source

A 100-bp contractionary monetary policy shock (interest rate increase): **Adversely affects labor and business income more and leads to a persistent drop in transfer income (counterintuitive)**

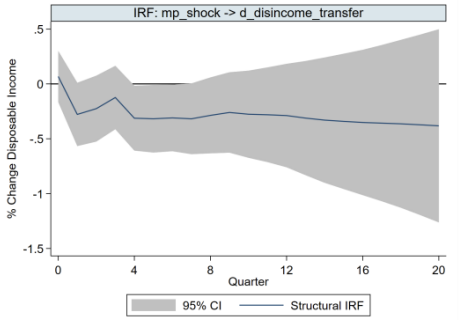
(a) Labor Income



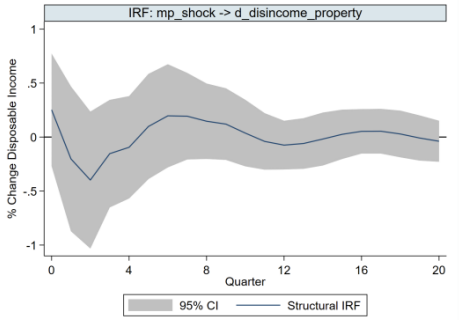
(b) Business Income



(c) Transfer Income



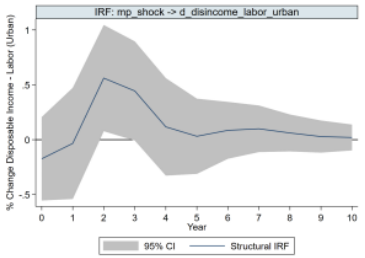
(d) Property Income



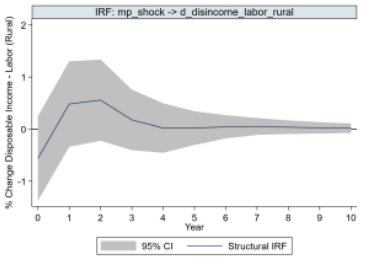
Results: Urban vs. Rural Households

A 100-bp contractionary monetary policy shock (interest rate increase): **Adversely affects rural household income more**

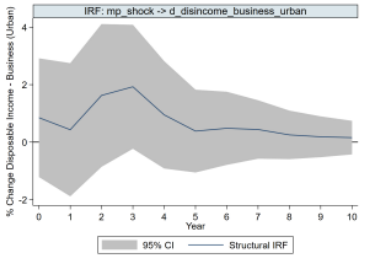
(a) Labor Income: Urban (p>0.1)



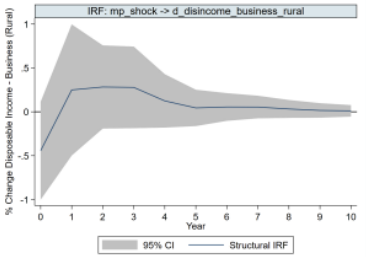
(b) Labor Income: Rural (p>0.1)



(c) Business Income: Urban (p>0.1)



(d) Business Income: Rural (p>0.1)



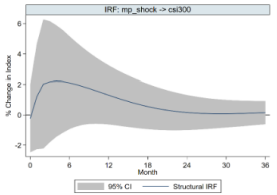
Results: Asset Market Returns

A 100-bp contractionary monetary policy shock (interest rate increase):

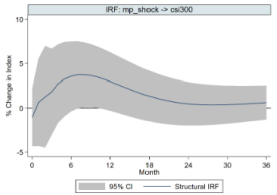
Affects asset market returns differently before and after complete interest rate liberalization in 2015

CSI 300 Index:

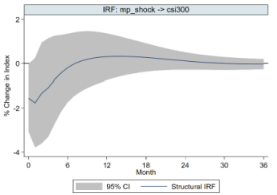
(a) 03/2006-12/2021



(b) 03/2006-12/2015

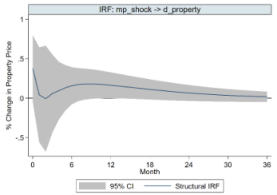


(c) 01/2016-12/2021

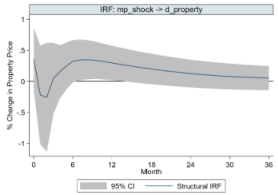


Residential Property Price Index:

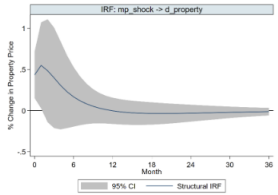
(a) 03/2006-12/2021



(b) 03/2006-12/2015



(c) 01/2016-12/2021



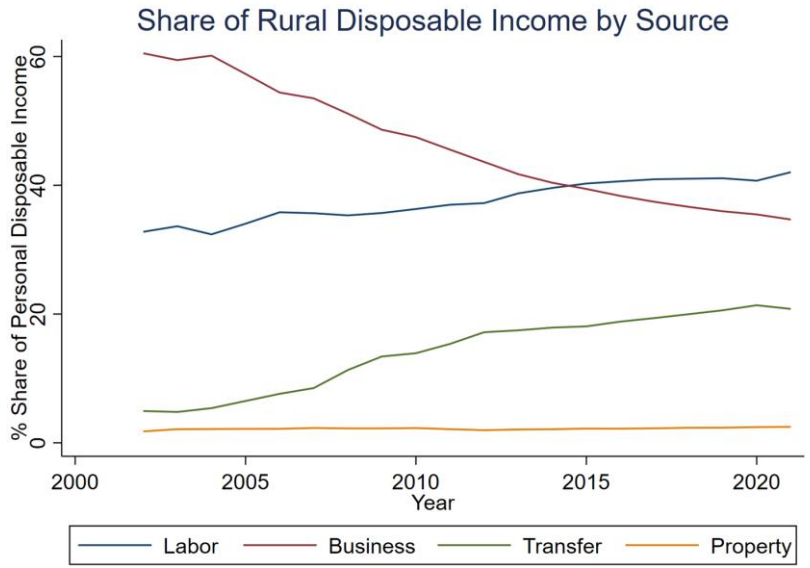
Conclusion

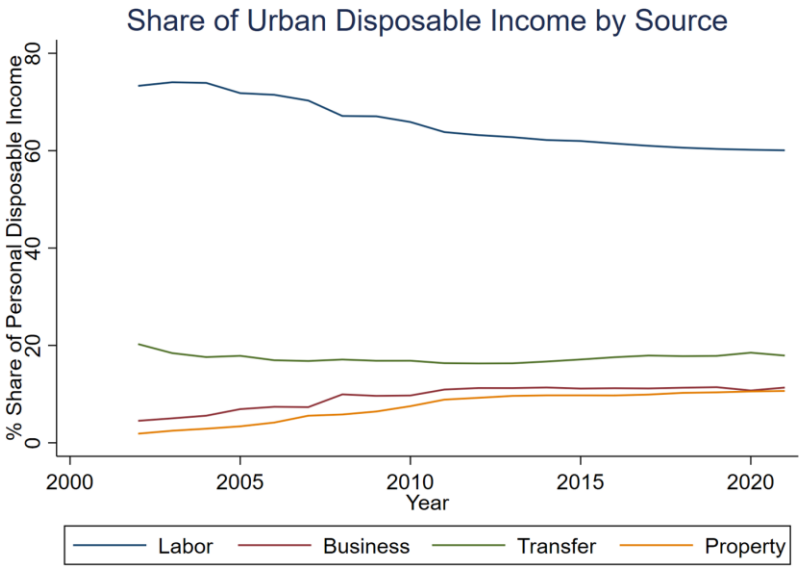
1. Do monetary policy shocks have an impact on income inequality in China? **Yes, contractionary shocks increase inequality by adversely affecting lower-income earners more**

2. Can they be explained by differences in income composition along the distribution? **Yes, the sensitivity of primary income sources and level of asset market participation differ along the income distribution**

Policy Implication #1: Income Composition

Consider changes in urban and rural household income composition



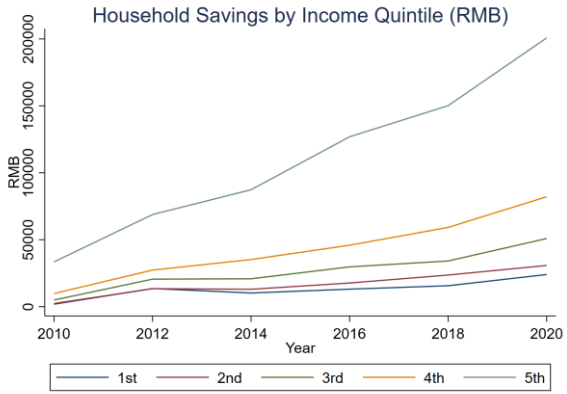


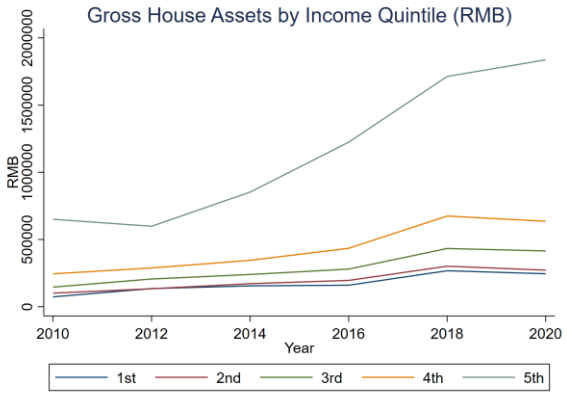
Policy Implication #1.1: Transfer Income

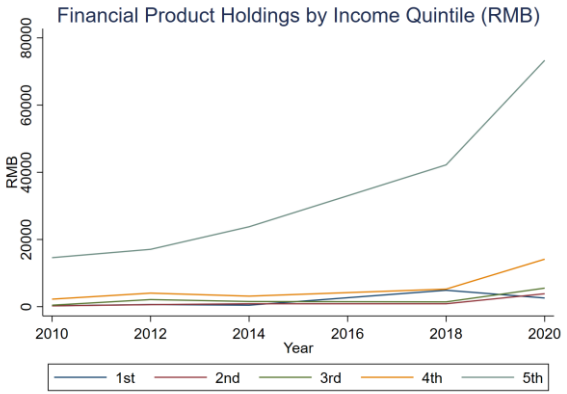
Strengthen social safety net through transfer income to mitigate negative shocks

Policy Implication #1.2: Asset Ownership

Understand household participation in asset markets along the distribution







Policy Implication #2: Transmission Efficiency

Monitor monetary policy transmission under an interest rate-based framework

Directions for Future Research

- Incorporation of time-varying parameters and structural models
- Use of more granular and longer time series data

- MP shock effects on household borrowing, savings, and consumption
- Relative effectiveness of different policy instruments
- Policy rate pass-through before vs. after interest rate liberalization
- Fiscal-monetary policy coordination

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Thank You!

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