Monetary Transmission under Heterogeneous Exchange Rate Exposure

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Outline

- Study the transmission of U.S. monetary shocks to firms in emerging market economies (EMEs) when firms have heterogeneous currency exposure.
- When the Fed tightens, **firms change the currency composition of debt** rather than deleverage.
- Firms with dollar debt reduce investment in capital as well as financial assets.
- These responses are driven by relatively **large firms.**

Introduction

- US monetary tightening increases corporate borrowing risk in EMEs due to currency mismatch on balance sheet.
- **Large firms** have better access to foreign currency debt (dollar debt) as they can tolerate default risk. cf. Maggiori et al. (2019), Salomao and Varela (2022)
- Large firms play an important role in business cycles. cf. Gabaix (2011)

Data

- **Sample firms:** non-financial firms headquartered in 15 countries
- **Period:** 2009Q4-2019Q3, quarterly data
- **Balance Sheets and Fundamentals:**
    - S&P Capital IQ: currency composition of debt
    - Thomson Reuters Worldscope, OECD I-O Table
- **US monetary shock:** identified by high-frequency method
  cf. Nakamura and Steinsson (2018)

Summary Statistics
- 4,457 firms (total), 1,006 firms (23%) issue dollar debt
- Large firms have both high leverage and dollar debt share.

Country	Number of Firms	Firm-quarter Observations	Country	Number of Firms	Firm-quarter Observations
Argentina	39	1,122	Peru	26	648
Brazil	137	3,319	Philippines	87	2,464
Chile	51	948	Poland	299	7,145
Colombia	25	4051	Russia	63	1,222
India	2,062	13,594	South Africa	121	2,056
Indonesia	224	4,850	Thailand	492	12,678
Malaysia	630	18,988	Turkey	156	3,688
Mexico	45	956	Total	4,457	74,083

Table 1. Sample Firms.

Firm Size (1 = small, 4 = large)	1	2	3	4
Total Debt over Total Asset (%)	21	22	29	29
Dollar Debt over Total Debt (%)	7	25	24	34

Table 2. Liability of Firms with Heterogeneous Sizes.

Regression

$$\theta_{i,t} = \alpha + \sum_{j=1}^{4} \beta^j Q_{it-1}^j + \gamma^j (FFR_t \times Q_{it-1}^j) + \gamma Z_{t-1} + \tau + \epsilon_{i,t}$$

- $\theta_{i,t}$: leverage or share of dollar debt of firm i in quarter t (%)
- FFR_t: Fed Funds Rate shock (bps)
- Q_{it-1}^j: firm size dummy ($1 \leq j \leq 4$), 1 = small, 4 = large

- $Z_{t-1} = (Z_{i,t-1}, Z_{ind,t-1}, Z_{c,t-1})$: controls
    - Firm-level (i): export, international sales, liquidity, age, sales growth
    - Industry-level (ind): import content of production
    - Country-level (c): change in spot exchange rate, share of dollar asset / total asset cf. Benetrix et al. (2020)

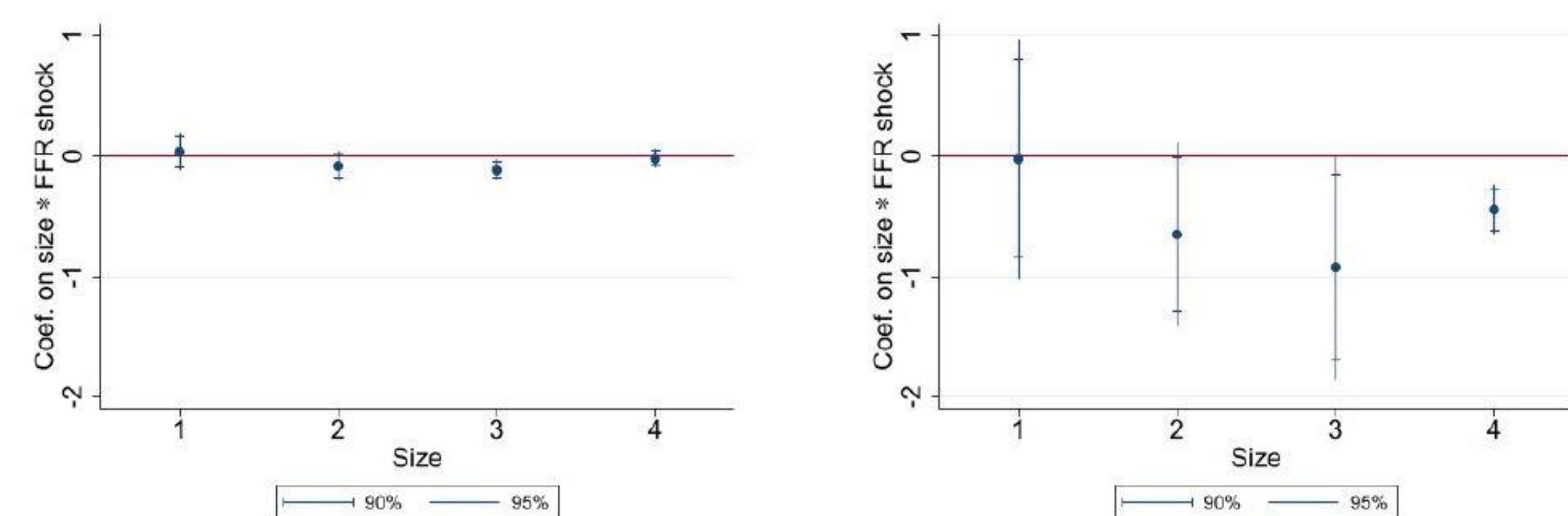- Industry and country FEs, SE is clustered at firm and quarter-levels

Results

(a) Liability Side

- When FFR increases, firms reduce the share of dollar debt more than the leverage.
- Firms are **switching currency composition of debt.**
- The response is driven by relatively **large firms.**

(a) Total Debt / Total Asset   (b) Dollar Debt / Total Debt

Figure 1. Response of Liability to FFR shocks.

(b) Asset Side

$$\Delta \log Y_{i,t} = \alpha + \sum_{j=1}^{4} \beta^j Q_{it-1}^j + \sum_{j=1}^{4}\sum_{s=0}^{2} \gamma_s^j \left(FFR_{t-s} \times Q_{it-1}^j\right) + \gamma Z_{t-1} + \tau + \epsilon_{i,t}$$

- $\Delta \log Y_{i,t}$: investment in capital and financial assets cf. Bruno and Shin (2017), Duchin et al. (2017)
- When FFR increases, large firms **reduce investment in capital** as well as **safe and risky financial assets.**
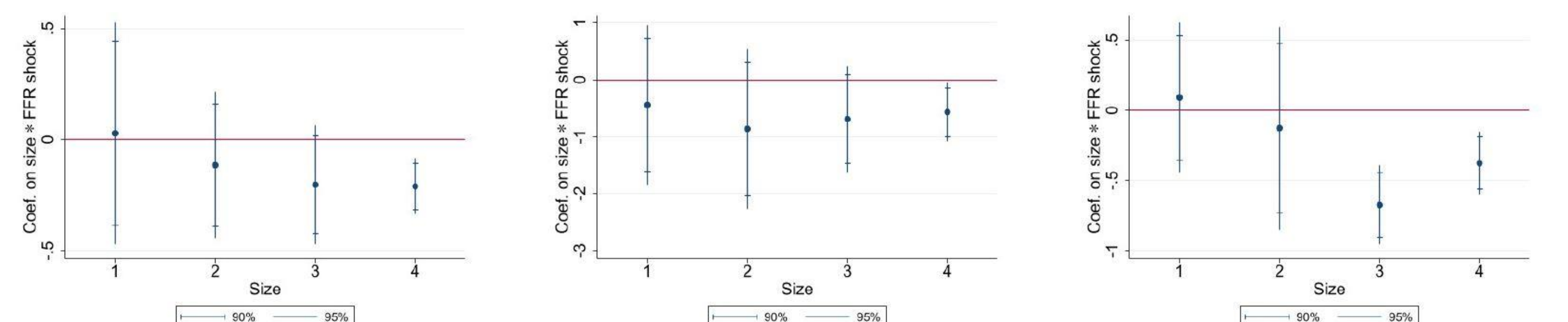
(a) Capital   (b) Cash   (c) Risky Financial Assets

Figure 2. Response of Asset to FFR shocks.

(c) Cross-Country Heterogeneity

- The response of large firms can be observed in countries with relatively **flexible exchange rate regimes.** cf. Ilzetzki et al. (2019)
    - 74% (26%) of firm-quarter observations are under flexible (fixed) regimes.

Conclusions

- In response to US monetary tightening, large firms reduce
    - The share of dollar debt over total debt
    - Investment in capital and financial assets
- Role of **firm size heterogeneity** and **currency composition** effects for transmission of monetary policy
- Future research: model with heterogeneous firm size, currency choice of debt, and nominal rigidity

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