

U.S. MONETARY POLICY SURPRISE AND FINANCIAL INSTITUTIONS' BEHAVIOR: DATA LESSONS FROM BANKS AND INSURANCE COMPANIES IN 72 COUNTRIES



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Key Results

I isolate the endogenous reactions of banks and insurance companies to 156 FOMC monetary policy announcements during 2000-2019. The discrepancy between the expected US monetary policy stance and the actual monetary policy decision reached by the FOMC forms **two empirical facts of banks' and insurance companies' behavior surrounding FOMC announcements**:

1. The impact of US monetary policy on banks' and insurers' balance sheet is largely attributed to the surprise jump in leverage ratio following the unexpected US monetary policy stance.
2. This surprise jump in leverage ratio leads to deviation from banks' and insurers' leverage target that are not necessarily the same as regulatory leverage ratio requirement, and are unique to each bank and insurer (their "shadow" leverage ratio target).

Empirical Approach

- Conduct daily local projection of banks and insurance companies' leverage ratio L_t surrounding FOMC announcement on day t (Jordà, 2005). The leverage ratio L_t is a ratio of equity to equity plus debt. One day after the announcement on day t , the cumulative change of leverage ratio, $\Delta L_{i,t}$ is estimated as below.

$$\begin{aligned} \Delta L_{i,t} &= \underbrace{\beta_{\sigma} \sigma_t}_{\text{Effect on UST yield}} + \underbrace{\beta_X \text{Ann. } X_{EX,t}}_{\text{Effect on exchange rate}} \\ &+ \underbrace{\beta_X \text{Postann. } X_{EX,t}}_{\text{Effect on exchange rate}} \\ &+ \underbrace{\alpha_i}_{\text{Fixed effect}} + \underbrace{\gamma_t}_{\text{Time effect}} + \underbrace{\epsilon_{i,t}}_{\text{Error term}} \end{aligned}$$

Balance sheet response from $t-1$ to $t+1$

Announcement Window from $t-1$ to t

Postannouncement Window from t to $t+1$

The cumulative change in leverage ratio $\Delta L_{i,t}$ of banks and insurers (indexed i) in response to an FOMC announcement on day t in the longer horizon is obtained by extending this specification.

- **Data.** A panel data set of the change in 500 banks' and 192 insurance companies' leverage ratio surrounding US FOMC (Federal Open Market Committee) announcements, combined with the corresponding US monetary policy shock extracted from the US Treasury yield curve and spot exchange rate from June 2000 to December 2019. The daily leverage ratio data is obtained from New York University Global Volatility Lab.

Construction of US Monetary Policy Shock

- σ_t is a 3×1 vector of innovations in the slope, curvature and level factors of the US Treasury yield curve in announcement window estimated using the approach in Diebold & Li (2006) and Diebold, Rudebusch & Aruoba (2006). Yield curve data: SVENY Fed.
- $X_{EX,t}$ is a 11×1 vector of principal component scores of the change in spot exchange rates of two groups of currencies in both announcement and postannouncement windows: 10 major currencies and the 12 remaining currencies in Fed H.10.

Two Empirical Facts

Fact 1. The impact of US monetary policy on banks and insurers' balance sheet is largely attributed to the surprise jump in leverage ratio following the unexpected outcome of US monetary policy. The table below shows that 1 standard deviation of US monetary policy shocks causes leverage ratios of banks in the 72 countries to move further from their level before the announcement: **by the end of day $t+1$ the impact of US announcement has not subsided yet as $\sum_{\text{Ann., Postann.}} \Delta L \neq 0$.** US monetary policy shock explains $\leq 20\%$ of the variation in the leverage ratio jump surrounding FOMC announcement.

Banks' Response to Unexpected US Monetary Policy Announced on Day t (in bps)

	Easing		Tightening	
	$L_t - L_{t-1}$ (End of Announcement Day t)	$L_{t+1} - L_t$ (A Day After)	$L_t - L_{t-1}$ (End of Announcement Day t)	$L_{t+1} - L_t$ (A Day After)
USA	34.24	22.10	-3.79	-7.95
Emerging	15.95	-5.05	-9.36	-15.89
Advanced	4.52	5.69	-1.49	-2.88
Other	7.44	8.34	-0.82	-4.35
AU, NZ and CA	8.49	13.50	-9.93	-9.84
Remaining	10.27	-3.53	-1.48	-6.68

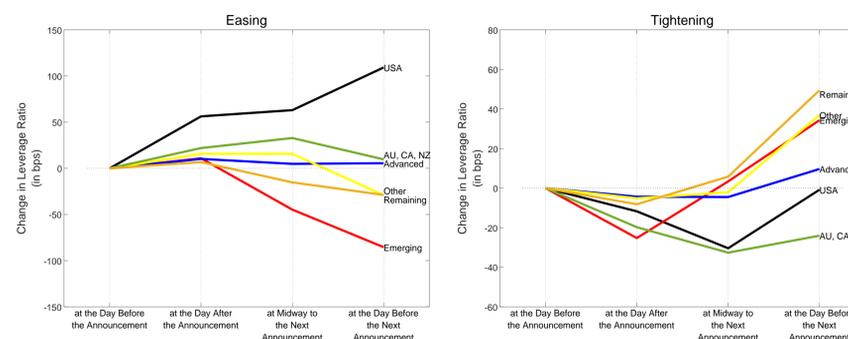
The case for insurance companies is the same, and in both cases emerging economies recorded the larger change in leverage ratio at the end of announcement day t . At the same time, leverage ratio of banks in emerging countries starts to revert back the previous level in postannouncement window after US monetary policy easing, albeit imperfectly. **The impact of US monetary policy shock is asymmetric, with heterogeneity in response captured more during easing, especially for banks.**

Insurers' Response to Unexpected US Monetary Policy Announced on Day t (in bps)

	Easing		Tightening	
	$\Delta L = L_t - L_{t-1}$ (End of Announcement Day t)	$\Delta L = L_{t+1} - L_t$ (A Day After)	$\Delta L = L_t - L_{t-1}$ (End of Announcement Day t)	$\Delta L = L_{t+1} - L_t$ (A Day After)
USA	40.70	13.21	-12.78	-8.71
Emerging	30.09	10.82	-26.13	-8.52
Advanced	9.05	3.78	-12.79	-2.74
Other	50.46	9.51	-2.91	-10.35
AU, NZ and CA	16.37	-5.91	-9.9	-7.63
Remaining	41.55	10.22	-42.17	9.71

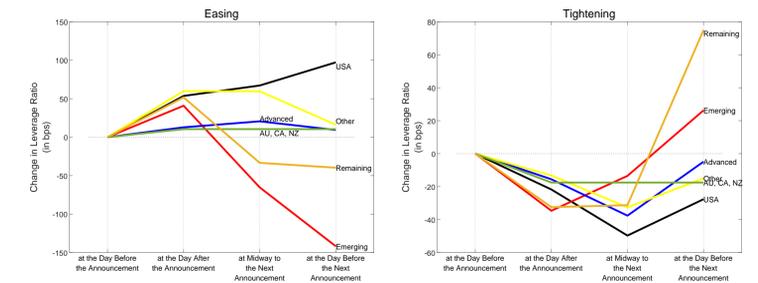
Fact 2. The surprise jump in leverage ratio due to unexpected US monetary policy outcome indicates behavioral reactions due to deviation from optimal leverage target that are not necessarily the same as regulatory leverage ratio requirement, and are unique to each entity. The two figures below show **the cumulative change in leverage ratios (or average response) at three points of times: a day after each announcement, midway through to next announcement and a day before each announcement.**

Banks' Response to Unexpected US Monetary Policy Decision in the Longer Horizon (in bps)



Two Empirical Facts

Insurers' Response to Unexpected US Monetary Policy Decision in the Longer Horizon (in bps)



Both Figures show that the "shadow" leverage target exists as banks and insurers seem to revert back to their initial leverage ratio right before the next FOMC announcement, albeit with little success. Local currencies in emerging economies have large interest rate differential with the USD, and therefore even when the leverage ratios of banks in these economies start to revert back quicker than in other regions, they are thrown off further in the longer horizon. As banks are highly leveraged (large portion of debt in leverage ratio), the local currency appreciation have more impact as net exposure is higher in emerging economies. Banks are leverage-driven business and heavily regulated unlike insurance companies, leading to the different magnitude of the impact of unexpected US monetary policy in the longer horizon.

* The same local projections using well-known monetary policy shocks in Kuttner (2000), Jarocinski & Karadi (2020) and Jarocinski (2020) and my data set show that the innovation in the yield curve latent factors works well as part of monetary policy shock in this paper, especially in the case of emerging economies. Additionally, including the FOMC announcement effect $X_{EX,t}$ on spot exchange rate movements to a certain extent controls for the information effect discussed in Gürkaynak, et al. (2020).

Paper Contribution and Work in Progress

The two empirical facts indicate a monetary policy transmission channel that impacts banks' and insurance companies' balance sheets through idiosyncratic exchange rate shock. This monetary transmission channel is orthogonal from other channels that have been identified so far, as it works through the accumulation of "burden" for not perfectly adjusting to each FOMC announcement.

In the continuation of this work, I argue that the impact of US monetary policy on overseas banks and insurance companies largely operates through the announcements of US monetary policy stance that drive a wedge between their optimal capital structure and their prevailing capital structure, affecting their capital structure decisions in the long run. The initial wedge is increasing in interest rate differentials: it is larger for banks and insurance companies headquartered in a country where the interest rate differential of their local currency with the US is large.

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