Threats To Central Bank Independence: High-Frequency Identification With Twitter

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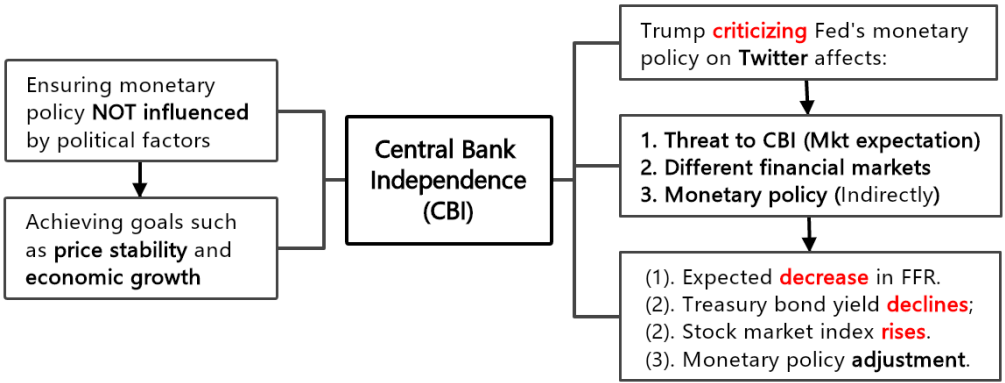
Framework


Ensuring monetary policy **NOT influenced** by political factors
Achieving goals such as **price stability** and **economic growth**
Central Bank Independence (CBI)
Trump **criticizing** Fed's monetary policy on **Twitter** affects:
1. Threat to CBI (Mkt expectation)
2. Different financial markets
3. Monetary policy (Indirectly)
(1). Expected **decrease** in FFR.
(2). Treasury bond yield **declines**;
(2). Stock market index **rises**.
(3). Monetary policy **adjustment**.

Motivation

Central Bank Independence(CBI): Considered key to economic stability.

The uniqueness of President Trump:

As the first president to frequently use tweets to directly pressure the Fed.

The impact of social media on the market:

- High frequency identification: Impact of the president's informal intervention on market.
- Twitter: Accurate timestamp (seconds), high frequency, immediacy, and wide impact.

Limitations of existing studies:

- Mainly focusing on FOMC meetings, but still no consensus on whether the president's informal intervention will affect the market.
- Typically uses daily or monthly data, lacking real-time response analysis of the market.

Research Questions

1. Has Trump's public criticism of the Fed through social media affected market expectations for future interest rates?

- If the Fed were completely independent, the market won't be influenced by Trump's tweets.

2. How do tweets affect federal funds futures rates, bond yields, and the stock market?

3. Does changes in market expectations affect Fed's monetary policy decisions?

- The Fed considers market expectations when making monetary policy decisions, and tweets indirectly influence policy.

Contributions

1. Literature on identifying monetary policy shocks using high-frequency data

Prior: Using high-frequency futures prices to measure expectations for FFR. (Gilchrist 2019)

Extend: Including Trump's tweet urging the Fed to lower interest rates as a news component.

2. Literature on constructing an index to measure CBI in various countries

Prior: Explored the impact of independence on macroeconomic outcomes. (Binder, 2021)

Extend: Use high-frequency data information to identify threats to the CBI.

3. Literature on impact of informal FOMC communication on stock market

Prior: Cieslak et al., (2018) studied the returns within the FOMC cycle.

Extend: Presidential pressure affects expected policy decisions in future FOMC meetings.

Hypothesis

H1: Trump's tweets will lead to a decrease in market expectations for future FFR.

- i.e., the expectation that the Fed will be more inclined to cut interest rates.

H2: Tweets will lead to a decrease in bond yields and an increase in the stock market.

- Reflecting market expectations for a looser monetary policy.

H3: After Trump's tweet impacting market expectations, the Fed will adjust its policy.

- Indirectly influencing the policy decisions.

Research Data

1. **Trump tweets related to Fed**: During 2015/06 ~ 2021/01, release time(to seconds).
2. **Federal Fund Futures (FFF) data**: Reflect the market's expectations for future FFR.
3. **US Treasury futures data**, **Stock market data**:

- The market's expectations for changes in long-term interest rates, stock market performance.

Core Event window:

- Time window [-0.1 , +5] minutes before/after the tweet.

Extended window:

- The market's sustained response to tweets from 4 hrs before to 2 hrs after the tweet.
- Further expand to one day after the tweet is published.

Regression Model

Classify FFF contracts based on number of times exposed to FOMC meetings:

- Contracts exposed to 1-4 meetings (short-term); 11-12 meetings (long-term).

Dependent Variable

Expected change in market interest rates within event window: $(E_t - E_{t-\Delta t})[r_j]$

Regression Model

$$(E_t - E_{t-\Delta t})[r_j] = \alpha_j + \epsilon_j$$

LHS: From $t - \Delta t$ to t, market's expectation of changes in interest rates exposed to the j^th FOMC meeting.

RHS: α_j: On average, how many *bps* does each tweet lead to a decrease in market expectations for future interest rates.

H1: Tweets lead to a decrease in market expectations for FFR

Table 1: **FFF and EDF Contracts by Horizon**

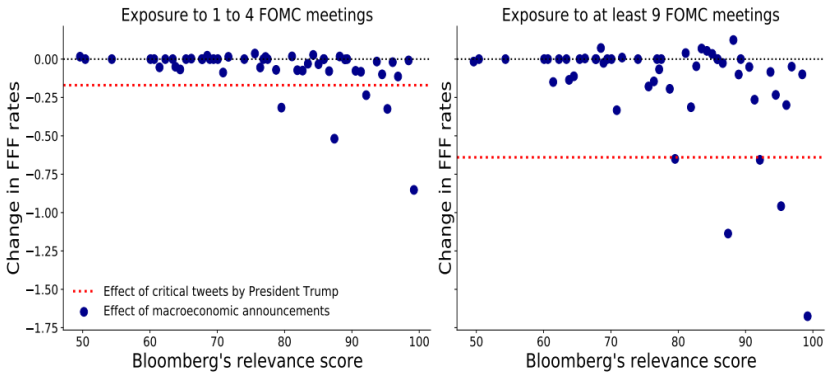
Panel A: FFF						
		Exposure to FOMC Meetings				
	All	0	1–4	5–8	9–10	11-12
	(1)	(2)	(3)	(4)	(5)	(6)
Regression Const. α	-0.26	0.02	-0.16	-0.27	-0.31	-0.64
$t-stat$	[-7.88]	[0.91]	[-5.99]	[-5.56]	[-4.33]	[-3.07]
Observations	647	31	235	238	97	46

Table 2: **FFF and EDF Contracts by Horizon: Daily event window**

Panel A: FFF						
		Exposure to FOMC Meetings				
	All	0	1–4	5–8	9–10	11-12
	(1)	(2)	(3)	(4)	(5)	(6)
Regression Const. α	-2.15	-0.01	-1.88	-2.12	-2.65	-2.86
$t-stat$	[-2.72]	[-0.13]	[-2.29]	[-2.61]	[-3.67]	[-2.59]
Observations	637	20	179	181	71	51

H1(further): Importance of Trump's tweets

Figure 3: **Effect of Macro Announcements on Interest Rate Expectations**



Only 5 macro-indicators have a greater impact on interest rate expectations than tweets.

H2: Tweets lead to a decrease in bond yields and increase in stock market

Table 4: **Estimated effects of Trump tweets on Bonds and Stocks**

Panel A: Effects of Trump tweets on U.S. Treasury Futures				
	(1)	(2)	(3)	(4)
	2-Year	5-Year	10-Year	30-Year
α	-0.34	-0.38	-2.11	-1.21
	[-1.42]	[-2.67]	[-1.89]	[-4.34]
Panel B: Effects of Trump tweets Criticizing QE Policies on U.S. Treasury Futures				
	2-Year	5-Year	10-Year	30-Year
α	-0.20	-0.35	-1.39	-0.95
	[-1.36]	[-2.91]	[-1.84]	[-4.28]
β_{QE}	0.74	-0.15	-4.60	-3.23
	[-1.07]	[-0.34]	[-1.82]	[-2.89]
Panel C: Effects of Trump tweets on Stocks				
	High freq.	Daily freq.		
	(1)	(2)		
α	0.28	1.71		
	[1.40]	[1.92]		

H3: Tweets indirectly influence the Fed's policy decisions

Table 5: **Change in FFF Pricing Errors around Trump tweets**

		Exposure to FOMC Meetings				
	All	0	1–4	5–8	9–10	11-12
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: High frequency						
Regression Const. α	-1.75	0.02	-0.46	-1.85	-2.26	-6.22
$t-stat$	[-2.53]	[1.14]	[-0.98]	[-2.05]	[-2.22]	[-2.64]
Observations	636	30	230	234	96	46
Panel B: Daily frequency						
Regression Const. α	-18.00	0.00	-17.53	-17.22	-26.61	-22.75
$t-stat$	[-5.47]	[0.21]	[-2.10]	[-4.72]	[-4.01]	[-2.69]
Observations	459	17	164	165	66	47

$$(E_t - E_{t-\Delta t})|FE_j t| = \alpha_j + \epsilon_j$$

Market does not believe that the Fed is independent can affect the actions of the Fed.

研究局限性与未来展望

局限性:

(1). 个案研究局限：仅分析特朗普推文，是否适用于其他领导人?

- 改进方向：扩展至不同国家央行的政治干预案例。

(2). 长期政策影响未直接测量：研究未测量美联储内部决策过程。

- 改进方向：分析 FOMC 会议纪要，观察政治压力是否影响央行沟通策略。

未来研究方向:

(1). 扩展至其他国家的领导人，尤其是其他形式的政治干预（例如政府公开讲话或其他社交媒体平台上的言论）对市场预期的影响，验证不同领导人对央行的公开批评是否也能引发类似的市场反应。

(2). 为了直接测量美联储的决策过程，未来可以分析美联储 FOMC 会议纪要和决策者的公开言论，了解是否有证据表明推文对美联储决策产生了实际影响，或者美联储是否调整了政策路径来应对市场的预期变化。