Twitter and the Federal Reserve: How the U.S. central bank is (and is not) surviving social media

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ABSTRACT

In the last generation, the Federal Reserve launched a "quiet revolution" in how it approaches communication. Most of the tools that the Fed uses to communicate, however, have remained relatively static and indifferent to rapid technological change: speeches, congressional testimony, press conferences and select interviews, and the like. This white paper undertakes the first systematic analysis of the Fed's participation on Twitter, a medium of increasing importance to public policy discussions. We also analyze how President Donald Trump, one of the most prolific users of the medium, has influenced conversations about the Fed on Twitter.

Using several large datasets—including a dataset containing one percent of all tweets published worldwide—we reach several novel conclusions. Most prominently, we find that the Fed's Board of Governors is more engaged on Twitter than other independent agencies, but less than executive departments; that other Twitter users engage the Fed more negatively than they do other central banks and federal agencies; that President Trump amplified the conversation on Twitter regarding the Fed; and that the President's tweets criticizing the Fed elicited a larger, more favorable response than his other tweets. We conclude with suggestions on improving the Fed's presence on Twitter, particularly at the Federal Reserve Regional Banks, and discuss the ways that political conversations on Twitter may influence Fed communication strategies.

Introduction

Since 1994, the Federal Reserve has launched—or, in many cases, been shoved into—an era of more open communication. Before 1994, the Fed would not even publish the results of its interest-rate decisions, leaving the news to percolate through market activity. Central bankers cultivated an aura of mystique, focused on opacity in communication. Fed Chairman Alan Greenspan nurtured this image with particular enthusiasm. "If I turn out to be particularly clear," he famously said in 1988, "you've probably misunderstood what I said."[1]

At the behest of Congress and nudged by other central banks' practices, the Fed changed: not only does it now release the details of its decisions, the Fed holds a press conference after every such meeting, releases a Summary of Economic Projections that contains projections of key economic indicators from the participants on the Federal Open Market Committee, makes FOMC members available for interviews with reporters, and engages in a variety of other once unheard-of mechanisms to ensure greater transparency and clarity. When the Fed recently reevaluated its monetary policy framework, it did so only after fourteen meetings convened as part of a campaign the central bank called "Fed Listens." These changes, once called a "quiet revolution" by former central banker and prominent advocate for greater Fed transparency Alan Blinder, have become rather noisy.[2]

In the Trump era, conversations about the Fed became noisier, still. On April 16, 2018, Donald Trump tweeted his first critique of the Federal Reserve's monetary policy as President: that, while other countries are "playing the Currency Devaluation game," the U.S. "keeps raising interest rates," which is "Not acceptable!"[3]. Dozens of critical tweets—many directly aimed personally at Fed Chair Jerome Powell—would follow. "As usual, Powell let us down," Trump tweeted a few months later.[4] Powell made "TWO enormous mistakes,"[5] he is "clueless,"[6] exhibits a "horrendous lack of vision."[7] By August 2019, Trump asked "who is our bigger enemy, Jay Powell or Chairman Xi?"[8]

Many viewed these tweets as an affront to the norms of central bank independence, an effort to politicize the work of the Fed for partisan political ends. But did these critical tweets from the President matter?

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1. Floyd Norris, What if the Fed Chief Speaks Plainly, N.Y. Times, Oct. 28, 2005, https://www.nytimes.com/2005/10/28/business/what-if-the-fed-chief-speaks-plainly.html

2. Alan S. Blinder, The Quiet Revolution: Central Banking Goes Modern (2004).

3. https://twitter.com/realdonaldtrump/status/985858100149309441?lang=en

4. https://twitter.com/realdonaldtrump/status/1156666164732473345?lang=en

5. https://twitter.com/realdonaldtrump/status/1161687635426983937?lang=en

6. https://twitter.com/realdonaldtrump/status/1161719409804808193?lang=en

7. https://twitter.com/realdonaldtrump/status/1163472272612626433?lang=en

8. https://twitter.com/realdonaldtrump/status/1164914610836783104

This paper seeks to connect these two discussions—about the Fed's efforts to increase its communications and the president's use of Twitter to attack the Fed's monetary policy decisions—by focusing on how the Fed uses Twitter, a relatively new and surprisingly powerful medium on which officials communicate directly with citizens, reporters break news, and ordinary people across the globe engage in direct conversation with each other. While other scholars have assessed the impact of Twitter on interest rates,[9] and central bank communications have become a growing area of other scholarly concern,[10] this is the first effort of which we are aware to document how the Fed uses Twitter and how Twitter users—especially President Trump—engage the Fed.

The effort produces three key findings. First, we identify patterns of usage among Federal Reserve entities and compare these patterns to those at other agencies and central banks. We learn that the Fed's Reserve Banks are more prolific users of Twitter than the Fed's Board of Governors (Board), but the Board has higher engagement with Twitter users. The Fed, as a whole, is also an average Twitter user compared to other central banks, more active than other independent agencies, but less than executive departments.

Second, Twitter users don't generally like the Fed. That is, although Twitter users discuss the Fed about as much as other major federal regulatory agencies, that discussion is likely more negative (using the Twitter "ratio" as a loose proxy for negativity).

And third, President Trump's Twitter campaign against the Fed has been good for the President's Twitter account and bad for the Federal Reserve. The President's tweets amplify discussions about the Fed on Twitter. More importantly, President Trump's Fed tweets generate a larger and more favorable response from Twitter users than do his other tweets.

The paper concludes with a discussion on the implications of these findings, including ways that the Fed can use Twitter more effectively to keep pace with its efforts to enhance its communications with the public.

The Fed on Twitter: An overview

To assess the extent to which the Fed uses Twitter, we downloaded all tweets sent from the main accounts of the Board of Governors of the Federal Reserve and the 12 regional Reserve Banks—140,153 tweets from mid-2008 through the end of 2019. For comparison, we also downloaded 336,746 tweets from select cabinet departments, independent financial

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9.   Peter TIllmann, *Trump, Twitter and Treasuries*, 38 Contemp. Econ. Pol'y 403 (2020); Francesco Bianchi, Howard Kung, & Thilo Kind, *Threats to Central Bank Independence: High-Frequency Identification with Twitter*, NBER Working Paper No. 26308, Sept. 2019.

10.   Danae Kyriakopoulou & Pierre Ortlieb, *Central banks take on social media*, OMFIF Global Public Investor 2019; Annette Vissing-Jorgensen, *Central Banking with Many Voices: The Communications Arms Race.* Paper presented at XXIII Annual Conference of the Central Bank of Chile, Santiago, Chile. http://faculty.haas.berkeley.edu/vissing/cacophony.pdf

regulatory agencies, and foreign central banks. We exclude individual central bankers who have developed their own approach to Twitter, a topic to which we return below.

Figure 1 displays the average number of tweets published per month by the Board (left panel) and each of the Reserve Banks (right panel) from 2008 through 2019. Lowess regression curves illustrate the time trend in Twitter activity. The left panel also includes the median number of tweets per Reserve Bank account. As the figure shows, the Board and most Reserve Banks tweet at a broadly similar rate—with the New York, Richmond, and San Francisco banks being outliers.

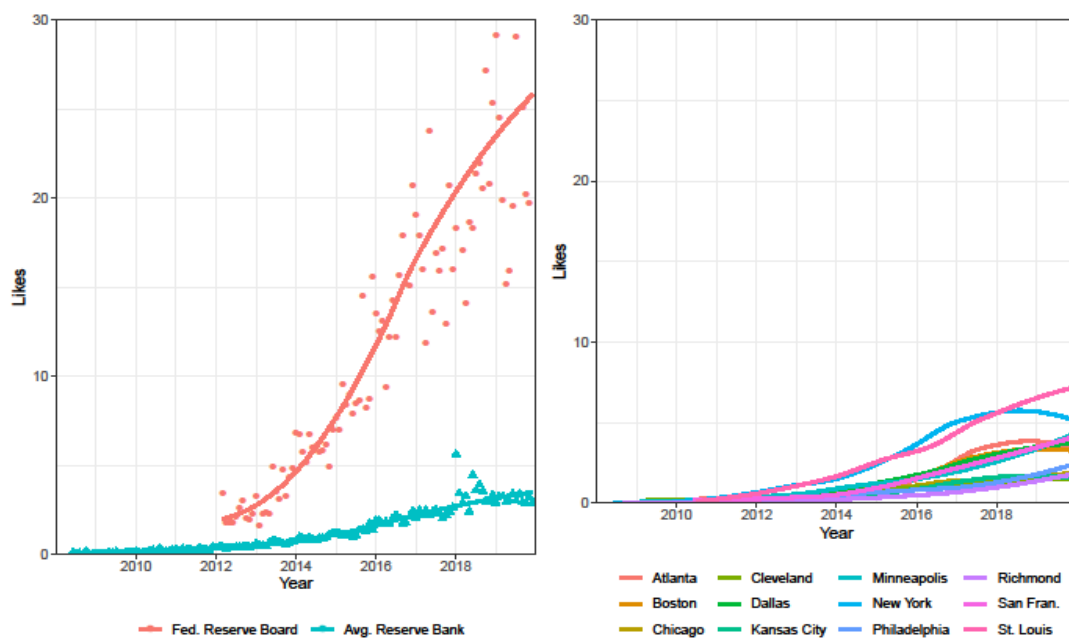## Figure 1: Tweets from Federal Reserve accounts
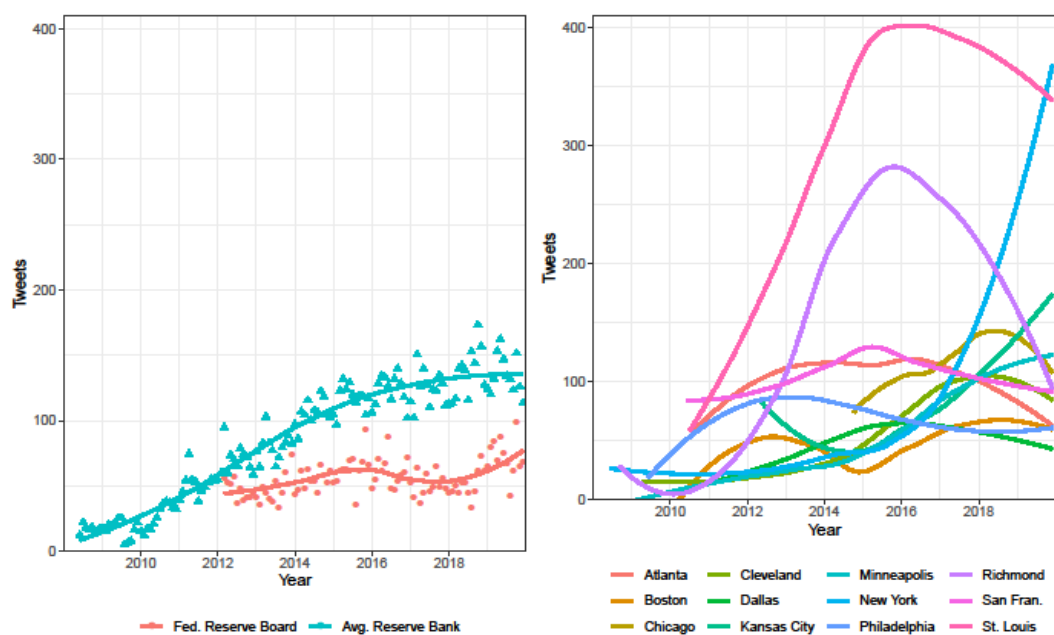
Although the Reserve Banks tend to be prolific tweeters, their ability to draw other Twitter users into a conversation is low. Figures 2-4 display monthly averages for retweets, likes, and replies, respectively. These figures show that, even though the average Reserve Bank tweets more frequently than the Board, public engagement with the Board's tweets is much higher. Board tweets elicit more replies, retweets, and likes than Reserve Bank tweets, and this gap generally is growing over time.
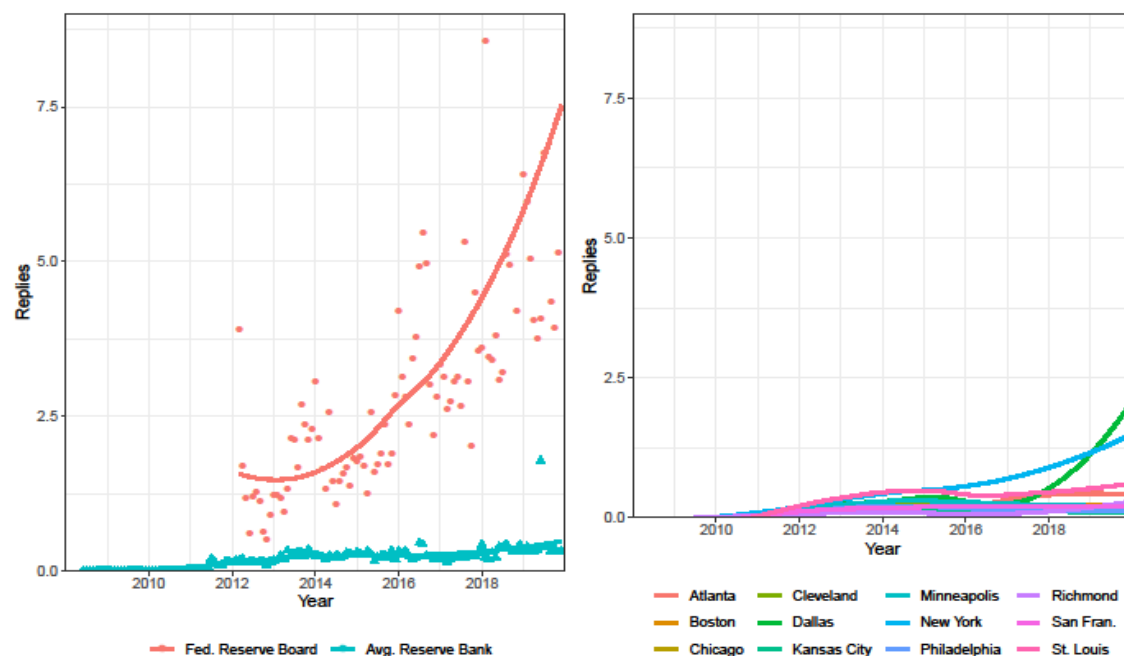
Figure 2: Mean Retweets of Federal Reserve Accounts
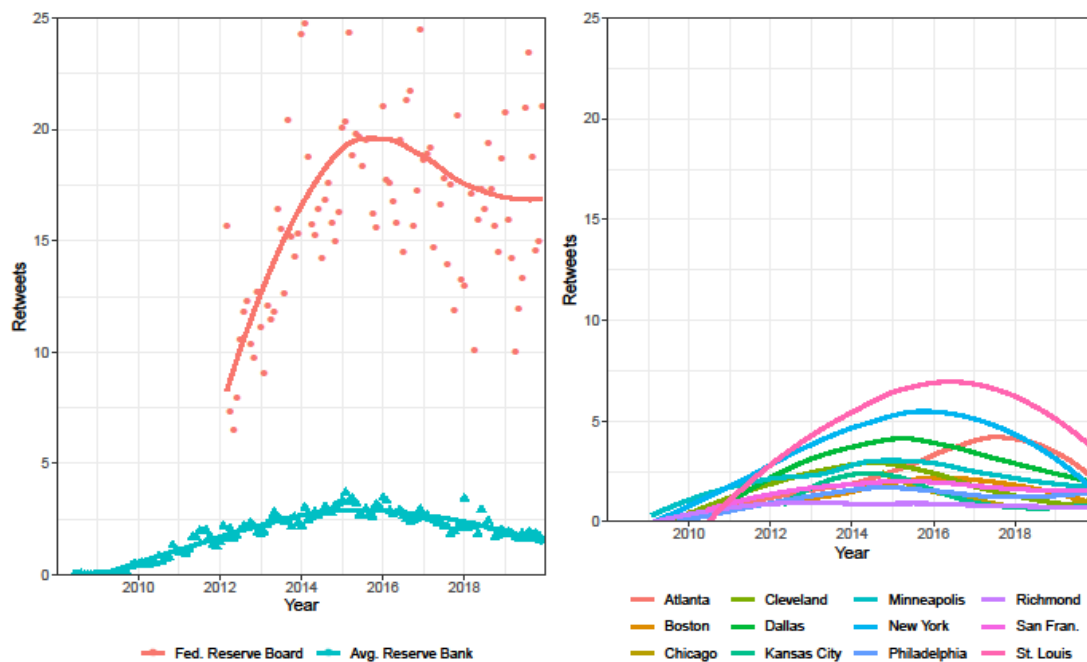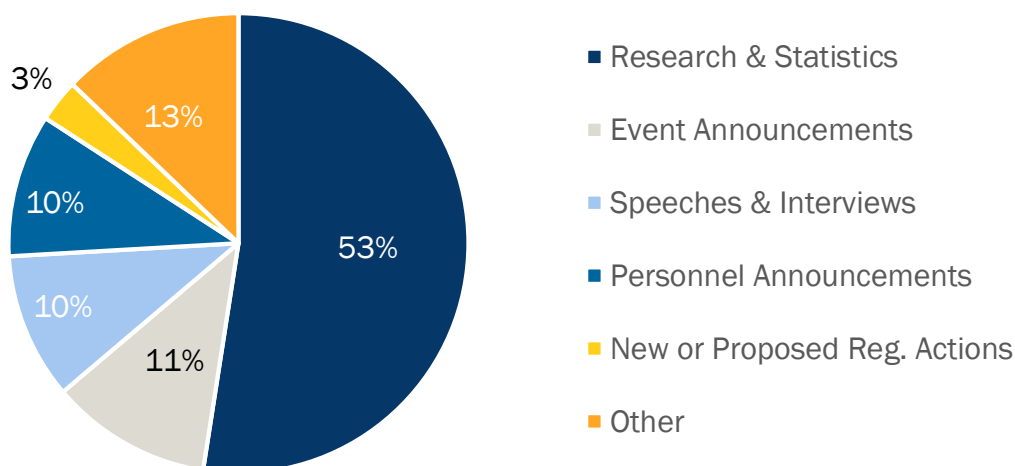

Figure 3: Mean likes for Federal Reserve accounts

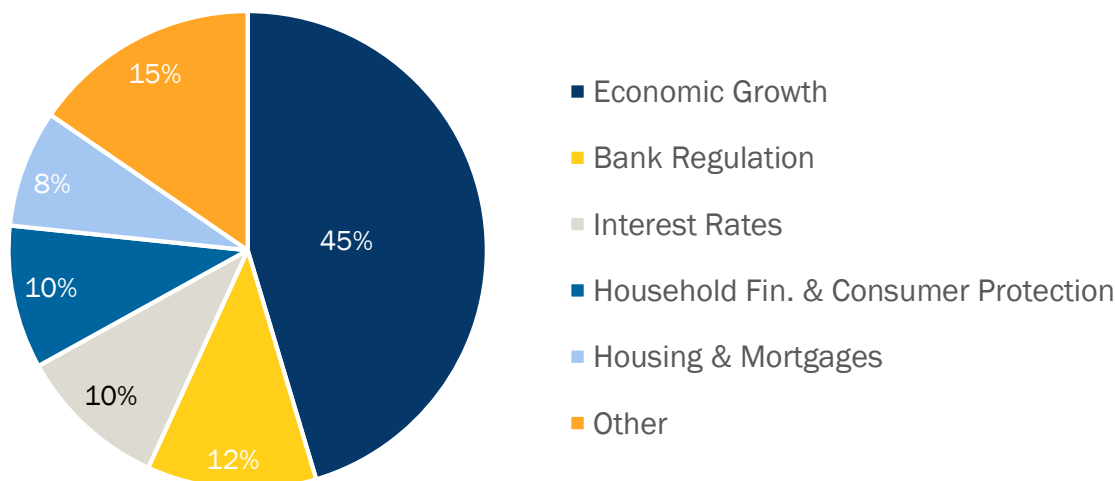## Figure 4: Mean replies to Federal Reserve accounts

Figures 5 and 6 show the most common subjects and functions of Board tweets. Notably, tweets directly concerning interest rates and bank regulation, which are central to the Board's role, are in the minority. Most tweets serve the purpose of disseminating research and statistics; in terms of subject matter, a plurality of tweets concern economic growth. This focus is consistent with a growing conception of the Fed as an economic research arm of the federal government. The Board's approach is consistent with a view of the medium as dissemination: nearly all of the Board's tweets are links to press releases, data releases, speeches, or events of Fed officials, rather than any attempt at conversation.

Figure 6 further shows that tweets announcing regulatory actions—i.e., decisions with a direct, real-world impact that are made pursuant to the Fed's legal authority—constitute a small fraction of the Board's activities on Twitter. In other words, the Fed's use of Twitter serves primarily discursive functions in disseminating research rather than administrative functions of explaining its use of its legislative authority.

Figure 5: Subject matter of Board tweets

- Research & Statistics
- Event Announcements
- Speeches & Interviews
- Personnel Announcements
- New or Proposed Reg. Actions
- Other

Figure 6: Function of Board tweets

- Economic Growth
- Bank Regulation
- Interest Rates
- Household Fin. & Consumer Protection
- Housing & Mortgages
- Other

The Fed's engagement on Twitter

How does the Fed's engagement on Twitter compare with that of other institutions? And how do Twitter's users receive the Fed's messages? Compared to other governmental entities, the Fed's activity on Twitter falls in the middle of the pack; it tends to be more engaged than other independent agencies, less active than executive departments, and approximately as active as major foreign central banks.

Twitter users' reactions to the Fed's tweets, however, are far from typical. Using the ratio of replies-to-likes—a common metric of negative sentiment on Twitter—we find that users react more negatively to the Fed's tweets than to messages by its peer institutions.

The Board is generally less engaged on Twitter than cabinet-level departments, but more engaged than other independent agencies.

This section compares the Board's engagement on Twitter with sixteen executive departments; six financial- and securities-related independent regulatory agencies; and five other independent regulatory agencies.[11] As Figure 7 shows, the Board tweets less than the average executive department—and, for the middle years of the 2010-2019 period, markedly less. Instead, its activity on Twitter is comparable to the average financial or securities regulator.

The typical Reserve Bank, in contrast, tweets markedly more than the Board of Governors. The Reserve Banks' activity level on Twitter is comparable to the non-finance-related independent agencies in our sample. Late in the series, the Reserve Banks even overtake executive departments' activity.

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11. The sixteen cabinet-level departments are the departments of Agriculture, Commerce, Defense, Education, Energy, Health & Human Services, Homeland Security, Interior, Justice, Labor, State, Transportation, Treasury, and Veterans Affairs, the Environmental Protection Agency, and the Small Business Administration. The six financial- and securities-related independent regulatory agencies are the Commodity Futures Trading Commission, Consumer Financial Protection Bureau, Federal Deposit Insurance Corporation, National Credit Union Administration, Office of Comptroller of the Currency, and Securities and Exchange Commission. The five other independent agencies are the Consumer Products Safety Commission, Federal Communications Commission, Federal Elections Commission, Federal Trade Commission, and National Labor Relations Board.

## Figure 7: Tweets from the Board and mean tweets from other agencies
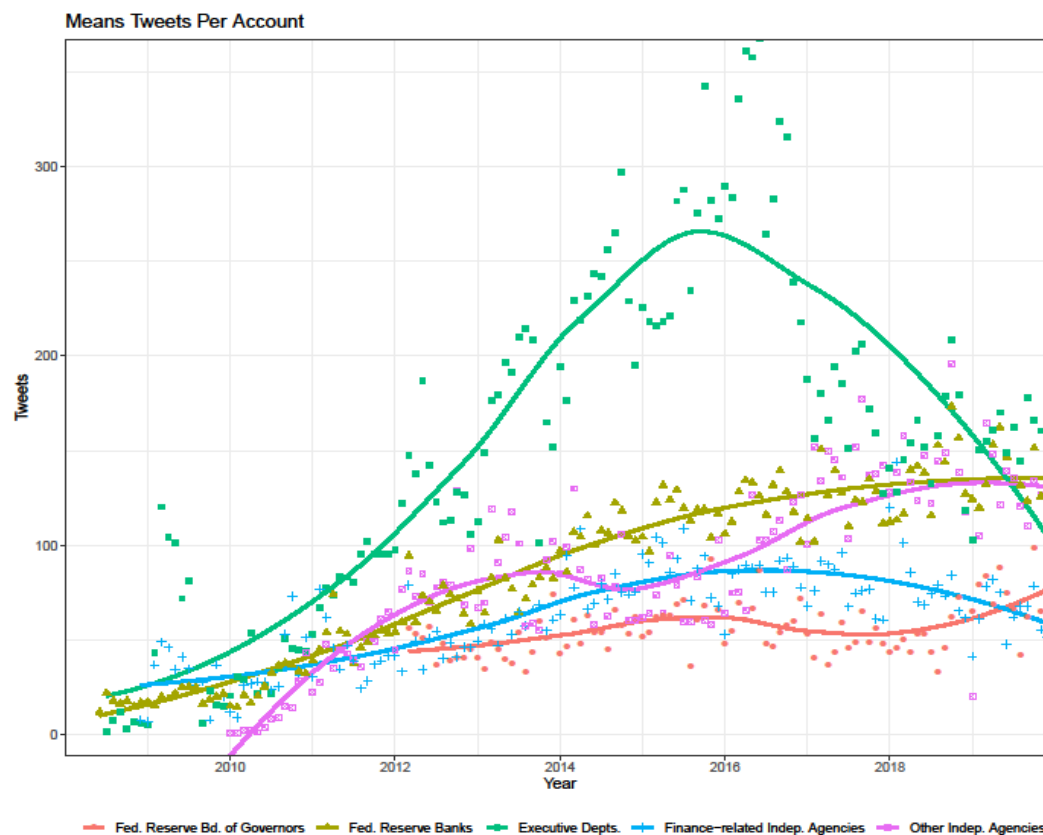
When the Board of Governors does tweet, its messages elicit fewer positive responses than do executive departments' tweets. Figures 5 and 6 display two key measures of positive reactions: mean retweets and mean likes per tweet, respectively. Taken together, the figures show that, when the Board of Governors does tweet, its messages elicit substantially fewer positive responses than executive departments' tweets. (Twitter users are more likely to respond positively to the Board of Governors than to the Reserve Banks and other independent agencies, however.)

Figure 8: Mean retweets of the Board and other agencies
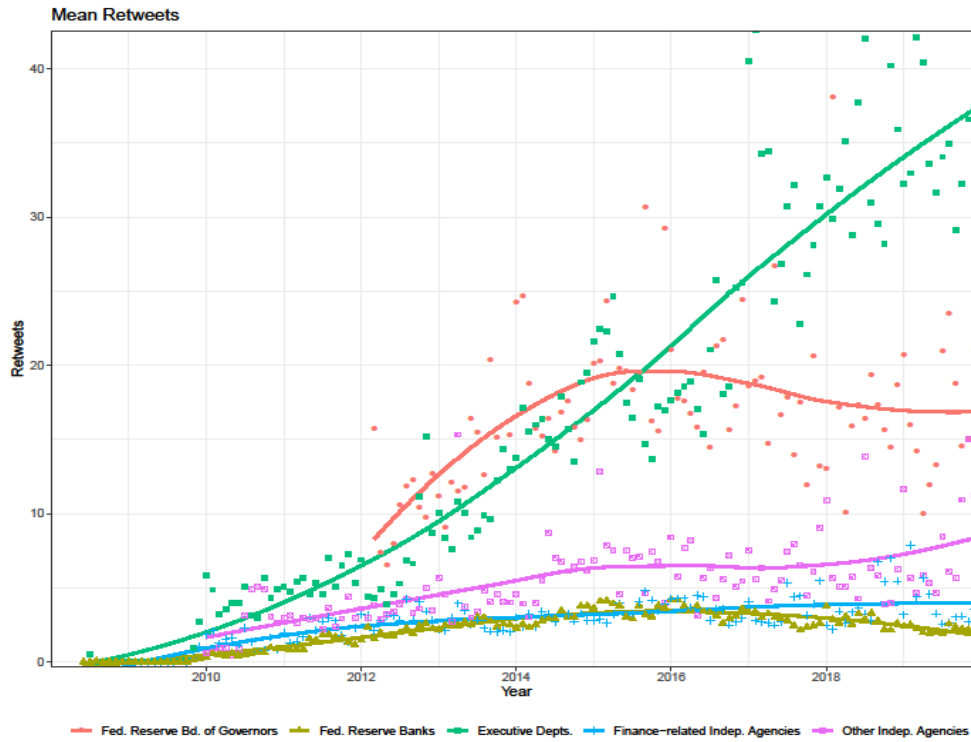
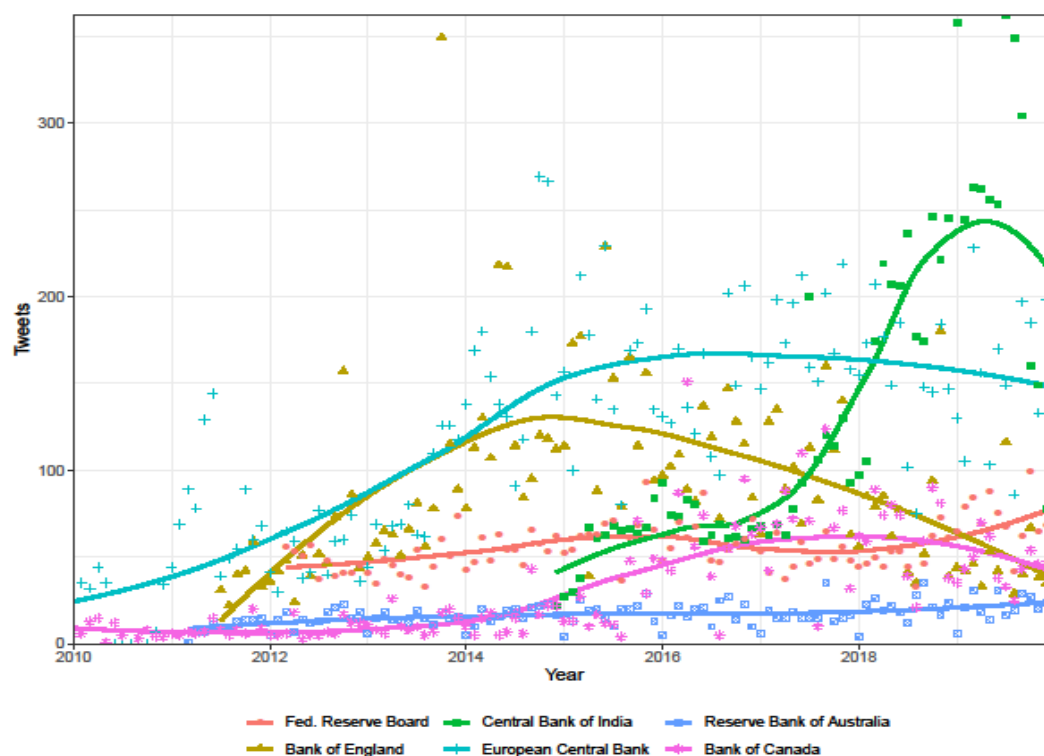
Figure 9: Mean likes for the Board and other agencies
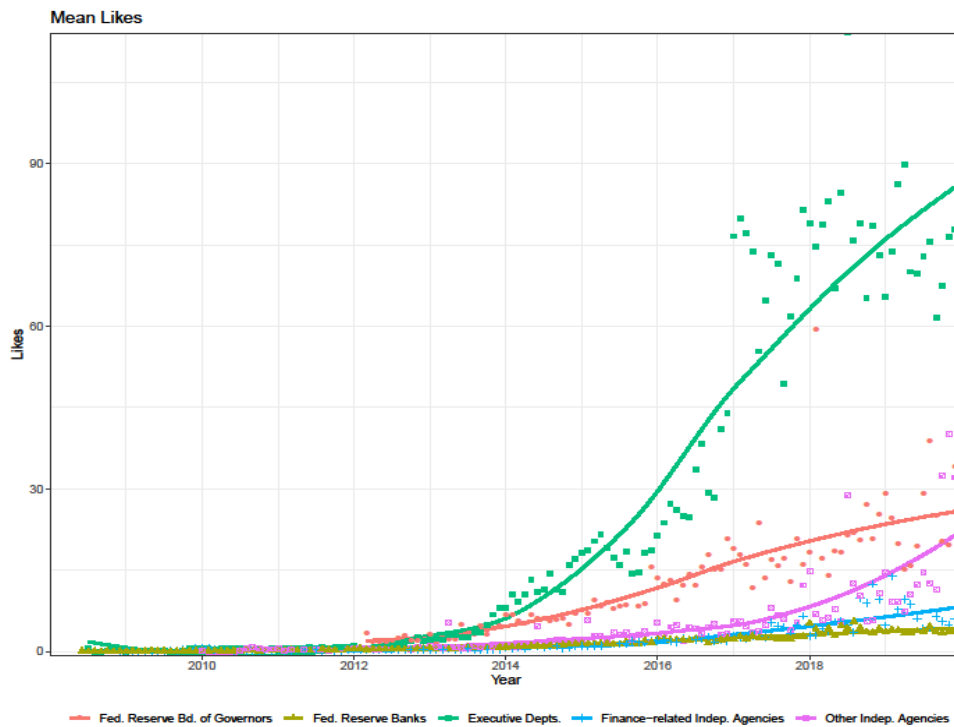
The Board's engagement on Twitter is similar to other central banks.

Figures 10-12 report the same information as above concerning the Board and five foreign central banks: The Bank of Canada, Bank of England, Central Bank of India, European Central Bank, and Reserve Bank of Australia. These metrics place the Board in the middle of the pack concerning these peer institutions over the last two years.

The Fed appears to be even more of a laggard when one considers the levels of Twitter usage by jurisdiction. A plurality of Twitter users in 2020—63 million—reside in the United States. By comparison, 41 million users reside in Japan, 35 million in European Union countries, 6 million in Canada.[12]

Figure 10: Tweets from the Board and other central banks

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12. https://www.statista.com/statistics/242606/number-of-active-twitter-users-in-selected-countries/. E.U. figure includes the United Kingdom.

Figure 11: Mean retweets of the Board and other central banks
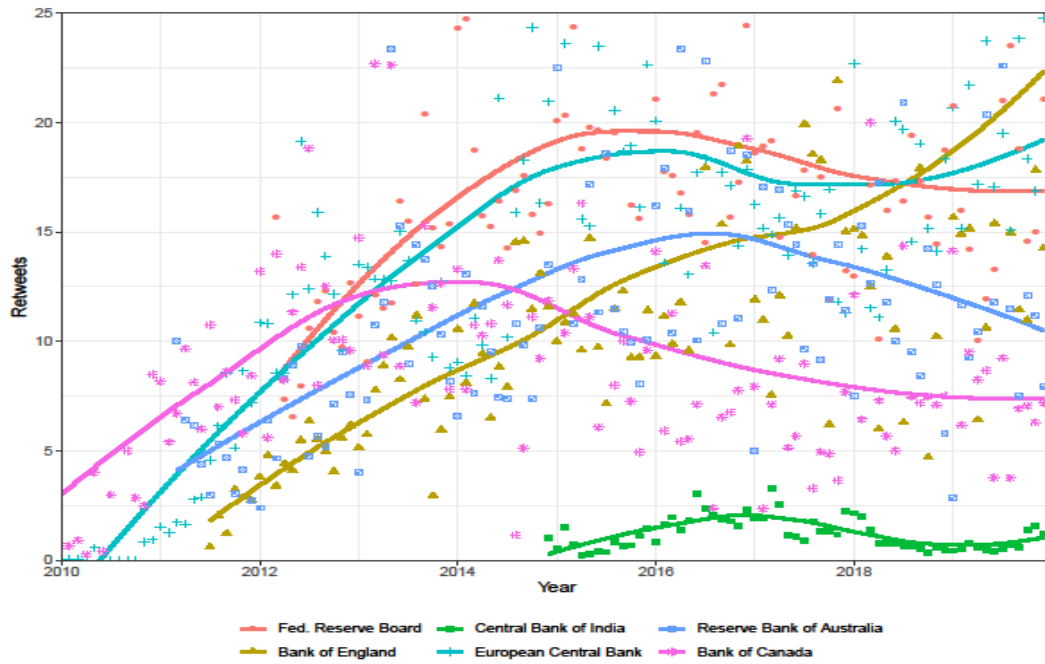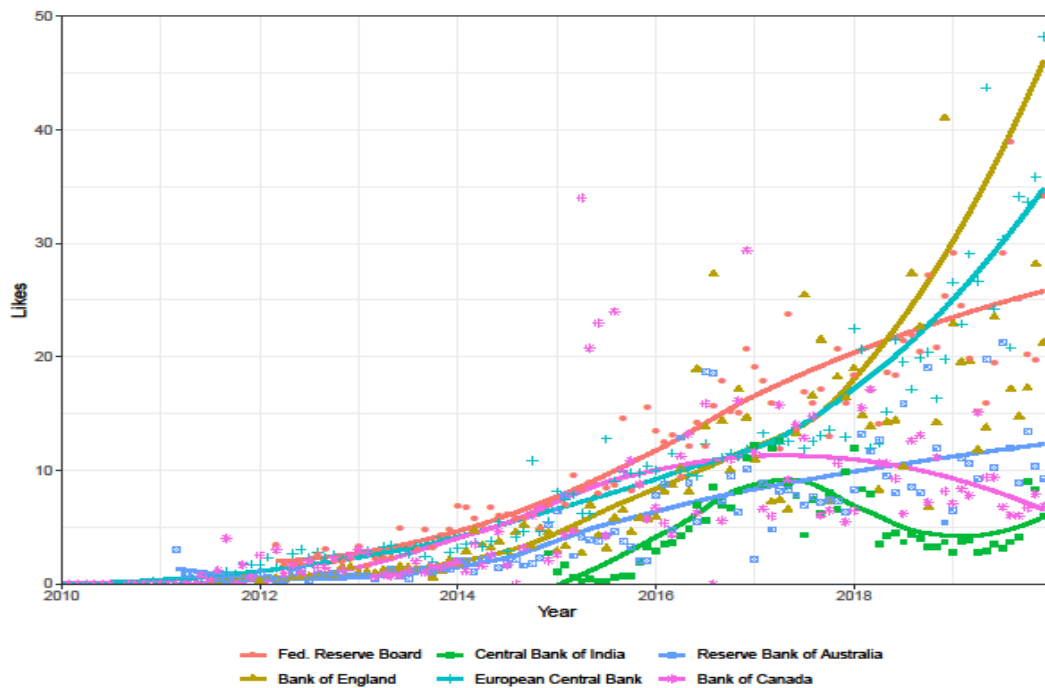

**Figure 12: Mean likes for the Board and other central banks**

Twitter users discuss the Fed more than other central banks, around the same amount as other major federal regulatory agencies.

To gauge Twitter users' discussion of the Fed—not limited to replies to tweets from a Fed account—we utilized the University of Pennsylvania's [Dataset of Historical Tweets](#). This database collects the text and metadata for a randomly selected 1% of all tweets worldwide since April 2012—over eight terabytes of data.

Figure 13 reports estimates of monthly totals of how frequently all Twitter users mention the Board and other central banks' Twitter handles.[13] The figure shows a steady increase in Twitter users' mentions of the Board's Twitter handle.

Figure 13: Twitter users' monthly mentions of the Board
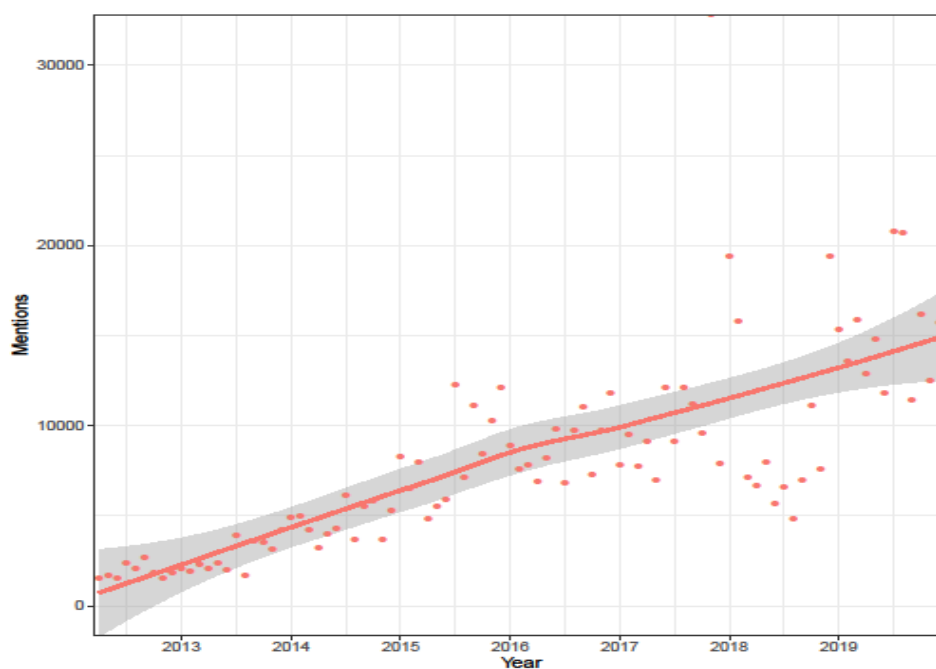
Figures 14 and 15 compare annual mentions for the Board with that information for, respectively, other central banks and several other U.S. agencies involving in financial or securities regulation.[14]

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13. Because the dataset's 1% sample is drawn randomly, we assume that the sample is representative and thus multiple by 100 to obtain an estimate of the total number of tweets for each data point. Although these annual figures may appear large, to put them in perspective, note that President Trump was mentioned 78,700 times in one largely uneventful *hour* in mid-2019.

14. These entities are the Treasury Department, Securities and Exchange Commission, and Consumer Financial Protection Bureau. Although the CFPB technically is an independent bureau of the Federal Reserve, it operates essentially as a distinct entity.

Figure 14: Twitter users' mentions of the Board and other central banks
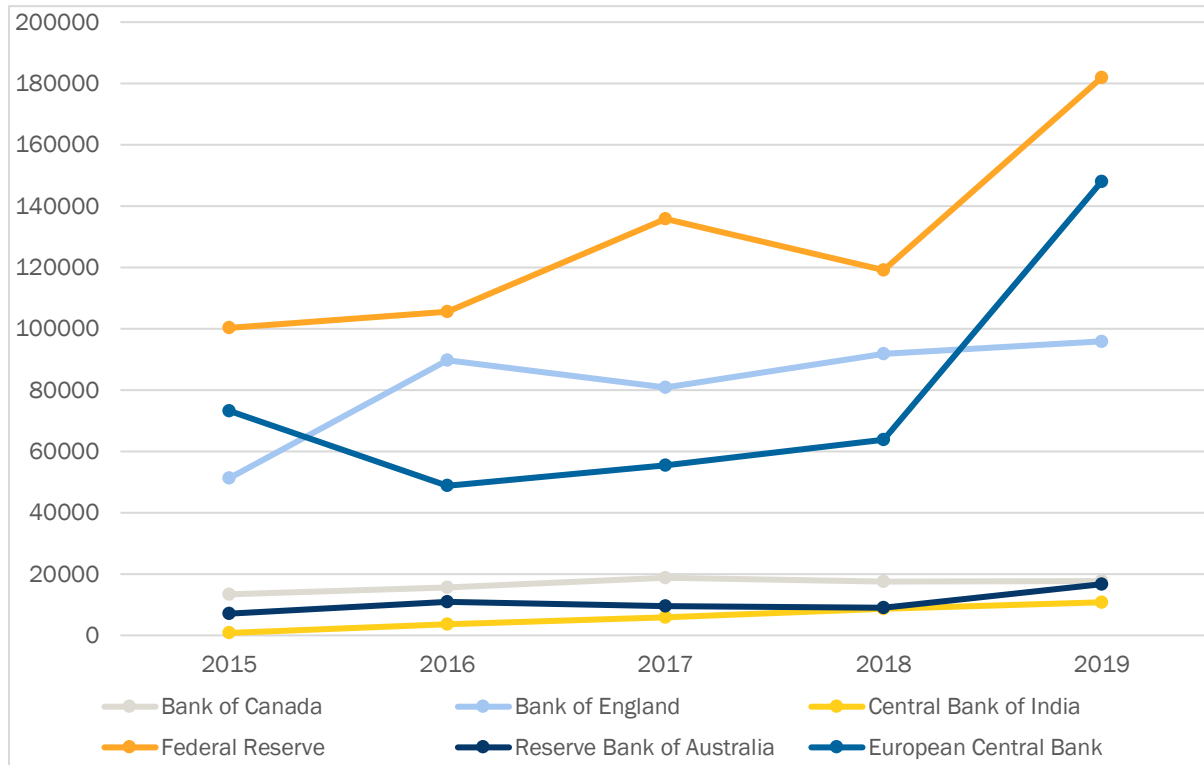
Figure 15: Twitter users' mentions of the Board and other central banks

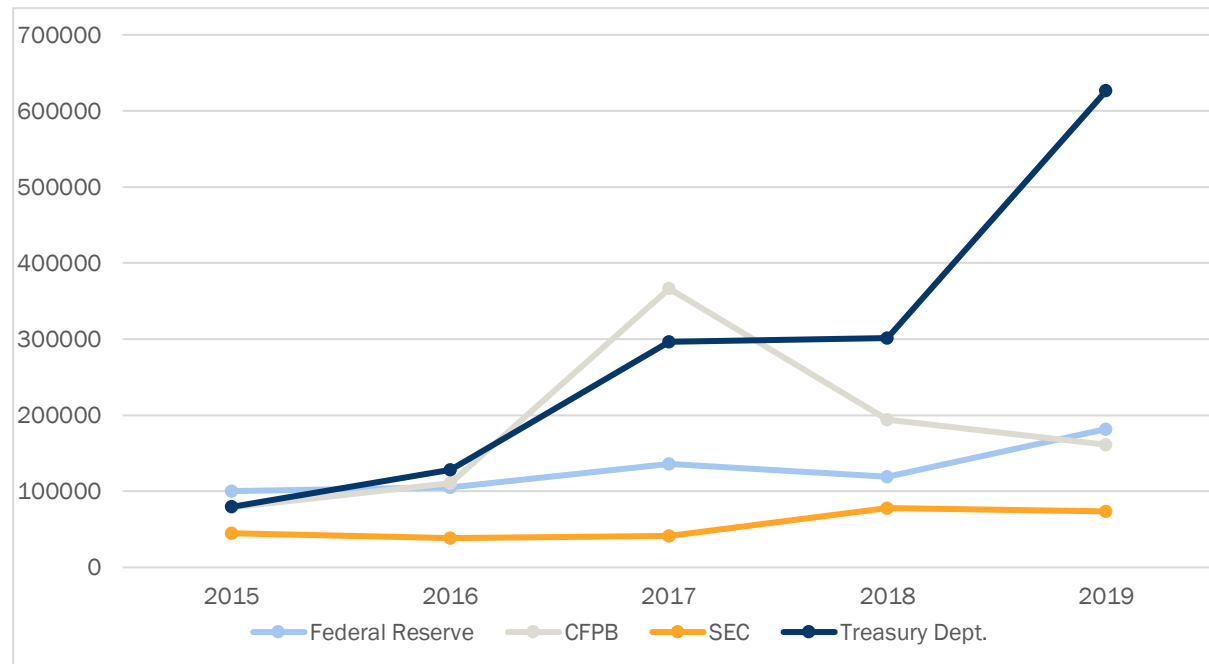# The Board of Governors garner greater negative reactions than do other federal agencies and peer nations' central banks.

The ratio of replies-to-likes that a tweet receives is are commonly considered to be a measure of negative sentiment.[15] The folk theory here is that replies often express disagreement with a tweet, whereas "liking" a tweet conveys agreement.[16] Hence, a tweet that provided more replies than likes has gotten "ratioed," evincing a net negative response.

Figure 16 shows that, among the included categories of federal agencies, the Board of Governors has a higher replies-to-likes ratio during most of the period under study.

Figure 16: Mean ratio of replies to likes, the Board and other agencies

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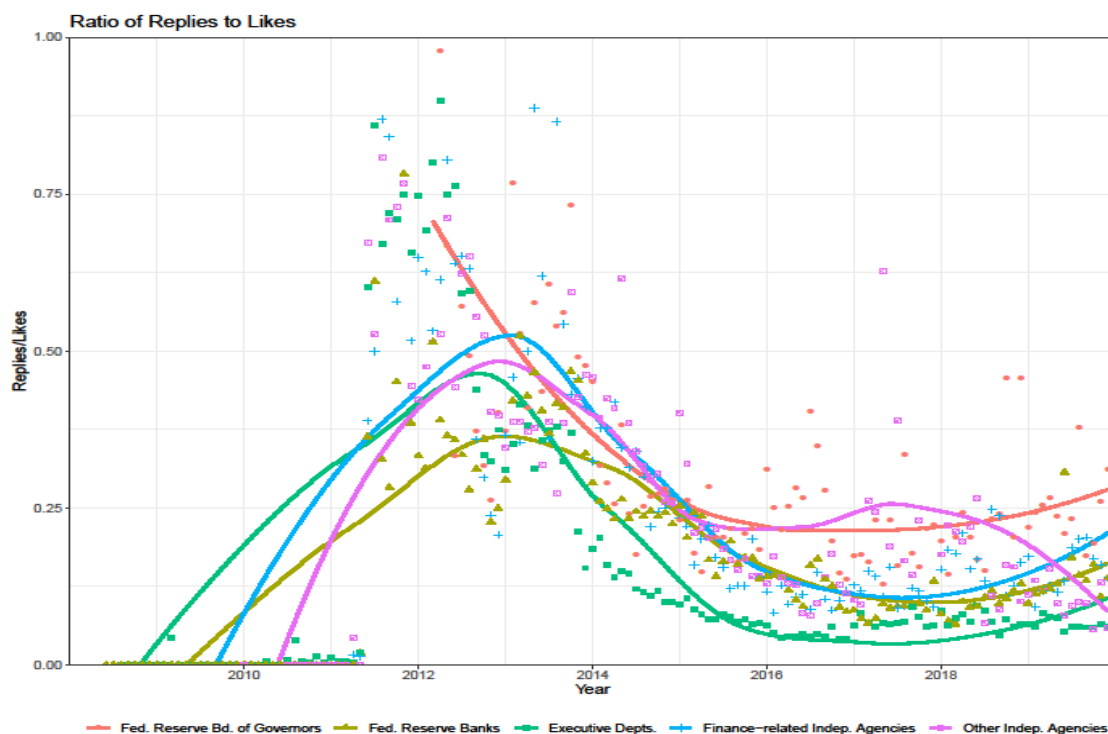
15. Merriam-Webster, "Words We're Watching: Ratio", available at https://www.merriam-webster.com/words-at-play/words-were-watching-ratio-ratioed-ratioing

16. Mike Isaac, The Ratio Establishes Itself on Twitter, N.Y. Times, Feb. 9, 2019. Consider, for instance, that President Trump's tweet with the highest ratio as of mid-2017 was a highly personal insult of a cable-news host (https://twitter.com/realDonaldTrump/status/880410114456465411), whereas his tweet with the lowest ratio mentioned that 2012 Republican presidential nominee Mitt Romney congratulated him on his 2016 victory (https://twitter.com/realDonaldTrump/status/797812630312382464).

Similarly, tweets from Board of Governors tend to generate a larger negative reaction than those from key foreign central banks, again as measured using the replies-to-likes ratio.

Figure 17: Mean ratio of replies to likes, the Board and other central banks
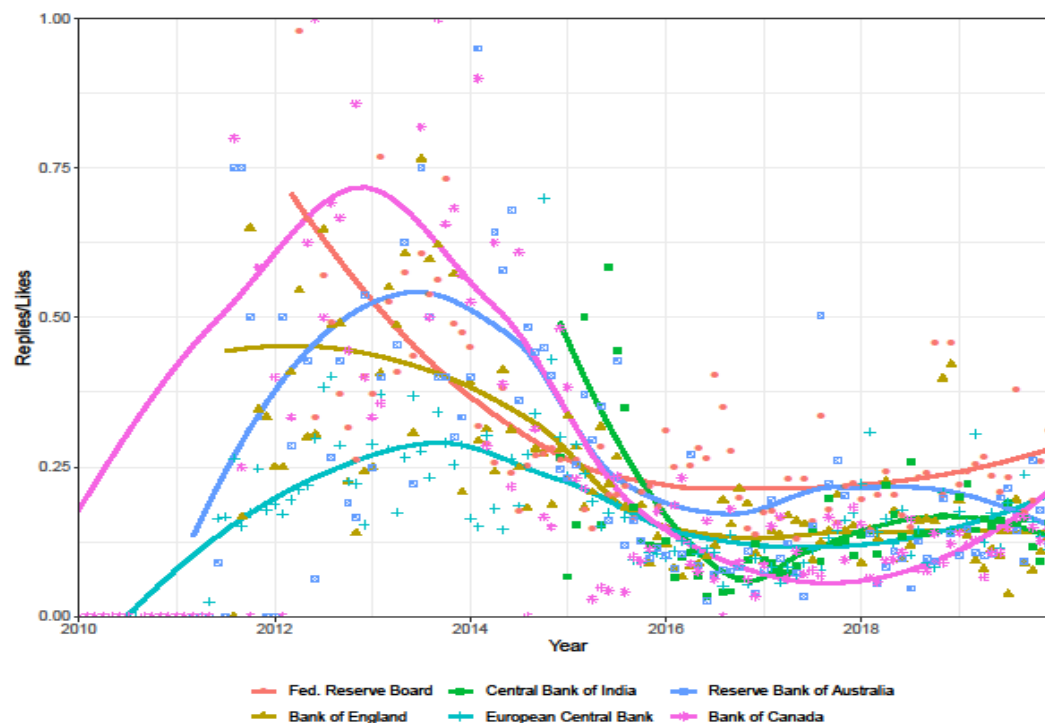
The Trump effect

President Trump amplifies the conversation on Twitter regarding the Fed.

Beginning in mid-2018, President Trump has periodically used Twitter to criticize the Fed for maintaining higher interest rate than the President prefers. Often, these tweets include invective directed at Chair Jay Powell, ranging from the anodyne ("He's like a golfer who can't putt"[17]) to the extreme ("who is our bigger enemy, Jay Powell or Chairman Xi?"[18]). In

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17. https://twitter.com/realdonaldtrump/status/1164158321265451008

18. https://twitter.com/realdonaldtrump/status/1164914610836783104

all, President Trump published tweets that were critical of Powell or the Fed on 42 days in 2018 and 2019.[19]

To what extent do President Trump's tweets drive the conversation about the Fed on Twitter? As a first-cut answer to this question, Figure 18 reports the estimated number of times that Twitter users mention the Fed for each day during the period in which President Trump leveled these critiques.[20] Red dots represent users' mentions of the Fed each day; dashed blue lines mark the dates on which President Trump tweets about the Fed.

Figure 18: Twitter users' daily mentions of the Board
July 2018 – Oct. 2019
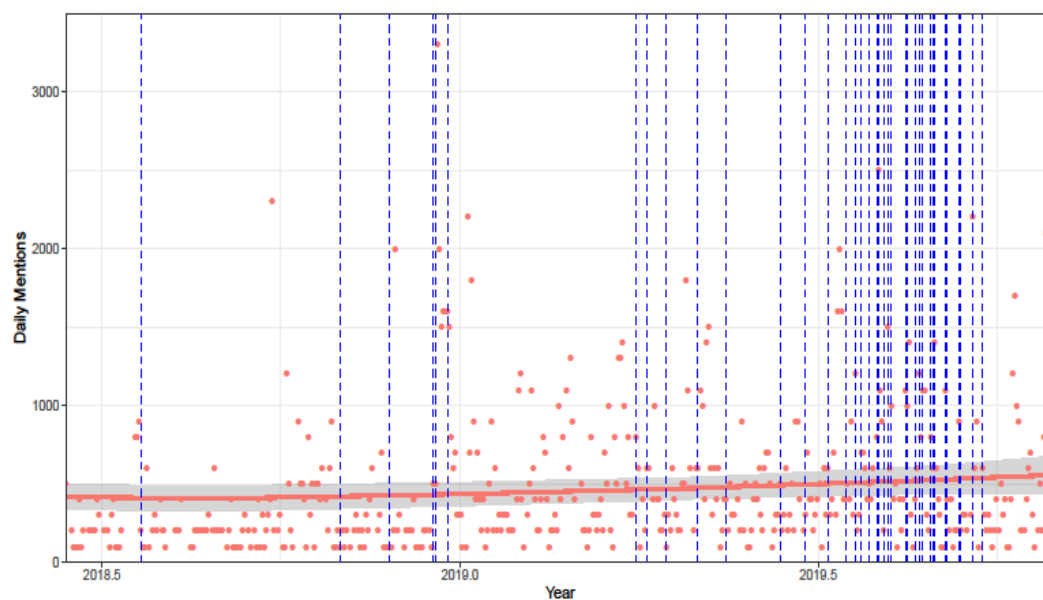
Although it is difficult to discern a clear signal from the noise, the figure does suggest that many of the spikes in Twitter discussion of the Board occur on days on which President Trump weighs in. To dig deeper, we conclude a simple regression of Twitter users' daily mentions of the Board on whether President Trump tweeted about it on that date. To account for the time-trend in Twitter mentions of the Board, we run model specifications with (i) a running "days" covariate (with January 1, 2018 set to zero); (ii) a year fixed effect; and (iii) month-year fixed effects. Table 1 reports the results.

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19. Trump also published a tweet regarding a "very good and cordial" meeting with Powell on November 18, 2019. https://twitter.com/realdonaldtrump/status/1196458467982270464.

20. These estimates were obtained via searches of the University of Pennsylvania's Dataset of Historical Tweets, which contains 1% of the worldwide corpus of tweets. We multiplied the number of results obtained via these searches by 100.

Table 1

	Model 1	Model 2	Model 3
Trump Tweet	302.87 *** (73.64)	297.28 *** (72.83)	261.70 *** (75.59)
Time (days)	0.17 * (0.09)	—	—
Fixed Effects?	No	Year	Month-Year

DV: Tweets per days that mention the Fed; Unit of Analysis: days, 2018-2019. Model: OLS. R^2: 0.04 (Model 1), 0.05 (Model 2). Observations: 730, *** signifies $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$. Parentheses report standard errors.

All three models show a statistically significant spike in Twitter posts about the Board on days on which President Trump tweets about the Board. Model 1, for instance, reports that an estimated additional 303 Board-related tweets published those days. Considering that the mean number of daily Board-related tweets during this period is 464, a Trump tweet induces a substantial 65 percent increase in tweeting.

President Trump's tweets critiquing the Fed elicit a larger, more favorable response than his other tweets.

President Trump has tweeted multiple time each day during his presidency—13,331 tweets during his first three years in office. During this period, the Fed occupied his attention on 42 days, during which he primarily targeted criticism at the Fed's open-market operations on Twitter.

To determine how public reactions to President Trump's Fed-related tweets differ from reaction to his other tweets, Figure 19 reports mean replies, retweets, likes, and the replies-to-likes ratio tweets concerning both the Fed and other subjects.[21]

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21.   The narrow bars report the 95% confidence intervals obtained via Welch's two-sample t-tests; where the 95% confidence intervals for Fed-related and other subjects do not intersection, the difference in between these two categories is statistically significant at the $p=0.05$ level.

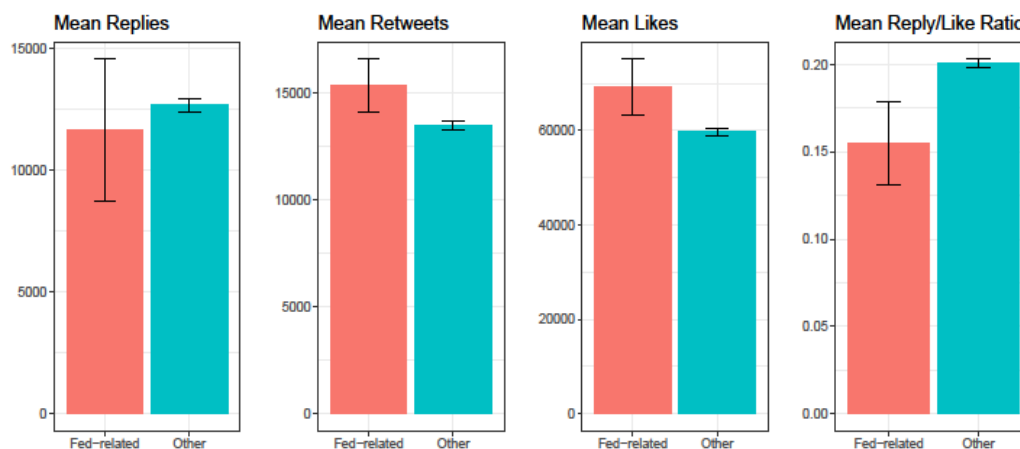## Figure 19: Reactions to Trump tweets on the Fed vs. other subjects

Figure 19 shows that President Trump's critiques of the Fed generate a more positive reaction on average than do his tweets on other subjects. His Fed-related tweets are retweeted more often, garner more likes, and have a lower replies-to-likes ratios than his other tweets. (Concerning the difference-in-mean replies, however, one cannot reject the null hypothesis that the two categories' means are identical.)

Policy implications

The key conclusions from this analysis are that (1) Twitter users are less favorable toward the Fed than they are toward other regulatory agencies and (2) President Trump's critical tweets to a significant extent drive the conversation around the Fed on Twitter. What the Fed should do with this information depends on how it evaluates the risks of genuinely public engagement in ways that the public is engaged.

Perhaps the most interesting question for any central bank or central banker is how to engage in public discourse on Twitter—particularly when faced with public officials' critiques of the institution on that medium. There are at least two ways that organizations can do so. First, they can use the platform as a kind of automated release of information. Second, they can adopt unique voices to provide original content and interact in conversation with Twitter users directly.

Central banks and central bankers have largely adopted the first strategy. Reading through the Fed's official Twitter feed is an exercise in the consumption of news alerts and public relations. But there are counterexamples. To take one extreme, the Central Bank of Jamaica tweeted a professionally produced dubstep song and music video "featuring [reggae star] Denyque and the low, stable and predictable inflation dancers" to explain inflation-

targeting.[22] Closer to home, two Federal Reserve Bank presidents, Neel Kashkari (Minneapolis) and Mary Daly (San Francisco) have adopted voices on the platform that are much more engaged.[23]

The Fed's approach to Twitter so far has been primarily to disseminate research and, to a much lesser extent, make press-release style announcements. Our research does not provide a basis to push the Fed in the opposite direction, toward the Central Bank of Jamaica or even Neel Kashkari. The risk-reward tradeoff on Twitter for adopting a more active, personalized Twitter persona is up to each public official and institutional account to navigate. For the Fed, the risk of a highly personalized approach to Twitter are even higher. The central bank's greatest advantage in public disagreements with other government institutions is its deep expertise concerning monetary policy and the supervision and regulation of financial institution. Conveying in 280 characters nuanced, complex policy decisions grounded in expert judgment is incredibly challenging. Further, the Fed's engagement on Twitter may strip away some of the central bank's mystique—a potential source of its perceived legitimacy—and place it on equal terms on users' feeds with every other Twitter handle.[24]

That said, it is possible that there is a third way that could permit the Fed to engage in more effective communication, whether via dialogue or dissemination. For example, two of the Fed's most important mechanisms for communication are its congressional communications (annual reports and congressional testimony) and the speeches of Fed officials. These have been central to the Fed's communication strategies since the System opened its doors in 1914. But the dissemination of those documents depends on a 20th century communication infrastructure: speeches are made, published, and disseminated through the news. Given the changing circumstances, it seems appropriate for the Fed to make adjustments there, too. Having the Fed tweet threads about the speeches, testimony, and reports would permit it to shape the content of those communications on Twitter more effectively.

Conclusion

President Trump's use of Twitter helped catapult him into the Oval Office. Throughout his presidency, he has turned to the platform to broadcast his views directly to the American people. His critiques of the Fed are a key component of this strategy, among his best received statements on the platform. We expect that public officials' use of social media to bypass traditional media gatekeepers will continue.

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22.   https://twitter.com/CentralBankJA/status/1299127633364557826

23.   https://twitter.com/neelkashkari; https://twitter.com/marydalyecon

24.   *Cf.* Tyler Cowen, *The Nobel Prize Isn't What It Used to Be*, Bloomberg Opinion, Oct. 11, 2020, https://www.bloomberg.com/opinion/articles/2020-10-11/nobel-prizes-2020-awards-not-as-prestigious-as-they-used-to-be; Martin Gurri, *Glamour and the Vision of Legitimate Power*, Cato Unbound, July 14, 2014, https://www.cato-unbound.org/2014/07/14/martin-gurri/glamour-vision-legitimate-power.

Given the generally negative reception that the Fed experiences on Twitter—as well as our view that this dynamic is here to stay—the Fed's practice of using Twitter essentially merely as a form of press release is worth revisiting. Over the past several decades, the Fed underwent a "quiet revolution," transitioning from an opaque, oracle-like posture to provide greater access to journalists. Today, the Fed must once again change with the times and embrace social media platforms alongside traditional media outlets.

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The Brookings Economic Studies program analyzes current and emerging economic issues facing the United States and the world, focusing on ideas to achieve broad-based economic growth, a strong labor market, sound fiscal and monetary policy, and economic opportunity and social mobility. The research aims to increase understanding of how the economy works and what can be done to make it work better.