Do the Voting Rights of Federal Reserve Bank Presidents Matter?

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Abstract

Voting seats at FOMC meetings rotate between Reserve Bank presidents on a yearly basis. Using detailed data on 488 FOMC meetings that took place between 1969 and 2021 and predetermined rotations of voting rights, we show that economic conditions in Reserve Bank presidents' districts affect Federal funds target rates only when those presidents hold voting seats at FOMC meetings. Federal funds futures reflect this effect of local economic conditions on FOMC decisions. Supporting the voting mechanism, we show that voting presidents dissent based on economic conditions in their districts. Reserve Bank presidents' districts are more likely to be mentioned in FOMC transcripts than are the districts of non-voting presidents. Finally, we show that the path of the target rate would have been different if economic conditions in all districts affected FOMC decisions.

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1. Introduction

The Federal Reserve System (the Fed) is responsible for setting monetary policy in the United States. The Federal Open Market Committee (FOMC) is the monetary policymaker body of the Fed. One of the key decisions made at FOMC meetings is whether to alter the Federal funds target rate (FFR), the interest rate at which depository institutions lend balances at the Federal Reserve to other depository institutions overnight. Because FFR decisions impact tens of trillions of dollars, the importance of the FOMC to the U.S. and world economies cannot be overstated.

How are FOMC decisions made? Janet Yellen, Chair of the Federal Reserve during 2014-2018, once described the FOMC decision-making process: "*The Federal Open Market Committee is a group that has been charged with making decisions about the stance of policy, and it consists of the governors who serve on the Board of Governors and the twelve presidents of the Federal Reserve Banks, and of those twelve all attend but five vote at any particular time...My job is to try to find a consensus in the committee for what is an appropriate stance of policy for the day.*"[1] Put differently, the goal is to find a common ground among all meeting participants—governors and the twelve presidents—and identify a policy response that is in the best interests of the nation. Such policy would take into account the interests of all Reserve Bank districts and be consistent with the Fed's stated mandate. An alternative hypothesis is that the committee prioritizes finding a common ground between *voting* members of the FOMC—governors and presidents with voting rights. That is, the FOMC adopts the policy that receives the broadest support of the voting members. In such a case, the adopted policy is likely to under-weight interests of non-voting districts.

In this paper, using detailed data on 488 FOMC meetings that took place between 1969 and 2021 and predetermined rotations of Reserve Bank presidents' voting rights since 1942, we show that district-level (local) economic conditions in Reserve Bank presidents' districts affect the FFR only when those presidents hold voting seats at FOMC meetings. In particular, a one standard deviation (SD) increase in voting districts' inflation predicts a 0.18 SD or 11.5 basis point increase in the next FFR. Using Federal funds futures data, we show that market participants understand and price the effect of local economic conditions on FOMC decisions. Further supporting the voting mechanism, we use a hand-collected dataset that tracks the voting decisions of each voting participant in a meeting and show that voting presidents dissent based on local economic conditions in their districts. Reserve Bank presidents' districts are also 22% more likely to be mentioned by governors and Reserve Bank presidents during

[1]See https://www.youtube.com/watch?v=SJ-AX6PSPXw&t=176s.

FOMC meetings than are non-voting presidents' districts, according to the transcripts.

The voting rights of FOMC members are the center of this paper. Since 1942, the FOMC has consisted of twelve voting members—the seven members of the Board of Governors of the Federal Reserve System, the president of the Federal Reserve Bank of New York, and four of the remaining eleven Reserve Bank presidents, who serve one-year voting terms on a rotating basis. Non-voting presidents participate in FOMC meetings but do not vote. Members of the Board of Governors are nominated by the President of the United States and confirmed by the Senate. Subject to the approval of the Federal Reserve Board of Governors, the presidents of the twelve Reserve Banks are appointed by the Reserve Banks' Class B and C directors (those directors who are not affiliated with a supervised entity). The district presidents are elected to represent the interests of the public in their districts. The President of the United States and the Senate are not involved in the process of selecting the presidents of the twelve Reserve Banks.

It is noteworthy that the rotating nature of Reserve Bank presidents' voting rights was determined in 1942, implying that the allocation of voting rights is exogenous to macroeconomic conditions in our sample.[2] This exogenous allocation of voting rights is at the core of our empirical strategy. We present two pieces of evidence in support of this. First, we show that pre-specified voting rights determine which Reserve Bank presidents can vote at an FOMC meeting. That is, the voting scheme in FOMC meetings as outlined in federal law almost perfectly tracks the actual voting scheme. Second, we show that whether or not a district's president can vote during next year's FOMC meetings is uncorrelated with the district's recent economic conditions.

The empirical analysis is based on several data sources. We begin sample construction by considering all FOMC meetings and conference calls from January 1958 to December 2021 during which the committee discussed and made decisions about target rates, and we record the voting decisions of each participant. As a result, there are 677 events between 1958 and 2021 where target rates decisions were made (661 meetings and 16 conference calls). We then collect and construct a wide range of data sources about these FOMC meetings. We next describe each data source and present key empirical findings established using that data.

First, we establish the key result of this paper: the voting rights of FOMC members have a profound effect on how economic conditions in members' districts affect one of the FOMC's most important decisions, the FFR. One challenge we face is that there

[2] "An Act to Amend Sections 12A and 19 of the Federal Reserve Act, as Amended" July 7, 1942, 56 stat 648. https://fraser.stlouisfed.org/title/act-amend-sections-12a-19-federal-reserve-act-amended-6342

are no readily-available economic variables at the district level, and our identification strategy requires local economic variables at a preferably high frequency (monthly or quarterly), given the frequency of FOMC meetings. Moreover, our identification strategy can be used only if a district-level measure of economic activity exhibits a sufficient degree of heterogeneity across voting and non-voting districts.

We consider three district-level measures of economic activity. District-level inflation is constructed using CPI data at the Metropolitan Statistical Area (MSA) level (source: Bureau of Labor Statistics, "BLS"). We construct our first real growth proxy using personal income (PI) data at the state-quarterly level (source: Bureau of Economic Analysis, "BEA"). Our second real growth proxy is constructed using the unemployment rates (UR) obtained from BLS, which are available at the state-monthly level in a fully balanced way since 1976. Unfortunately, we find that the correlation rate between UR for voting and non-voting districts is close to 95% during most of the sample period. Given that our empirical strategy requires dispersion in a measure of economic activity between voting and non-voting districts, we do not incorporate the UR variable in the empirical analysis and focus on PI as our main measure of economic growth. We construct the monthly inflation rate and quarterly PI growth rate for voting districts and for non-voting districts. Due to data availability for inflation and personal income growth, we consider the sample period from 1969 to 2021, consisting of 488 FOMC meetings.

We find that a one SD increase in voting districts' inflation in the last month predicts a 0.18 SD or 11.5 basis point increase in the next FFR, significant at the 1% level. In contrast, there is no such relationship for non-voting districts. The two coefficients are statistically different. In the same estimation, we find that the coefficient of voting districts' real growth is larger than that of non-voting districts' real growth, with the non-voting effect being essentially zero, but both coefficients are indistinguishable from zero. Importantly, this result is robust to controlling for variables used in state-of-the-art Taylor rule specifications (as in Coibion and Gorodnichenko (2012) and Cieslak and Vissing-Jorgensen (2021)) and U.S. aggregate macro variables.

We perform several robustness tests. First, we show that the results are not driven by any particular district, including the New York District; that district's president's voting right is not rotating. Second, we show that our main results hold in the 1994-2021 period, suggesting that the underlying mechanism is less likely to be driven by changing U.S. economic or monetary policy regimes. Third, we show that the results are robust to using MSA population-weighted inflation rates for districts with multiple MSA-level CPI data series. Finally, we show that results hold and even become stronger when we replace the main outcome with a categorical variable that captures the direction of the change in the FFR. Importantly, this test shows that whereas the role of inflation rates in voting districts is stronger when we consider the extensive margin, inflation rates in non-voting districts remain irrelevant for FFR decisions.

Our second result shows that market participants understand and price the effect of economic conditions in represented districts on the FFR. To establish this result, we examine the changes in the Federal funds (FF) futures rate between two consecutive FOMC meetings. The sample period for this analysis is from 1994 to 2021, given that the FOMC did not release statements about monetary policy decisions to the public until 1994 (see discussions in Rudebusch (1995), Bernanke and Kuttner (2005), and others). We find that a one SD increase in voting-district inflation in the prior month predicts a 0.26 SD or 7.8 basis point increase in the FF futures rate, significant at the 1% level, while the coefficient of a non-voting district's inflation rate is indistinguishable from zero; both coefficients are statistically different from each other. We find weak evidence using real growth counterparts in a joint estimation. This is a clear indication that investors understand and price in the importance of disaggregating national inflation rates into inflation rates in voting and non-voting districts.

Our results thus far indicate that not only do voting districts' inflation rates affect FFR decisions, but also investors understand and price in these effects. We next provide two sets of evidence that support the role of Reserve Bank presidents' voting rights in shaping the FOMC's decisions. First, we use a novel hand-collected dataset on FOMC members' voting decisions and examine whether economic conditions in Reserve Bank presidents' districts predict their voting decisions. Each voting participant at an FOMC meeting needs to announce her voting decision during a roll call towards the end of the meeting. We construct and examine three dependent variables at the meeting-voting participant level: whether a voter dissented from the majority opinion, whether she dissented in favor of a tighter policy, and whether she dissented in favor of an easier policy.

We find that, after controlling for the national inflation rate and real growth, Reserve Bank presidents in districts with inflation rates that are higher than the aggregate inflation rate are more likely to dissent and vote for a tighter policy. A one SD increase in voting district inflation in the last month predicts a 1.6% increase in the likelihood of a tighter dissent decision. Given that a tighter dissent decision from a Reserve Bank president is an event with a 6% likelihood in the long history of the FOMC, the economic magnitude of this effect is sizable.

Second, under our hypothesis that the voting rights of Reserve Bank presidents contribute to the effect that local economic conditions in those presidents' districts have on the aggregate U.S. monetary policy, one would expect that establishments and organizations in voting districts would be mentioned and discussed more often than those in non-voting districts. To test this prediction, we examine transcripts of FOMC meetings. FOMC meeting transcripts are detailed word-by-word meeting proceedings, which become available at the Federal Reserve website after a 5-year delay. Using the 357 meeting transcripts from 1976 to 2016 (the maximum sample), we measure whether a district is mentioned in a transcript by counting keywords that can be linked to the district. A district's keywords include geographical features, federal agencies, universities, (well-known) businesses, and newspapers in that district. We focus on words spoken by governors and Reserve Bank presidents (with and without voting rights).

We find that a district is 22% more likely to be mentioned if its president is a voting member in the meeting. The effect remains significant and even stronger (50% more likely) if we focus on words spoken by governors, which is an important finding given that governors' terms are relatively long (up to 14 years). That is, governors actively change the content of their speech or comments during an FOMC meeting when a district's status changes from voting to non-voting. Taken together, the evidence obtained from textual analysis of FOMC transcripts supports the idea that voting Reserve Bank presidents talk about their districts and then governors respond to their arguments; this offers more direct and micro evidence on the role of Reserve Bank presidents' voting rights in shaping the FOMC's decisions.

We conclude the analysis by quantifying potential distortions in FFRs that are induced by the allocation of voting rights to five out of twelve Reserve Banks. We find that the existing voting scheme can lead to potentially meaningful distortions in FFRs. The main reason is that economic conditions in most districts do not affect FFR decisions. Indeed, we show that if voting rights had been allocated to all twelve districts, the path of the target rate would have been different. Importantly, we show that distortions to FOMC decisions do not cancel out when aggregated across time periods.

Related Literature

Our paper contributes to several strands of the economics and finance literature. First, this paper contributes to the macroeconomics literature that studies the determinants of monetary policy decisions. The significant effects of U.S. monetary policy on the real economy are widely accepted and shown in macroeconomics literature. Under the standard Keynesian framework, prices are rigid and any changes in the aggregate demand cause output to change, implying that monetary policy could be used to directly affect aggregate consumption and investment (e.g., Woodford (2003), Galí (2008)). As the nation's monetary policy authority, the Fed has aimed for price stability and sustainable economic growth since its formation under the Federal Reserve Act of 1913, and there is a voluminous empirical literature trying to test and identify the determinants of changes in monetary policy decisions – mostly, the target rate – in reality, using country-level variables such as actual lagged or forecasting economic data. In his seminal work, Taylor (1993) demonstrates that past monetary policy rules can indeed be closely tracked by changes in the price level or real income.[3]

To date, to the best of our knowledge, there is no study that exploits the effects of differences in economic conditions across districts on FOMC decisions. We therefore contribute to this literature by showing that economic conditions in voting and non-voting districts have profoundly different effects on FOMC decisions. This finding points out that future studies need to consider the heterogeneity in economic conditions across voting and non-voting districts. Moreover, our findings call for future research on the implications of the existing voting scheme for the efficiency of FOMC decisions.

Whereas this study is focused on the real consequences of the FOMC voting structure, our research also relates to the literature that studies the voting behaviors of FOMC members and their background characteristics (e.g., Belden (1989), Havrilesky and Schweitzer (1990), Havrilesky and Gildea (1991), Chappell Jr, Havrilesky, and McGregor (1993), Chappell Jr and McGregor (2000), Crowe and Meade (2008)). The standard empirical framework in this literature has individual-level interest rate preferences (as revealed in meeting transcripts or other documents) as the dependent variable of interest and individual-level characteristics (e.g., career, political party, education, gender, local economy, and so on) as explanatory variables. Existing studies acknowledge the importance of understanding the effect of personal biases on monetary policy decisions, but have not reached a consensus.[4]

[3]Building on that, one strand of work focuses on using advanced econometric frameworks to improve the estimation of the Taylor rule (see e.g. Ang, Boivin, Dong, and Loo-Kung (2011), Bikbov and Chernov (2013)), while another burgeoning strand focuses on identifying other determinants or incorporating more precise empirical proxies to help improve predictability. For instance, Clarida, Gali, and Gertler (2000) (and many papers around the same time, such as Rudebusch (2002)) document that current interest rate decisions can be closely predicted by recent lagged interest rate(s). Romer and Romer (2000) document that Greenbook (now known as the Tealbook) forecasts of changes in price level and real income or productivity at the aggregate level systematically outperform forecasts by professional forecasters. Coibion and Gorodnichenko (2012)'s empirical framework, which incorporates both aforementioned important findings, has been commonly used by researchers as the state-of-the-art empirical framework for testing the monetary policy consequences of new determinants, such as financial instability and stock market behaviors (see e.g. Cieslak and Vissing-Jorgensen (2021)).

[4]Among those of more relevance for our research, Tootell (1991) and Gildea (1992) use a 1965-

Our study differs from this literature in two major ways. First, the literature focuses on examining the voting members' personal biases. On the other hand, our main goal is to compare voting and non-voting Reserve Bank presidents and their relative effects on FOMC decisions. Second, our study improves upon the existing literature in terms of empirical strategy and sample size. Whereas studies mentioned above use unemployment rates as a proxy for local economic conditions, we also use local inflation and real growth variables. Importantly, we show that the statistical properties of changes in unemployment rates invalidate the usage of this variable to study heterogeneity across voting and non-voting districts. We therefore focus on inflation rates and personal income growth variables. Finally, our voting sample extends from 1/7/1958 to 12/15/2021, a much longer sample than, to the best of our knowledge, all existing papers in this personal bias literature, which increases the statistical power of our tests.

Second, our paper contributes to the political economy literature that studies the balance of power between various forms of government, including the federal government, states, and municipalities. The literature has analyzed the provision of a wide range of services, including welfare, legal services, health services, and housing (see, for example, Tiebout (1956), Fiss (1987), Merritt (1988), Boeckelman (1992), Weingast (1995), Inman and Rubinfeld (1997), Oates (1999), Besley and Coate (2003), Volden (2005), and Bulman-Pozen (2012)). For instance, Tiebout (1956) shows that the provision of local public goods can more effectively reflect the preferences of the population than the provision of the same goods at the national level. Our paper contributes to this literature by providing the first evidence on the effects of decision rights allocated to Federal Reserve Banks on macroeconomic policy. Specifically, we show how national and local economic conditions are aggregated into FOMC decisions and how the voting rights of FOMC members affect this aggregation process. We find that the existing allocation of decision rights transmits the tension between the nation's and districts' economic interests into macroeconomic policy decisions.

Third, our paper contributes to the asset pricing literature by identifying a novel source of variation in interest rates that is rooted in the FOMC voting scheme. In a standard affine-class asset pricing model with no arbitrage assumptions, asset prices are determined by risk premiums, expected cash flows, and interest rates. While the risk premium channel has been given major focus and is believed to be the main

1985 sample and a 1960-1987 sample, respectively, and find little evidence that regional economic conditions explain Reserve Bank presidents' votes. On the other hand, Meade and Sheets (2005) use a 1978-2000 sample and arrive at the opposite conclusion, supporting the role of regional developments in explaining presidents' interest rate preferences. Jung and Latsos (2014) represent a more recent update in this debate using a 1990-2008 sample but find mixed results.

driver of stock return fluctuations, the recent empirical literature has called for a reexamination. For instance, Binsbergen (2020) shows that the stock market has not been outperforming these fixed income counterfactuals over the past 20 years, implying that the equity risk premium puzzle has diminished and investors have not received the right amount of compensation for taking long-duration cash flow risk. Therefore, the continuously heightening market volatility has to come from either the cash flow or the interest rate channel. Consistently with Binsbergen (2020), Bekaert, Hoerova, and Xu (2021) show that monetary policy effects on stock prices may reflect a persistent pure interest rate effect. Given the renewed interest in the interest rate channel, our paper indicates that the asset pricing literature needs to consider district-level economic conditions and the voting scheme of the FOMC to better understand the determinants of interest rates.

Finally, this study contributes to the literature that studies voting. The literature covers the role of voting in various settings, including political elections (e.g., Lee, Moretti, and Butler (2004), Lee (2008)) and corporate governance (e.g., Manne (1962), Grossman and Hart (1988), Harris and Raviv (1988), Zingales (1995), Yermack (2010), Fos and Tsoutsoura (2014)). In the context of political elections, Lee, Moretti, and Butler (2004) show that the degree of electoral strength does not affect a legislator's voting decisions. In the corporate governance setting, Manne (1962) was one of the first to propose that shareholder voting matters. Our paper contributes to this literature by showing that the way voting rights are allocated to Reserve Bank presidents has an important role in shaping FOMC decisions.

2. Institutional Background

The Federal Reserve Act of 1913 created and gave the Federal Reserve System (the Fed) responsibility for setting monetary policy to provide the nation with a safer, more flexible, and more stable monetary and financial system.[5] The Federal Open Market Committee (FOMC) is the monetary policymaking body of the Federal Reserve System, and was created by the Banking Act of 1933. Voting rights in the 1933 FOMC were exclusive to the twelve Reserve Bank presidents; this was amended in 1935 and 1942 to extend voting rights to the Federal Reserve Board of Governors. This is the modern FOMC, which consists of twelve voting members—the seven members of the Board of Governors of the Federal Reserve System, the president of the Federal Reserve Bank of New York, and four of the remaining eleven Reserve Bank presidents, who

[5]Source: `https://www.federalreserve.gov/aboutthefed/the-fed-explained.htm`.

serve one-year terms on a rotating basis.

Members of the Board of Governors are nominated by the President of the United States and confirmed by the Senate. Each governor can serve up to 14 years, and the terms are staggered such that one term expires every two years. If a governor leaves before her term is up, the successor completes this term. The Board's objective is to provide general guidance for the Federal Reserve System and to oversee the 12 Reserve Banks.

Subject to the approval of the Federal Reserve Board of Governors, the presidents of the twelve Reserve Banks are nominated by the Reserve Banks' Class B and C directors (those directors who are not affiliated with a supervised entity). The district presidents are elected to represent the interests of the public in their districts. The President of the United States and the Senate are not involved in the process of selecting the presidents of the twelve Reserve Banks.

The voting seats given to district presidents rotate on a yearly basis; this mechanical rotation scheme was put in place in the 1942 amendment.[6] The rotating seats are filled from the following four groups of Banks, one Bank president from each group: (1) Boston, Philadelphia, and Richmond; (2) Cleveland and Chicago; (3) Atlanta, St. Louis, and Dallas; (4) Minneapolis, Kansas City, and San Francisco. Nonvoting Reserve Bank presidents attend the meetings of the Committee, participate in the discussions, and contribute to the Committee's assessment of the economy and policy options. Figure 1 shows the maps of the twelve districts. Importantly, since the assignment of voting rights to presidents of Reserve Banks is specified in Section 12A of the Federal Reserve Act,[7] the public can be, and should be, fully informed about the allocation of voting rights amongst presidents of Reserve Banks.

[Insert Figure 1 here]

The FOMC holds eight regularly scheduled meetings per year.[8] At these meetings, the Committee reviews economic and financial conditions, determines the appropriate stance on monetary policy, and assesses risks to its long-term goals of price

[6] To be specific, prior to 1990, the FOMC's Rules of Organization stated that the Reserve Bank representatives on the FOMC are elected by the boards of directors of the Reserve Banks in accordance with section 12A of the Federal Reserve Act for terms of one year commencing on March 1 of each year. At the November 1, 1988 FOMC meeting (meeting minutes linked below), the FOMC voted to amend the Rules of Organization to advance the start of the annual terms of newly elected members and alternate members of Federal Reserve Banks from March 1 to January 1 of each year, effective January 1, 1990. The Federal Reserve Act also specifies the Alternate Member schedule, i.e., determines which Reserve Bank president can vote in the place of a Reserve Bank president who is supposed to vote but cannot vote. We show in Table 5 that deviations from the assigned voting scheme are very rare.

[7] https://www.federalreserve.gov/aboutthefed/section12a.htm.

[8] https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm.

stability and sustainable economic growth. Using various tools of monetary policy, the Fed alters the Federal funds rate (FFR), the interest rate at which depository institutions lend balances at the Federal Reserve to other depository institutions overnight.

3. Data

In this section, we describe several data sources, some of which have never been used in academic research prior to this paper, and then present descriptive statistics.

3.1. Data Sources

We begin by describing how we collect data on FOMC meetings and how we construct independent and outcome variables.

3.1.1. FOMC meetings

We focus on all FOMC events (meetings and conference calls) from January 1958 to December 2021 that satisfy the following three criteria: The committee has (1) discussed and made decisions about target rates, with voting decisions from each voting participant; (2) released policy statements (for events after February 1994);[9] and (3) generated transcripts or minutes of the meeting for the public.

These criteria are motivated by our research objective. The first criterion informs our main outcome variable, the Federal funds rate ("FFR"). This is the FOMC's decision and is viewed as a standard measure of monetary policy. The FFR also has a corresponding futures market variable, which allows us to examine whether investors anticipate changes in FFRs. The second criterion is statement releases, which occur on the day of the meeting or the following day. Statements are an important communication tool used by central banks; often when there is no decision being made or votes being cast, no statement is released. These released statements also drive large responses in the asset prices (e.g., see Gürkaynak, Sack, and Swanson (2005), Cieslak and Schrimpf (2019), Jarociński and Karadi (2020), among many others). The third criterion is an available meeting proceedings document, such as a transcript or minutes. In particular, the transcript is the most detailed record of FOMC meeting proceedings with precise dialogues between participants. Later in the paper, we will focus on transcripts to shed light on how the voting rights of district presidents affect their voting and communication decisions. Transcripts are made available to the public

[9]Post-meeting statements first started in February 1994. We run robustness tests using post-1994 data as well.

with a five-year delay and the first transcript record from the Federal Reserve archive is the 4/20/1976 meeting.

The first criterion turns out to be the most restrictive. Among the 786 FOMC events between 1/7/1958 and 12/15/2021 that we hand-collected from the Federal Reserve website, 677 of them voted on target rates decisions, and all of these released policy statements and meeting proceedings (transcripts or minutes) for the public.[10] 661 are FOMC meetings and 16 are conference calls. For simplicity, we refer to all of them as "FOMC meetings" in the remainder of the paper. The black line in Figure 2 displays the time series of the number of actual votes in meetings from 1958 to 2021. While the total number of votes has been mostly maintained at 12, we observe time-series variation and several major drops in recent history.[11] The blue solid line and the dashed orange line decompose the total number of actual votes into the number of voting presidents and governors, respectively, and show that the variation in the number of votes is primarily due to the variation in the number of governors, which is often below 7 due to vacancies.

[Insert Figure 2 here]

3.1.2. Local macro variables

Local macro variables refer to the economic conditions of the 12 Reserve Bank districts.[12] Given our research objective and data availability, we obtain and consider three district-level measures of economic activity: inflation rates, real growth rates, and unemployment rates. These variables are important determinants of monetary policy decisions (or in standard terms the Taylor Rule).

Local inflation. Monthly aggregate U.S. CPI data are available from January 1947 (source: FRED). Because there are no readily available inflation or CPI data reported at the Reserve Bank District level or state level, we rely on data reported by the Bureau of Labor Statistics (BLS). Specifically, BLS reports the "Metropolitan Statistical Area" (MSA) CPI for all urban consumers. Table A1 in Appendix A summarizes all data options downloadable from the BLS website at the metropolitan area level and evaluates how suitable they may be to proxy for district-level CPI data based on their

[10] There are 109 FOMC events that we do not study in this paper; they are all conference calls with relatively short meeting times, and 27 of them (post 1994) did not release policy statements, but they all posted transcripts or minutes. The topics discussed in these 109 events typically involved decisions on money supply and exchange rates.

[11] The lowest point in Figure 2 corresponds to the 8/1/2018 meeting, https://www.federalreserve.gov/monetarypolicy/fomcminutes20180801.htm, in which only 8 members voted.

[12] Throughout the paper, we use "local" and "district" interchangeably.

time series properties (year coverage and frequency). Given that FOMC meetings happen every month or every other month, CPI data at the monthly frequency is preferred for our research objective. For those districts with multiple CPI data choices, we consider the MSA with the largest population according to the United States Census Bureau.

Most districts have consecutive CPI data at monthly, bi-monthly, or quarterly frequency, and the sample frequency can vary over time within the same district. To impose consistency across districts, we construct monthly inflation rates. For monthly CPI series, monthly inflation is the percentage change in CPI. For other frequencies (bi-monthly or quarterly), we compute the percentage changes between the two consecutive CPI numbers, divide this by the number of months between two the CPI numbers, and then fill the months in between. For instance, for data at bi-monthly frequency, if the percentage change between the available March and May CPI values is 0.4%, we assign the April and May inflation rates a value of 0.2%.[13] In the empirical analysis, we aggregate districts into two groups: districts with voting rights and districts without voting rights. Specifically, $Infl^{Vote}_{m,t-1}$ ($Infl^{NoVote}_{m,t-1}$) denotes the average monthly inflation rate among districts with (without) voting rights during the month prior to meeting m. The monthly or quarterly macro variable is time stamped with "t." Given our research objective, we are interested in tracking the average recent past macro conditions of districts with and without voting rights in meeting m, which we denote as $\{m, t-1\}$. The previous month's U.S. inflation rate is denoted as $Infl^{US}_{m,t-1}$. Inflation variables are in units of percent.

Local real growth. We use Personal Income (PI) growth as our main *economic growth* proxy. This variable is constructed by the BEA and is available at the state-quarterly level in a fully balanced way from as early as 1948 in some states.[14] The United States Regional Economic Analysis Project (US-REAP), https://united-states.reaproject.org/data-tables/quarterly-earnings-sq5/, also uses this personal income data to conduct economic growth analysis.

To construct *district-level* personal income growth, we obtain state-level quarterly personal income growth rates and create a district average among the covered

[13] There are four districts with a long series of annual or (smoothed) semi-annual data only: Atlanta (1987-1997), St Louis (1998-2017), Minneapolis (1987-2017), and Kansas City (1987-2017). In these cases, we do not construct or "invent" monthly inflation rates, and consider these local inflation rates missing in our analysis. We are able to obtain monthly inflation rates for most districts starting from the 1940s, with the exceptions of Cleveland (1966) and Kansas (1964).

[14] State-level GDP data is available and downloadable starting in 2005 at the US Bureau of Economic Analysis (BEA) website. However, we aim to use the longest possible sample for our variables and prefer data available at a frequency higher than annual.

states. The real district PI growth rates are constructed by deducting the corresponding district inflation at the quarterly frequency. $rgPI$ denotes real PI growth, which is available at the quarterly frequency, and $rgPI^{Vote}_{m,t-1}$, $rgPI^{NoVote}_{m,t-1}$, and $rgPI^{US}_{m,t-1}$ are defined analogously to inflation rates. Real growth variables are in units of percent.

Local changes in unemployment rates. We construct changes in the Unemployment Rates (UR) as an alternative proxy for economic growth. This UR variable is constructed by the BLS and is available at the state-monthly level in a fully balanced way since 1976. To construct *district-level* changes in UR, we first create a district average of UR among the covered states, and then take the first differences. $chgUR$ denotes changes in UR, which is available at the monthly frequency, and $chgUR^{Vote}_{m,t-1}$, $chgUR^{NoVote}_{m,t-1}$, and $chgUR^{US}_{m,t-1}$ are defined analogously to inflation rates. Changes in UR variables are in units of percent rates (i.e., first differences in unemployment rates expressed in %).

3.1.3. Outcome variables

Target Federal funds rate data. We use standard data sources to obtain information on FFRs. Romer and Romer (2004) provide data that cover FOMC meetings from the January 14, 1969 meeting through the December 17, 1996 meeting. Kenneth N. Kuttner's dataset covers FOMC meetings from the February 5, 1997 meeting to the June 19, 2019 meeting. Starting in 2008, the target rate becomes a range. Given that most studies are interested in changes in the target FFR, we follow Kuttner's choice of using the change in the lower range value to obtain the changes in FFR for meetings after June 19, 2019.[15] This allows us to extend our sample through the end of 2021.

Federal funds futures. To capture investors' expectations about policy actions (the Federal funds rate), we follow Kuttner (2001) and Bernanke and Kuttner (2005) and use the price of Federal funds futures contracts to infer market expectations about the effective Federal funds rate, averaged over the settlement month.[16] As precautionarily mentioned in existing monetary economics literature (e.g., Rudebusch (1995), Bernanke and Kuttner (2005), and recently Cieslak and Vissing-Jorgensen (2021)), before 1994, market participants generally became aware of policy actions one to two days after the FOMC's decision, when it was implemented by the Open Market Operations Desk. As a result, while Federal funds futures contracts started trading in

[15] We thank Kenneth Kuttner for offering this suggestion.

[16] The contracts are officially referred to as "30 Day Federal Funds Futures," and are traded on the Chicago Board of Trade (CBOT), a part of the Chicago Mercantile Exchange (CME) Group. By design, the implied rate is 100 - settlement price.

1989, we focus on the period after 1994 in the part of the analysis that uses futures data.

We are particularly interested in longer term futures. Investors understand that, according to the law, the FOMC district participant list rotates at a low frequency (yearly); under our hypothesis that the macro conditions of districts with voting rights in an FOMC meeting might be over-weighted, investors could also believe that the voting district presidents hold persistent views while in the voting chair. Moreover, we have no strong reasons to focus on one particular term. As a result, we use the average implied rate of Federal funds contracts across 1- through 24-month terms as an outcome variable of interest, denoted by Δf_m. Appendix A.4 also offers more data details.

FOMC voting. We collect voting results for each participant in an FOMC meeting – Agree, Dissent for a tighter monetary policy, Dissent for an easier monetary policy, or Dissent for other reasons – from various public FOMC documents that describe the proceedings of FOMC meetings: Record of Policy Actions (before 1967), Record of Policy Actions and Minutes of Actions (1967-1975), Transcript and Minutes (1976-2016),[17] and Minutes (2017-2021). In this step, we start with the existing effort made by Thornton and Wheelock (2014), whose dataset provides the last names of all dissenters in a meeting (i.e., 09/21/11, Fisher, Kocherlakota, Plosser). We aim to create the most complete FOMC voting database at the meeting-participant level. In this new effort, we expand and include first, last, and full names, district/board affiliations, and the voting decisions of all voting participants in a meeting. This dataset can also potentially be used by other researchers in a variety of ways.

FOMC transcripts. We download *all* transcripts available on the Federal Reserve website, with the first available file with an interest rate decision being 4/20/1976 and the last available file being 12/14/2016. There are a total of 357 files (meetings). Transcripts show detailed conversations among all speakers, word by word. Transcripts of FOMC meetings can have 300 or more pages, while transcripts of FOMC conference calls typically have 5 to 30 pages. All transcripts end with a roll call of voting decisions. Transcripts record the entire conversation as it was spoken, including all contributions from governors and district presidents who have votes, district presidents who do not have votes, Fed economists, and other accompanying and meeting staff.

[17] Transcripts are released on a 5-year delay. As of September 2022 (time of our first draft), the last available transcript is the December 13-14, 2016 meeting.

3.2. Descriptive Statistics

Tables 1 and 2 provide the summary statistics for all independent and dependent variables at the time-series and meeting level and at various panel levels, given our empirical designs. In Table 1, we report summary statistics for changes in the FFR as well as inflation and personal income growth variables. Panel A covers the 1969-2021 sample period and panel B covers the 1994-2021 sample period. Consider first the 1969-2021 sample period. The average (median) change in the FFR is -0.013% (0.000%). The average monthly U.S. inflation rate prior to FOMC meetings is 0.36% (or around 4% per annum), and the average voting and non-voting district inflation rates are 0.35% and 0.37%, respectively. The average personal income growth rate is 0.63% per month, with almost no difference between voting and non-voting districts. Panel B also reports summary statistics for the Federal funds futures rate during the 1994-2021 period. The average change in the FF futures rate is -0.008%.

[Insert Table 1 here]

[Insert Table 2 here]

In Table 2, Panel A reports summary statistics for voting decisions at the meeting-voting president level. The average likelihood of dissent is 8% for voting presidents. The likelihood of a dissent with tighter (easier) monetary policy goals is 6% (1%), indicating that presidents of Reserve Banks more often dissent with tighter monetary policy goals.

Summary statistics for the textual analysis sample are reported in panel B of Table 2. The unit of observation is meeting-district; that is, for each meeting, there are 12 data points. The average (median) number of times a keyword that can be linked to a district is mentioned by either governors or Reserve Bank presidents is 3.66 (median of 2.00). Governors are less likely to refer to a specific district than presidents of Reserve Banks: the average number of times a keyword that can be linked to a district is mentioned by a governor (a Reserve Bank president) is 0.74 (2.92). This evidence indicates that presidents of Reserve Banks are more likely than governors to speak about local economic activity.

Next, we turn to the time-series properties of three district-level measures of inflation, personal income growth, and unemployment. Panel A in Table 3 reports the average correlation rate between inflation rates and personal income growth rates for voting and non-voting districts for the 1969-2021 sample. Panel B reports the average correlation rate between inflation rates, personal income growth rates, and unemployment rates for voting and non-voting districts for the 1976-2021 sample, as this is the sample for which unemployment rate data are available.

[Insert Table 3 here]

The correlation between inflation rates for voting and non-voting districts is about 60% in both samples. In contrast, the correlation between real personal income growth rates for voting and non-voting districts is much higher, about 88%. We also document that the correlation between unemployment rates for voting and non-voting districts exceeds 95%. Figure 3 shows that the correlation between inflation rates for voting and non-voting districts within a moving rolling window fluctuates substantially during the sample period, taking values between -20% and 60%. The rolling correlation between personal income growth rates for voting and non-voting districts, in the red dashed line, is always higher than that for inflation rates, in the black solid line, and mostly stays between 40% and 80%. The most extreme evidence is for unemployment rates: the rolling correlation between unemployment rates for voting and non-voting districts hovers around and above 95% most of the time, which strictly dominates the the other two rolling correlation series.

[Insert Figure 3 here]

The results indicate that the two real economic growth proxies – real personal income growth and unemployment rates – exhibit much higher levels of co-movement across voting and non-voting districts than inflation rates. This finding is important for our empirical strategy. We are interested in testing whether economic conditions in voting and non-voting districts have profoundly different effects on FOMC decisions. Therefore, our measures of economic conditions of voting and non-voting districts should exhibit enough dispersion between voting and non-voting districts in order to test our hypothesis. Given that the rolling correlation between voting and non-voting unemployment rates is close to 95% most of the time, we do not choose to incorporate the unemployment rate variable as our main real economic growth proxy in the empirical analysis. Instead, we rely on real personal income growth.

4. Main Results

In this paper, we provide the first evidence on the real consequences of the heterogeneous set of incentives faced by FOMC members. The mandate given to the Fed requires that the FOMC should act in the best of interests of the nation, i.e., the general, representative U.S. public. The Board reports and is directly accountable to Congress but, unlike many other public agencies, the Board is not funded by congressional appropriations. In addition, though Congress sets the goals for monetary policy, the decisions of the Board and the Fed's monetary policy-setting body, the Federal Open Market Committee, about how to reach those goals do not require approval by the President or anyone else in the executive or legislative branches of the government.

Presidents of Reserve Banks, however, are elected to represent the interests of the public in their districts. Therefore, if economic conditions vary across districts, the presidents of Reserve Banks can assign a higher weight to the interests of the public in their districts than to the interests of the overall U.S. public. Our goal is to test whether economic conditions in represented districts (i.e., districts with votes at the FOMC meeting) and non-represented districts have differential effects on Federal funds rates.

4.1. The Determinants of District Presidents' Voting Rights

The predetermined, rather mechanical rotating structure of FOMC membership is a key factor in our empirical analysis. We begin by presenting two pieces of evidence in support of our empirical strategy. First, we show that pre-specified voting rights determine which Reserve Bank presidents can vote at an FOMC meeting. That is, the intended voting scheme in FOMC meetings indeed closely tracks with the actual voting scheme.

Table 4 reports the results for the two sample periods, 1969-2021 and 1994-2021, that are considered in different parts of our paper. The bottom two rows report the likelihood of a mismatch between the actual voting status and the pre-specified voting status of a district. The likelihood of a mismatch ranges from 0.1% to 1.1%, indicating that the predetermined voting scheme is closely followed.[18] When we regress an indicator of a district's president voting during a meeting on her pre-specified voting status during that meeting, we find that the coefficients are between 0.92 and 0.99, highly statistically significant with large F-statistics.[19]

[18]In the sample period, 1969-2021, there are 58 instances in which district presidents voted when they should not have according to the 1942 law and the Alternate Member schedule (58/5,856=1.0%, as displayed in the table). In the 1994-2021 sample, there are 3 instances in which district presidents voted when they should not have according to the 1942 law and the Alternate Member schedule (3/2,760=0.1%, as displayed in the table). The three anomalous votes in the smaller sample all occurred at the January 21, 2008 meeting, where the FOMC was supposed to start the new 2008 rotation (Cleveland, Philadelphia, Dallas, Minneapolis) but continued using the 2007 rotation (Chicago, Boston, St. Louis, Kansas City); as Chicago was Cleveland's alternate member in 2008, their vote was in accordance with the schedule.

[19]Small deviations are anticipated due to health issues or other reasons, such as a power transition

[Insert Table 4 here]

The above results indicate that district presidents' voting status is exogenously determined by law and not likely to be influenced by omitted variables. To further support this conclusion, we next show that whether or not a district's president can vote during next year's FOMC meetings is uncorrelated with the district's recent economic conditions. Specifically, we estimate the following regression:

$$Vote_{r,t} = \alpha + \beta_1 \text{Inf}_{r,t,q-1} + \beta_2 \text{rgPI}_{r,t,q-1} + \varepsilon_{r,t}, \tag{1}$$

where $Vote_{r,t}$ is an indicator of whether the representative of district r votes during year t, $\text{Inf}_{r,t,q-1}$ is district r's inflation rate during the fourth quarter that precedes year t, and $\text{rgPI}_{r,t,q-1}$ is district r's personal income growth rate during the fourth quarter that precedes year t.

Panel A in Table 5 reports the results. Columns (1) through (3) report results for the full sample and columns (4) through (6) report the results for the 1994-2021 sub-sample, which we use to study some of the outcome variables. The results show no significant relationship between local economic conditions and whether a district's representative can vote in an FOMC meeting, suggesting that we can treat the allocation of voting rights to district representatives as exogenous to local economic conditions. Panel B shows that the results remain consistent when we replace measures of local economic conditions during the previous year's fourth quarter with measures of local economic conditions during the previous year.

[Insert Table 5 here]

Overall, the results indicate that we can treat the variation in district presidents' voting rights as exogenous to local economic conditions and to the outcome variables we consider.

4.2. Federal Funds Rates

In this section we present the main results of our paper, the effect of local economic conditions and the FOMC's voting structure on the FFR. The main outcome

(i.e., by law, district presidents are nominated by their district board, but they need to be confirmed by the Board of Governors, so there can be a transition gap). Depending on the nature of the absence, a vacancy can be declared without replacement, or the FOMC committee can ask other district presidents from the same group to vote (see Footnote 6). Substitution with an alternate member is typically what happens when the absent district has a voting right. In rare cases, the district vice president comes as a replacement (e.g., Sandra Pianalto, President of the Federal Reserve Bank of Cleveland, asked Greg Stefani, First Vice President of the Cleveland Fed, to attend the June 19, 2013 meeting; in this meeting, Cleveland was not a voting member).

variable is the change in the Federal funds target rates between meetings. We estimate the Taylor rule augmented with last average economic variables for districts with voting and non-voting presidents. Specifically, we estimate the following specification for our longest sample period (1969-2021):

$$\Delta FFR_m = \alpha + \beta_1 \text{Inf}^{Vote}_{m,t-1} + \beta_2 \text{Inf}^{NoVote}_{m,t-1} + \gamma_1 \text{rgPI}^{Vote}_{m,t-1} + \gamma_2 \text{rgPI}^{noVote}_{m,t-1} + \sum_{k=1}^{K} \tau_k FFR_{m-k} + \boldsymbol{\delta X_m} + \varepsilon_m, \quad (2)$$

where ΔFFR_m is the change in the Federal funds target rate from meeting $m-1$ to meeting m. As explained in Section 3.1.2, $\text{Inf}^{Vote}_{m,t-1}$ is the last average monthly inflation rate for voting districts prior to meeting m, and $\text{Inf}^{NoVote}_{m,t-1}$ is the last average monthly inflation rate for non-voting districts. Similarly, $\text{rgPI}^{Vote}_{m,t-1}$ is the last average quarterly real personal income growth rate for voting districts, and $\text{rgPI}^{noVote}_{m,t-1}$ is the last average quarterly real personal income growth rate for non-voting districts. We allow for interest rate smoothing (lagged FFR terms) up to the third order. $\boldsymbol{X_m}$ denotes the set of control variables, including the US inflation and real growth variables, the zero-lower-bound indicator and interaction terms and various Greenbook forecasts. The unit of observation is one FOMC meeting.

Our approach builds on but differs from a general specification of the Taylor rule, as we accommodate local variables to reflect our research objective. The Taylor rule is forward looking, and therefore, in its empirical adaptation, the recent literature uses Greenbook (currently known as Tealbook) forecasts for the aggregate economy (see, e.g., Coibion and Gorodnichenko (2012), Cieslak and Vissing-Jorgensen (2021) among many others). Each Greenbook is produced by the Board of Governors and has a five-year delay in its public release, suggesting that only ex post analysis of the Taylor rule is empirically possible. Notably, our paper has a different objective, as we are interested in whether past local economic conditions in voting versus non-voting districts affect FOMC decisions. Moreover, to the best of our knowledge, there is no public projection data at the district level.

The results are reported in Table 6. Column (1) shows that, as expected, higher national inflation and personal income growth rates are positive predictors of an increase in the FFR. Specifically, in terms of economic magnitude, a one standard deviation (SD) increase in national inflation (national real PI growth) in the preceding month, compared to the historical average, predicts a 0.11 (0.08) SD or 6.8 (5.3) basis point increase in the next FFR. We replicate this baseline aggregate framework using Greenbook variables as in Cieslak and Vissing-Jorgensen (2021) and find a similar economic magnitude.[20]

[Insert Table 6 here]

Column (2) shows the main result: there is a significant positive relationship between inflation in voting districts and changes in the FFR. In terms of economic magnitude, a one standard deviation (SD) increase in a voting district's inflation in the last month predicts a 0.18 SD or 11 basis point increase in the next FFR, at the 1% significance level. In contrast, there is no such relationship for non-voting districts: the relationship between inflation rates for non-voting districts and changes in the FFR is indistinguishable from zero. Importantly, for non-voting districts, the economic magnitude of the estimated coefficient is six times smaller than for voting districts. The F-test that compares the coefficients for inflation in voting and non-voting districts shows that the two coefficients are significantly different from each other (p-value=0.0332). This finding is the first indication in the literature that the voting rights of FOMC members have a profound effect on how inflation rates in members' districts affect one of the FOMC's most important decisions.

Next, we consider the role of personal income growth in voting and non-voting districts. While the coefficient is positive for voting districts and negative for non-voting districts, both coefficients are indistinguishable from zero. The F-test that compares the effects of personal income growth in voting and non-voting districts shows that the two effects are indistinguishable from each other (p-value=0.5766).

These findings are consistent with correlated personal income growth across voting and non-voting districts. Indeed, as we discussed in Section 3, during our sample period (1969-2021), the correlation of inflation rates between voting and non-voting districts is about 60%, whereas that correlation for personal income growth is about 90%. When we drop from the regression inflation and personal income growth for non-voting districts, we find that the coefficient for inflation barely changes and the coefficient for personal income growth becomes statistically significant with little change in economic magnitude (see column (3)). This finding is consistent with high correlation between personal income growth in voting and non-voting districts.

Figure 4 visualizes our main results by directly displaying the data. In panel A, we show the relationship between the inflation rate in voting districts and the change

[20] In our replication to Table 4, Column (2), of Cieslak and Vissing-Jorgensen (2021) using the same 1994-2008 sample and our dataset, our coefficient estimate is 0.089*** (SE=0.011) for the Greenbook real GDP growth forecast (compared to 0.084 in their estimation), and 0.105*** (SE=0.021) for the Greenbook national inflation forecast (compared to 0.14 in their estimation). Both estimates are within 95% confidence intervals of the estimates in their paper. Of more relevance, Appendix Table B1 reports estimation results of this general Taylor rule specification using samples that we focus on in the present research.

in the FFR in the following month. The shaded area shows 95% confidence intervals. The figure shows a clear positive relationship between the two variables. In panel B, we repeat the analysis for non-voting districts and find no relationship between the two variables.

[Insert Figure 4 here]

In column (4) of Table 6, we repeat the analysis from column (3) and augment the regression with several control variables, including national inflation and personal income growth rates, two more lags of FFRs, an indicator for the zero lower bound (ZLB) period (December 2008 to January 2016, March 2020 to December 2021, or end of sample), and interactions of this indicator variable with districts' inflation and personal income growth rates. We control for the zero-lower bound period because there is a limit on how FFRs can change during this period. As expected, we find that controlling for ZLB periods helps us identify the coefficients, and the economic magnitudes become more significant because FFRs are not sensitive to inflation during a ZLB period (as evident from the interaction term $Infl^{Vote}_{m,t-1} * I^{ZLB}_{m}$).

Finally, in column (5) we control for national GDP growth and inflation forecasts (Greenbook variables) as commonly done in the literature, which leads to a slightly smaller coefficient on the local inflation rate variable. The coefficient, however, remains large in magnitude and statistically significant at the 5% level. One possible reason for the reduction in economic magnitude is that inflation forecasts could be based on local and national economic conditions, including inflation rates, which works against us.

We perform several robustness tests. First, we show that our results are robust to dropping any of the twelve districts from the analysis. Figure 5 shows that our main finding has little sensitivity to this robustness test. This is an important robustness test not only because it shows that the results are not driven by any particular district, but also because it shows that the results are not sensitive to dropping the New York district; that district's president's voting right is not rotating. Second, we show that our main results hold in the 1994-2021 period (see Appendix Table B3), suggesting that the role of Reserve Bank presidents' voting remains relevant during the more recent period. Third, we show that the results are robust to using alternative constructions of district-level inflation and real PI growth rates. As explained in Appendix A, for five districts (New York, Richmond, Chicago, Dallas, San Francisco), there are multiple MSA-level CPI data series within the same district. We obtain all these additional MSA-level CPI data as well as the corresponding population data and then calculate the MSA population-weighted average inflation rates for each of these five districts.

The results are robust to using these MSA population-weighted inflation rates (see Appendix Table B4) and two individual alternative cases for San Francisco and Dallas districts (see Appendix Tables B5 and B6). Regarding real PI growth rates, while we calculate district-level real PI growth rates using all states covered in the same district in our main analysis, we also construct alternative district-level real PI growth rates using all states covered in the same district but do not overlap in other districts. The results are robust (see Appendix Table B7). Finally, we show that the results hold and even become stronger when we replace the main outcome with a categorical variable that captures the direction of the change in the FFR (see Appendix Table B8). Specifically, we define the outcome variable $I_{\Delta FFR_m}$ to be +1 if $\Delta FFR_m > 0$, 0 if $\Delta FFR_m = 0$, and -1 if $\Delta FFR_m < 0$. This finding shows that in contrast to inflation in voting districts, inflation in non-voting districts not only does not affect the size of the FFR change, but also does not affect the direction of the FFR change.

4.3. Do Prices Reflect the Role of Local Economic Conditions in FOMC Decisions?

In the previous section, we showed that the voting rights of Reserve Bank presidents have a profound effect on how inflation rates in Reserve Bank districts affect FOMC decisions. In this section, we test whether market participants realize that inflation rates in voting districts have a significant effect on the FFR. If market participants understand that the decisions of FOMC members depend in part on economic conditions in voting districts, the relationship between FF futures rates and districts' economic conditions should be stronger for voting districts than for non-voting districts. To perform this test, we replace changes in Federal funds rates from last meeting $m-1$ to this meeting m in our regression (2) with changes in the average Federal funds futures rate, Δf_m. A detailed description of this variable is available in Section 3.

The results are reported in Table 7. Column (1) shows that the previous month's national inflation rate is a positive predictor of an increase in FF futures rates. In contrast, the personal income growth rate is not a significant predictor of changes in FF futures rates. When we decompose the national inflation rate into the inflation rate for voting and non-voting districts, we find that the inflation rate for voting districts has a significant effect on FF futures rates. The results in column (2) show that a one standard deviation (SD) increase in a voting district's inflation rate in the last month leads to a 0.26 SD or 7.7 basis point increase in the FF futures rates, significant at the 1% level. In contrast, there is no such relationship for non-voting districts:

the relationship between the inflation rate for non-voting districts and changes in FF futures rates is economically small and statistically indistinguishable from zero. The F-test that compares the effects of inflation in voting and non-voting districts shows that the two effects are significantly different from each (p-value=0.0707). We find no relationship between personal income growth in voting and non-voting districts and FF futures rates. Columns (3)-(5) exhibit isomorphic results as before.

[Insert Table 7 here]

In sum, our results so far indicate that not only do voting districts' average inflation rates exhibit a stronger effect on FFR decisions, but also investors realize the importance of disaggregating national inflation rates and taking into account the governance structure of the FOMC.

5. The Economic Mechanism: The Governance Structure of the FOMC

In this section, we provide evidence supporting the role of Reserve Bank presidents' voting rights in shaping the FOMC's decisions. First, we consider voting decisions and evaluate the relationship between economic conditions in districts and voting decisions by districts' representatives at FOMC meetings. Second, we directly examine FOMC transcripts and test whether voting districts are more likely to be discussed during FOMC meetings than districts that do not have voting rights. Such relationships can shed light on how voting rights at FOMC meetings result in a greater emphasis on voting districts, giving those districts more weight in FOMC decisions.

5.1. Voting and Local Economic Conditions

In this section, we study how FOMC members vote and whether their voting decisions are affected by the economic conditions in their districts. In particular, we focus on dissent decisions at FOMC meetings because these are clearly observable deviations from the majority's opinion. Specifically, for each voting district president i at FOMC meeting m, we construct the following variable: $Dissent_m^i$ equals one if FOMC member i is a dissenter at meeting m and zero otherwise. We then estimate the following regression:

$$\begin{aligned} Dissent_m^i &= \alpha_{g(i)} + \alpha_m + \alpha_i + \beta_1 \text{Infl}_{m,t-1}^i + \beta_2 \text{rgPI}_{m,t-1}^i \\ &+ \gamma_1 \text{Infl}_{m,t-1}^{US} + \gamma_2 \text{rgPI}_{m,t-1}^{US} + \varepsilon_m^i, \end{aligned} \tag{3}$$

where $\alpha_{g(i)}$ is district fixed effects, α_m is meeting fixed effects, and α_i is person fixed effects. All other variables are as defined in Equation (2).

In addition to the $Dissent_m^i$ variable, we consider the direction of the dissent. Specifically, we replace $Dissent_m^i$ in Equation (3) with $Tighter_m^i$. This variable equals one if voting president i is a dissenter and votes for a tighter monetary policy decision during the roll call at meeting m (i.e., votes for a larger interest rate increase or a smaller interest rate cut) and zero otherwise. We also consider $Easier_m^i$ variable, which equals one if voting president i is a dissenter and votes for an easier monetary policy decision at meeting m and zero otherwise.

The results are reported in Table 8. Columns (1) through (3) include district and voting member fixed effects and control for the national inflation and personal income growth rates. Therefore, the coefficients on variables measuring local economic conditions in presidents' districts reflect the effect of *local* economic conditions in these districts on presidents' voting decisions.

[Insert Table 8 here]

The results show that a higher inflation rate in a president's district predicts a significantly higher likelihood of dissent in the direction of tighter monetary policy. In other words, presidents in districts with inflation rates that are higher than other districts or the aggregate level are more likely to dissent and vote for a tighter policy. In economic magnitude, a one standard deviation (SD) increase in voting-district inflation in the preceding month predicts a 1.1% increase in the likelihood of a tighter dissent decision, which is sizable given that a tighter dissent decision from a Reserve Bank president only occurs at a 6% likelihood (see Table 2).

Our findings reveal an asymmetry in whether the dissent is in the direction of tighter or easier monetary policy. Specifically, we find that local inflation has an effect on dissent in one direction only: towards tighter monetary policy. One potential explanation for this finding is that when local inflation makes Reserve Bank presidents advocate for easier monetary policy, they can convince other FOMC members to adopt such a policy and therefore no dissent is necessary. In contrast, when local inflation makes Reserve Bank presidents advocate for tighter monetary policy, they cannot convince other FOMC members to adopt such a policy, so they decide to dissent.

Next we consider the role of PI growth in shaping dissent decisions. First, we observe that when national PI growth increases, FOMC members are more likely to dissent. There is also an indication that FOMC members are more likely to dissent in the direction of tighter monetary policy (column (1)), though the effect is insignificant. Thus, presidents do take a tighter policy direction when national economic growth strengthens. Interestingly, the coefficient on local PI growth indicates that higher local PI growth leads to a lower likelihood of the president in that district dissenting in the direction of tighter monetary policy. Therefore, the evidence indicates that national and local PI growth have opposite effects on how district presidents vote, suggesting that presidents are not likely to promote a tighter monetary policy when economic growth in their districts strengthens but do so when economic growth strengthens in other districts.

In columns (4) through (6), we report the results for a specification that replaces district fixed effects with meeting fixed effects, implying that we only use variation withing a meeting. The inclusion of meeting fixed effects also implies that we do not need to control for the national inflation rate and personal income growth rate. We find that the results remain robust when we use variation in local economic conditions across five voting presidents at a meeting.

5.2. Textual Analysis

In the previous section, we show that local economic conditions affect how presidents of Reserve Banks vote. In this section, we present an analysis of FOMC transcripts to support our conjecture that the voting rights of reserve bank presidents contribute to the effect economic conditions in those presidents' districts have on the aggregate U.S. monetary policy. Under this hypothesis, one would expect establishments and organizations from districts with voting rights to be mentioned and discussed more often than those from districts without voting rights.

We begin the analysis by providing two specific examples from district presidents from the same district (San Francisco), separated by 25 years, showing how they backed up their voting decisions with arguments about their districts. In the first case, Mr. Balles voted for a tighter policy, and in the second case, Mr. Parry voted for an easier policy. These words are from a single block of their speech, rather than an assembly of multiple blocks of their speech during the meeting.[21] To conserve space, we use San Francisco as an example, but we do find a non-trivial amount of evidence from other districts as well.

1. **September 18, 1979; John J. Balles; Dissented and voted for a tighter policy.** *"Well, in addition to the Sunbelt, **the area west of the Rockies** is not feeling very much if any recession yet. Aerospace, electronics, and agriculture in*

[21] Here are the exact transcript links: https://www.federalreserve.gov/monetarypolicy/files/FOMC19790918meeting.pdf, pages 27-28; https://www.federalreserve.gov/monetarypolicy/files/FOMC20030625meeting.pdf, pages 91-93.

general are all quite strong. One indication is that the [volume of] help wanted ads in the ***Los Angeles Times*** *is almost unreal... In addition to the input that we bring to these meetings and the usual sources of our own research staff and directors, last Friday when* ***Vice Chairman Schultz*** *visited us in* ***San Francisco*** *we called in a special small group of bankers, businessmen, and academicians for a very frank exchange of views. We sounded them out about their feelings on the economy and on Fed policy, and I must say, Fred, that I thought the reactions were quite candid and somewhat humiliating in a way. The bankers generally expressed the view that as yet there's very little evidence that the high level of interest rates is having any significant total effect on cutting off credit demand... So I lean toward the view that we may have to use monetary policy as the principal weapon to break inflationary expectations and to get some deceleration in the actual rate of inflation.* ***Our directors*** *clearly voted to increase the discount rate to reinforce what they thought should be a further snugging up in our efforts to get the rate of growth in the aggregates down somewhat."*

2. **June 24-25, 2003; Robert T. Parry; Dissented and voted for an easier policy.** *Thank you, Mr. Chairman. The* ***Twelfth District*** *economy has shown little sign of ending its lull. Consumer spending did not pick up much as the conflict in Iraq subsided, and it even weakened a bit in some areas. Many retailers have been struggling with thin margins, especially in* ***Washington*** *State and* ***Oregon****, which have had the highest unemployment rates in the nation. In* ***Washington****,* ***Boeing****'s production of commercial aircraft has dropped to its lowest levels since the mid-1990s, and the state has offered* ***Boeing*** *substantial financial incentives to produce its newest commercial aircraft there rather than in one of the numerous competing states. The District manufacturing sector more generally has been struggling as well... The depth of the job losses in some areas is startling. In the* ***San Jose*** *MSA, which contains* ***Silicon Valley****, employment has fallen 18 percent since its peak in late 2000; and the overall job losses in the* ***San Francisco Bay*** *area rival* ***southern California****'s losses during its economic doldrums in the first half of the 1990s... Overall, we face considerable uncertainty about the future strength of the economy. a strong likelihood of excess capacity continuing through next year even if the economy does pick up steam. And we have low inflation. We believe this combination of considerations makes a strong case for an easing of policy at this meeting. Thank you."*

Next, we perform a descriptive analysis of the relationship between voting rights and mentions of districts' keywords. A district's keywords include geographical features, federal agencies, universities, well-known businesses, and newspapers in that district.[22] Importantly, as mentioned in Section 3, a transcript consists of words spoken by governors, words spoken by presidents, and words spoken by others (staff). We focus on the first two groups, which implies three overall word samples to be used when searching for district keywords: words from governors and presidents, words from governors, and words from district presidents.[23]

Figure 6 shows the average number of keywords that can be linked to districts with and without voting rights during our sample periods. Dark (with voting rights) and light (without voting rights) lines indicate that, during most of the sample period, districts with voting rights are more frequently mentioned in transcripts than districts without voting rights. This is true regardless of whether we consider governors or presidents, and is a quite consistent pattern over time. This is the first indication of a positive relationship between whether a president of a Reserve Bank has voting rights at an FOMC meeting and the attention devoted to that district at the meeting.

[Insert Figure 6 here]

To formally test the hypothesis that voting districts are being mentioned and discussed more often during FOMC meetings, we estimate the relationship between a district president's voting rights (yes=1, no=0) and the number of the district's keywords found in the transcript. Specifically, we estimate the following regression:

$$DistrictMentions_m^i = \alpha_m + \beta Vote_m^i + \varepsilon_m^i, \quad (4)$$

where $DistrictMentions_m^i$ is the word count of district i's keywords in meeting m, $Vote_m^i$ equals 1 if district i's president has a voting right in meeting m, and α_m is meeting fixed effects. The inclusion of meeting fixed effects implies that the estimates are based on within-meeting variation in how often voting and non-voting districts are mentioned. The sample covers transcripts for the 1976-2016 period. The unit of observation is meeting-district; that is, for each meeting, there are 12 data points.

The results are reported in Table 9. Columns report estimates of the same specification but using different word samples to search for district keywords. In column (1), we count keywords associated with the twelve districts using word samples from governors and presidents. We find a positive and significant relationship between

[22] The full list is available upon request.

[23] The step of identifying who spoke and in what order is a computationally intense task. An FOMC meeting transcript can be broken into about 1,500-5,000 individual speech blocks. We combine all speech blocks from the same participant (governors, presidents with or without voting rights, or other staff members in the room) to construct a word sample for each governor and president.

whether a district president has a voting right at the meeting and the number of times a keyword that is associated with that district is mentioned in the transcript by presidents or governors. Specifically, districts with voting rights have 0.803 more keywords mentioned than districts without voting rights. This is a sizable effect given that the average number of keywords used by governors and presidents is 3.66. That is, a district is 22% more likely to be mentioned if its president is a voting member of the meeting.

[Insert Table 9 here]

We next differentiate between district keywords mentioned by presidents and governors. The results in columns (2) and (5) indicate that both governors and presidents are more likely to use keywords that are associated with voting districts. For instance, districts with voting rights have about 0.367 (0.436) more keywords mentioned by governors (presidents) than districts without voting rights. This is an economically sizable result, indicating that districts with voting rights are 50% (15%) more likely to be mentioned by governors (presidents) than those without voting rights. The results for governors are particularly interesting, because governors' terms are relatively long (up to 14 years). This means that they actively change the content of their speech or comments during an FOMC meeting when a district's status changes from voting to non-voting. This pattern seems to be robust, based on the actual data as displayed in Figure 6 (last plot).

Next, we consider presidents only and confirm that *voting* presidents use keywords that can be linked to voting districts. That is, we want to show that the results in column (5) cannot be attributed to non-voting presidents mentioning voting districts. To perform this test, we focus on transcript sections linked to voting and non-voting presidents and check which group is more likely to use keywords associated with voting districts. The results are reported in columns (6) and (7). We observe that voting (non-voting) presidents are more (less) likely to use keywords that can be linked to voting districts. This finding supports the idea that district presidents with voting rights talk about their districts and that governors respond to their arguments.

Overall, the results point to an unambiguous positive effect of districts' voting rights at FOMC meetings on the number of times these districts are discussed during FOMC meetings.

6. Implications

Our findings indicate that the inflation in voting districts has a significant effect on FFRs. In contrast, the inflation in non-voting districts has no significant effect on FFRs. This finding implies that the path of FFRs could significantly diverge from the path that would exist if FFR decisions took into account inflation not only in voting districts, but also in non-voting districts. In this section, we attempt to quantify potential distortions in FFRs that are induced by the allocation of voting rights to five out of twelve Reserve Banks.

We begin by investigating how large the potential distortion could be. Specifically, we consider two extreme counterfactual cases. The first counterfactual case, "Min(4)," creates an inflation series that uses the four lowest inflation numbers across eleven Reserve Bank districts. That is, in this exercise we reallocate the voting rights of the four rotating districts to the four districts with the lowest inflation rate. The second counterfactual case, "Max(4)," always uses the largest four inflation numbers.

The left panel of Figure 7 shows the difference between the counterfactual inflation rates and the actual voting districts' inflation rates, scaled by the standard deviation of the voting districts' inflation rates. For demonstration purposes, we plot the yearly average. The panel indicates that if the four votes are allocated to districts with the lowest (highest) inflation rates, the distortion in the inflation rate can exceed one standard deviation of the voting districts' inflation rates. Thus, the allocation of voting rights to only a few Reserve Banks can lead to potentially meaningful distortions in FFRs.

[Insert Figure 7 here]

In the next step, we use the existing model estimates to compute the implied changes in FFRs given counterfactual inflation series. Specifically, given the estimates in Table 6, Column (2), we find that 1 SD in the voting district inflation rate causes an 11.5 basis point increase in ΔFFR. We fix the other coefficient estimates and other data inputs of the estimated regression, and replace the actual voting district inflation series ($Infl^{Vote}_{m,t-1}$) with the counterfactual inflation series. The counterfactual path of ΔFFR can be computed, and as a result, the target rate can be computed.

The right panel of Figure 7 translates the distortions in inflation rates into distortions in FFRs, each period, by multiplying them by 11.5 basis points. The evidence in the right panel shows that distortions can be economically meaningful. For instance, "10 bps" on the y-axis of the right panel implies that the ΔFFR would have gone higher by 10 basis points, compared to the actual ΔFFR, had this meeting used the largest four inflation rates to make the decision.

While the analysis in Figure 7 implies that a distortion to any particular FFR decision can be large, there is a possibility that these distortions cancel out when one considers a path-dependent of FOMC decisions in time series. Moreover, the most important counterfactual – with clear policy implications – would be an equal-weighted case that gives all districts an equal number of votes. In fact, the U.S. monetary policy decision committee in 1930 and 1933 imposed equal weights across all twelve districts.[24] The Banking Act of 1935 (amended again in 1942) superseded this arrangement by creating the FOMC's modern structure and introducing the rotation. We therefore analyze the counterfactual path of target rates under the assumption that voting rights are assigned to all Reserve Bank presidents, *equally*. In that counterfactual, FOMC decisions are based on the equal-weighted inflation rates of all twelve districts.

Figure 8 presents the results. The time series in this plot is the difference between the counterfactual target rate series and the actual target rate series, expressed in basis points. We find that the path of the target rate would have been different if all districts affected FOMC decisions equally. For instance, the results suggest that target rates would have been higher during the pre-Global Financial Crisis if economic conditions in all districts had been taken into account equally. Importantly, the results show that voting-related distortions to FOMC decisions do not cancel out after two or three years. In fact, under our estimation, it can take 15 to 20 years to absorb such voting-related distortions in the system.

[Insert Figure 8 here]

7. Conclusion

In this paper, we show that economic conditions in Reserve Bank districts affect the FFR only when those Banks' presidents hold voting seats at FOMC meetings. Market participants understand this and price the effect of local economic conditions on FOMC decisions. To provide more direct evidence of this voting mechanism, we use a hand-collected dataset that tracks the voting decisions of each FOMC member and show that voting presidents dissent based on economic conditions in their districts. Moreover, Reserve Bank presidents' districts are more likely to be mentioned in FOMC transcripts than are the districts of non-voting presidents. Our empirical strategy relies on the exogenous rotation of voting rights between Reserve Bank presidents.

[24] See https://www.federalreservehistory.org/essays/banking-act-of-1935.

In a counterfactual analysis, we find that the path of the target rate would have been different if all districts affected FOMC decisions, and given our estimation, such voting-related distortions could take 15 to 20 years to absorb.

Our findings point to several important questions for future research. Is the existing decision-making mechanism adopted by the FOMC effective in achieving optimal macroeconomic policy? Is the balance of power between the Federal Reserve Board of Governors and Reserve Bank presidents effective in reflecting the heterogeneity in economic conditions and desired policy choices across districts? Should the standard Taylor rule equation include more granular-level economic activity measures, such as district-level measures, rather than national measures? Answers to these questions will not only contribute to academic research, but also be useful for policymakers.

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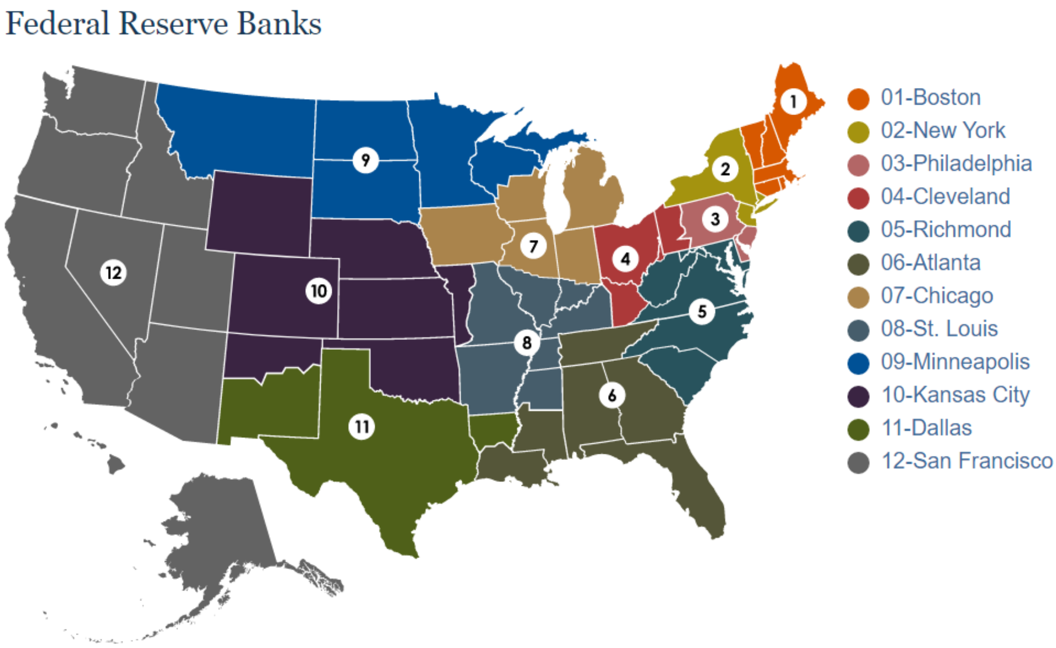

Figure 1: Federal Reserve Banks. Source: https://www.federalreserve.gov/aboutthefed/structure-federal-reserve-banks.htm

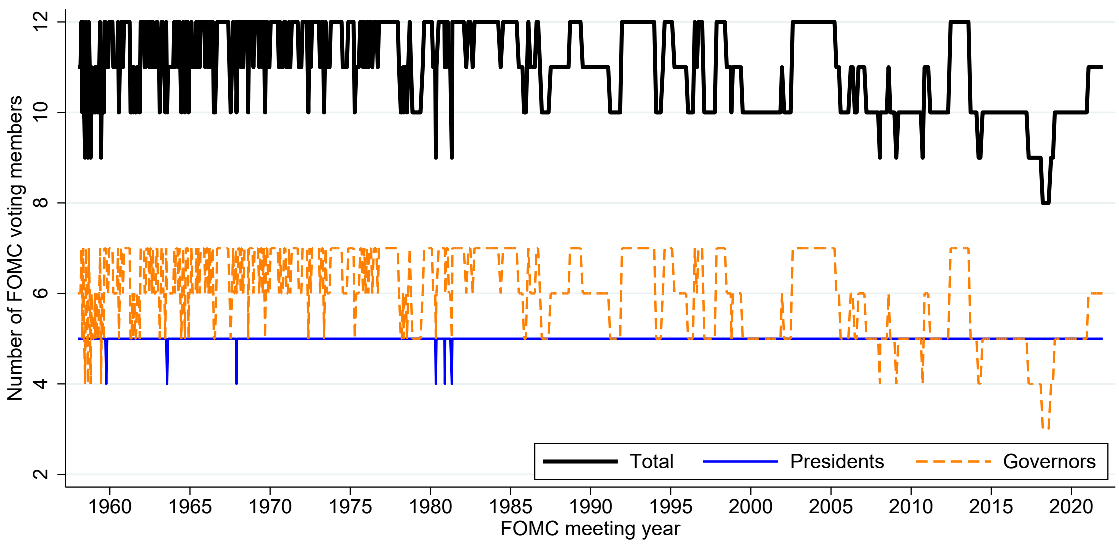

Figure 2: Number of voting members at FOMC meetings.

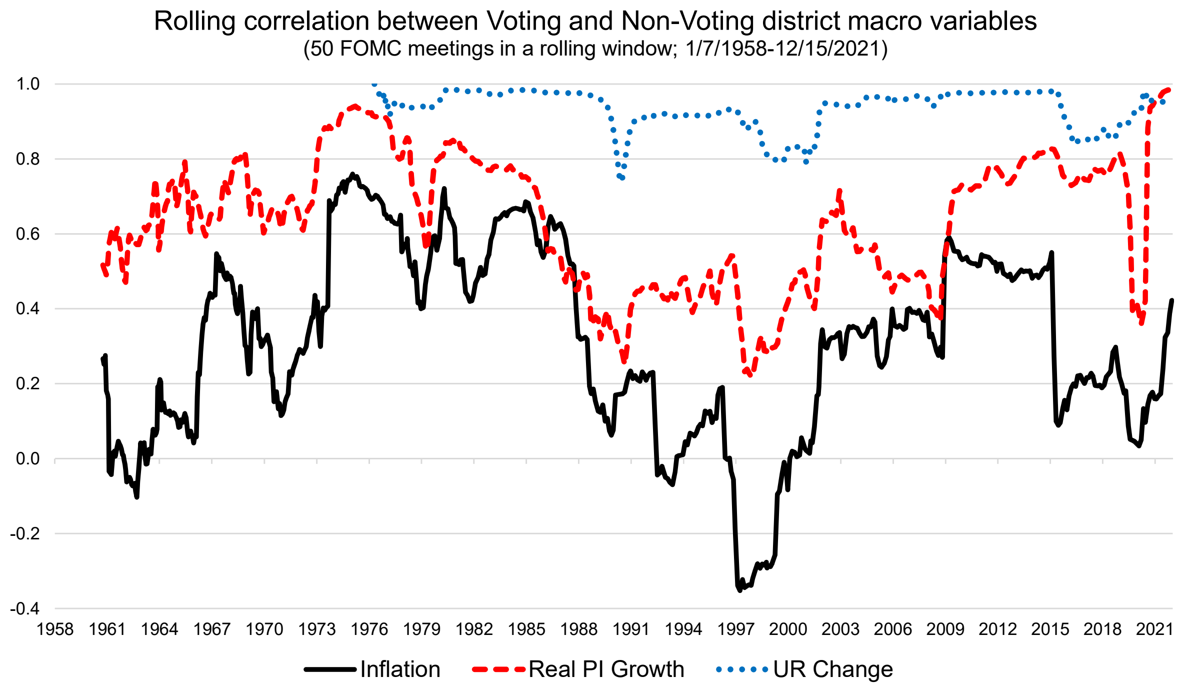

Figure 3: Rolling correlation between voting and non-voting district macro variables.

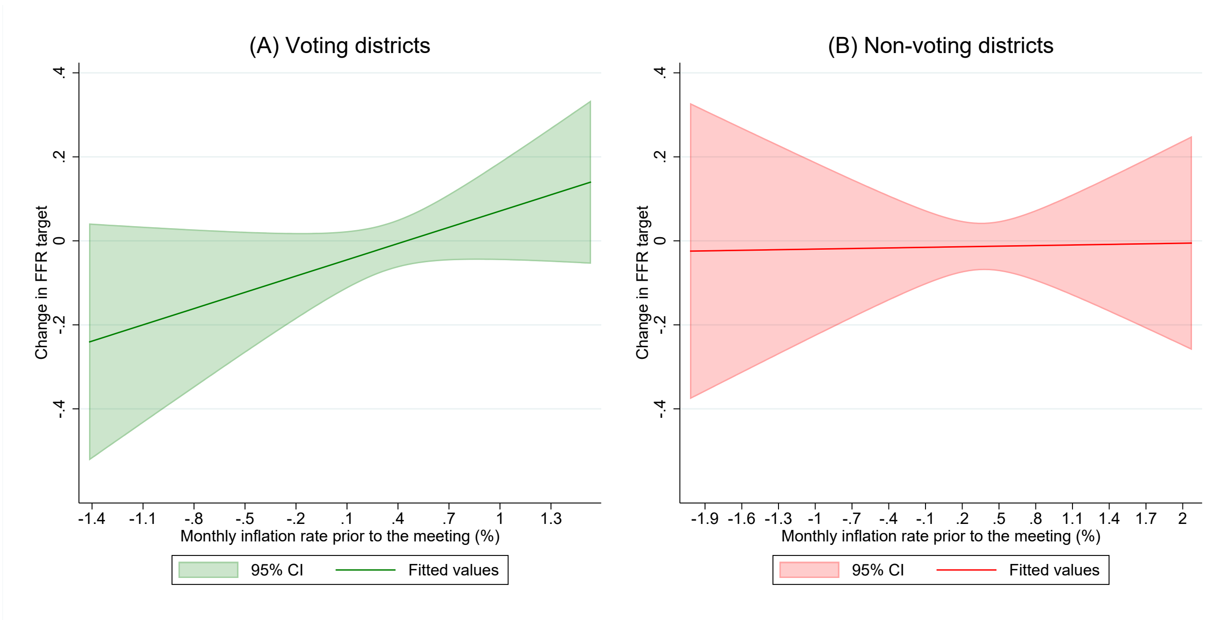

Figure 4: The relationship between changes in the FFR and the preceding month's inflation rate (voting districts in (A) and non-voting districts in (B)). This figure illustrates data used in Table 6.

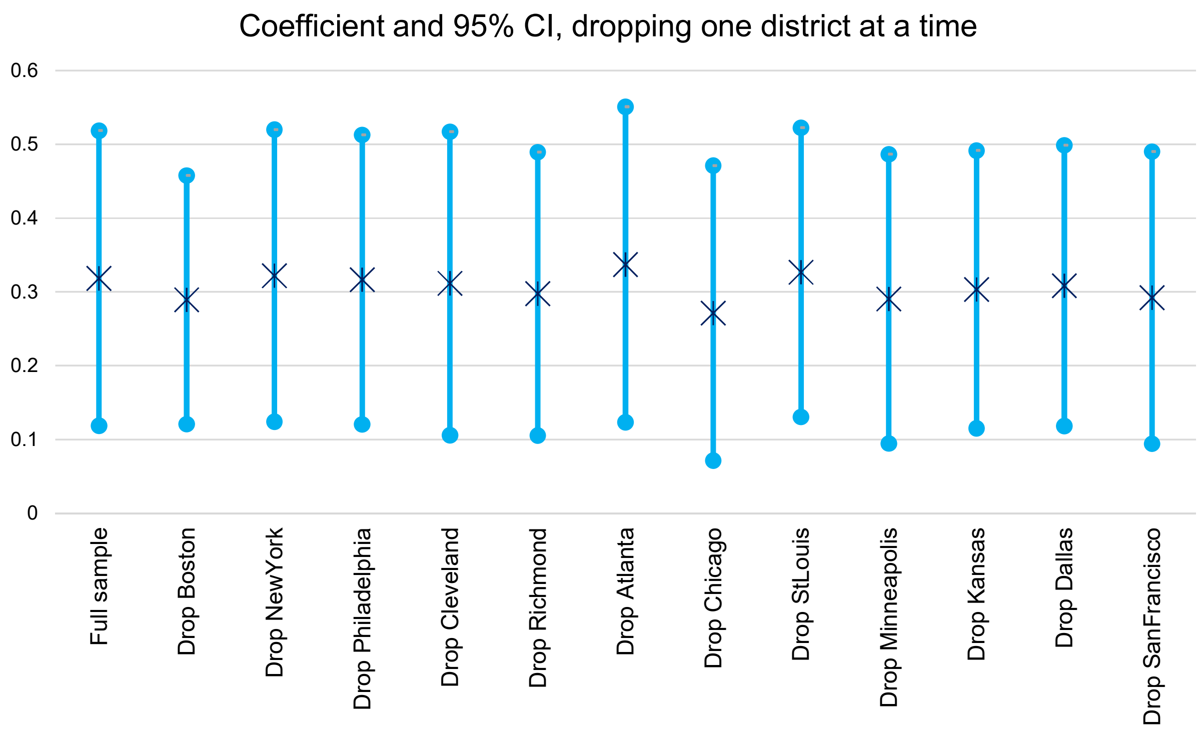

Figure 5: The role of districts: Robustness test.
In this figure we report coefficients of $Infl^{Vote}_{m,t-1}$ in the specification of column (2) in table 6 while dropping one district at a time when constructing voting and non-voting district macro variables.

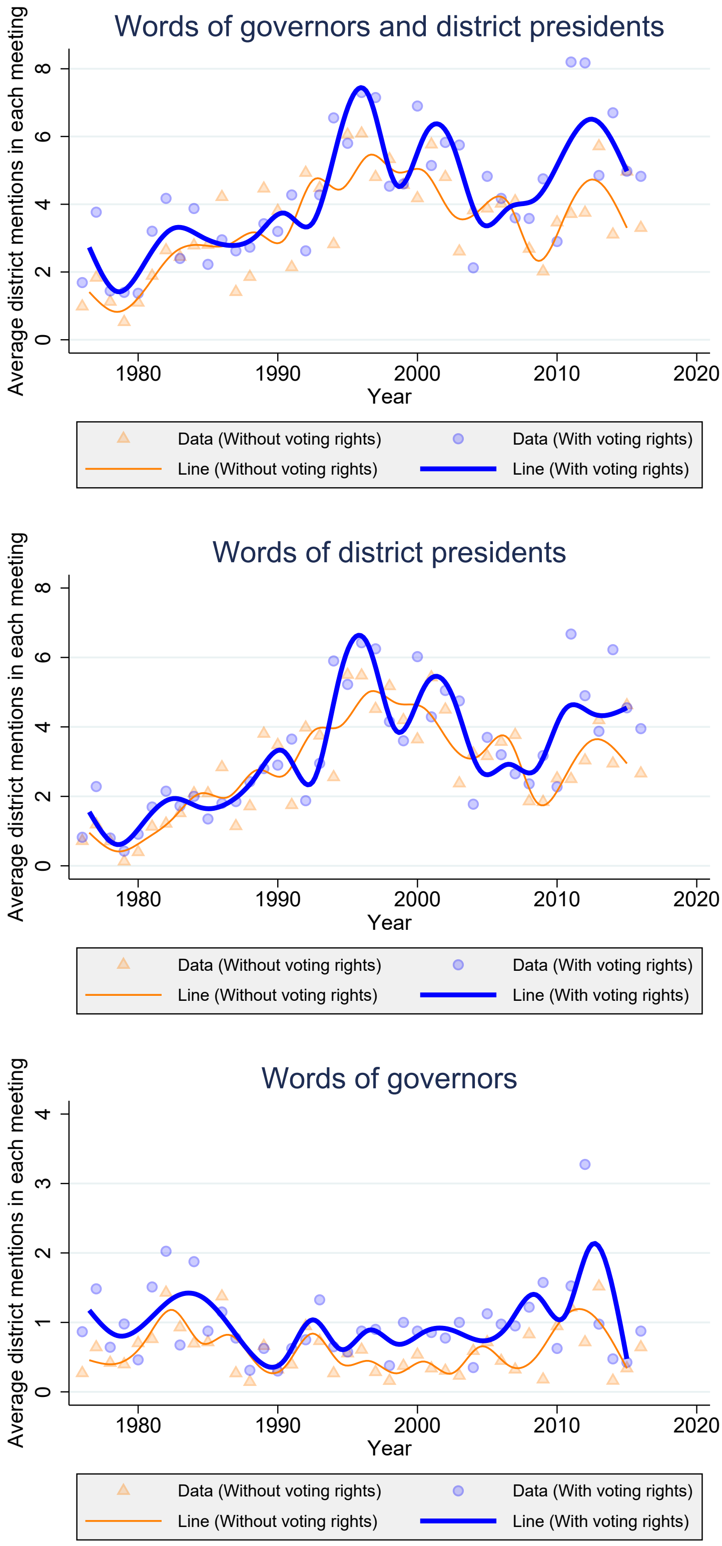

Figure 6: Mentions of voting districts and non-voting districts.

From top to bottom, we use three speech samples in order to search for district keywords (i.e., "mentions"): Words spoken by governors and presidents, words spoken by presidents, and words spoken by governors. In all three plots, the mentions of voting districts' keywords are significantly higher than those of non-voting districts' keywords, with p-values of 0.0047, 0.0443, and 0.0000 in a one-sided paired t-test. Formal regressions are presented in Table 9.

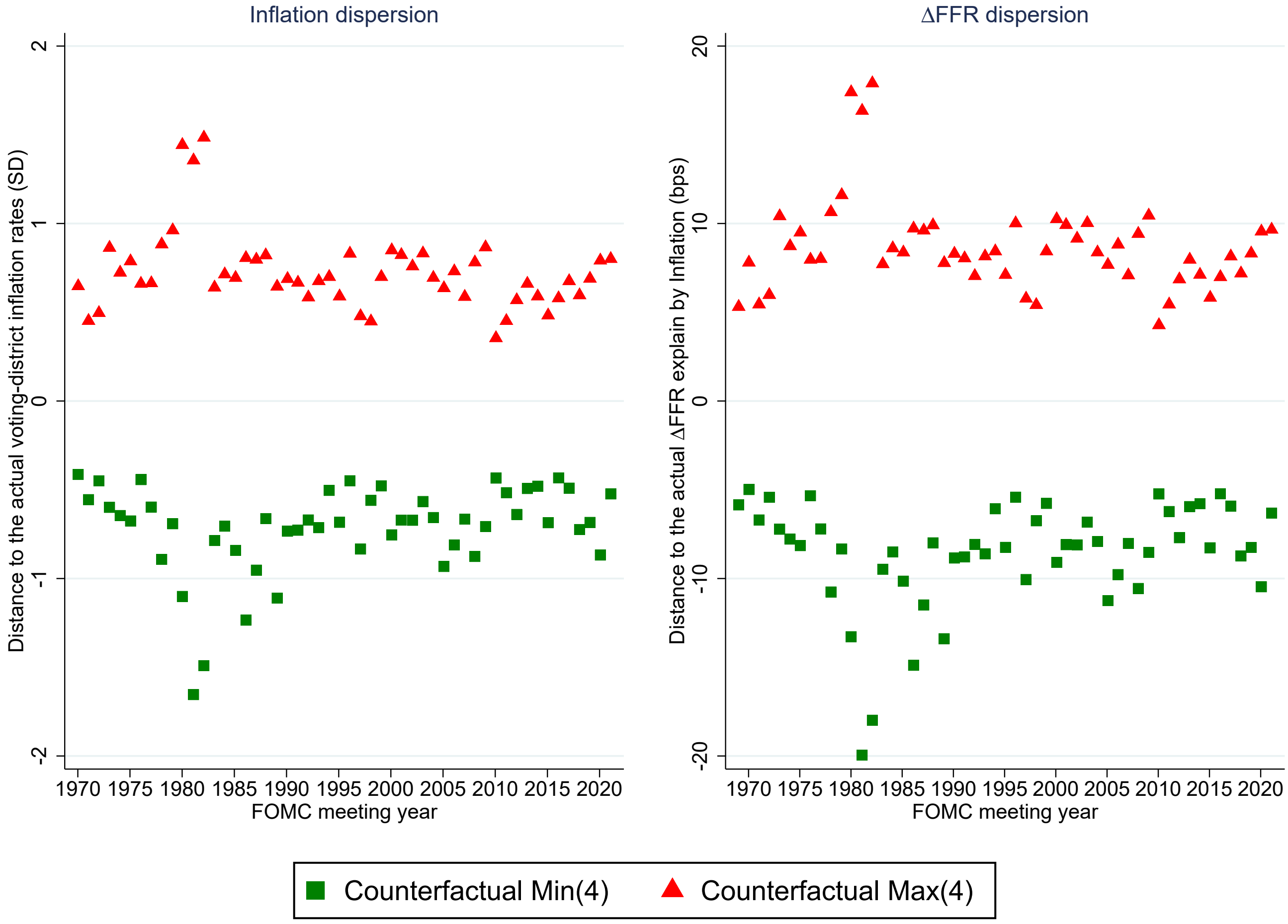

Figure 7: Economic magnitude of extreme counterfactuals.
This figure demonstrates the economic magnitude of extreme counterfactual cases. We consider two extreme counterfactual cases. In "Min(4)" case, we assume that votes are allocated to four districts with the lowest inflation in the preceding month. In "Max(4)" case, we assume that votes are allocated to four districts with the highest inflation in the preceding month. The left plot shows difference between the counterfactual inflation rates and the actual voting-district's inflation rates, divided by the standard deviation of voting-district's inflation rates. In order to translate the difference between actual and counterfactual allocation of voting rights into the difference in FFR decisions, we rely on estimates in column (2) of Table 6, which imply that a one SD change in voting-district inflation rate corresponds to 11.5 basis points change in ΔFFR. We then feed the estimated regression model with counterfactual voting-district inflation series, instead of the actual voting-district inflation series. A counterfactual path of ΔFFR and hence Target rate can be computed. The right plot shows this SD on the left plot multiplied by 11.5 basis points. For demonstration purposes, we plot yearly average in the markers.

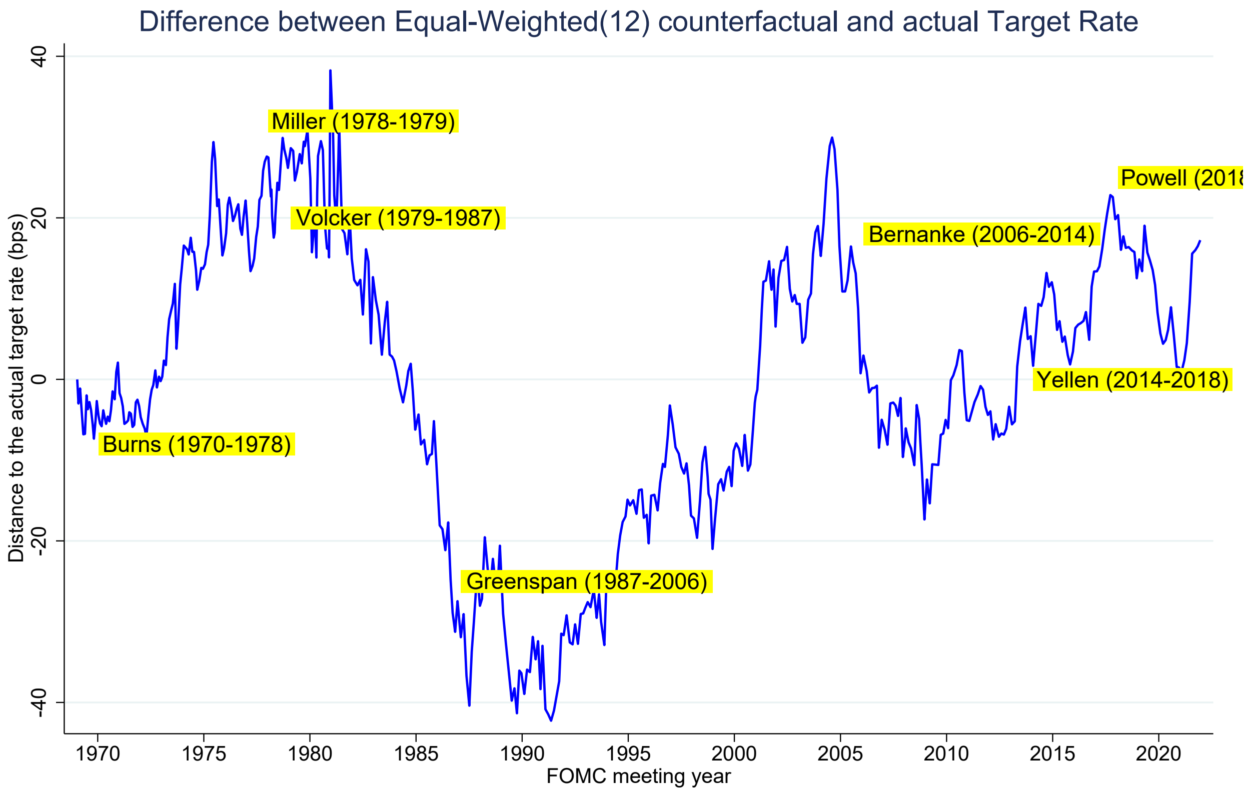

Figure 8: Historical path of FFR_m for an equal-weight counterfactual.

This figure demonstrates what the path of the target rate would have looked like if decisions used the equal weighted average of all twelve districts' inflation rates. The time series above displays the gap/difference between this equal-weight counterfactual target rate series and the actual target rate series in basis points. In order to obtain an equal-weight counterfactual target rate series, as in Figure 7, we rely on estimates in column (2) of Table 6, which imply that a one SD change in voting-district inflation rate corresponds to 11.5 basis points change in ΔFFR. We then feed the estimated regression model with counterfactual voting-district inflation series, instead of the actual voting-district inflation series. A counterfactual path of ΔFFR and hence Target rate can be computed.

Table 1: Summary statistics of meeting-level variables.

This table presents the summary statistics of meeting-level variables used for Tables 6 and 7. We denote each meeting with time stamp "m" and the most recent (last) macro variable with time stamp "$m, t-1$." ΔFFR_m, changes in the Federal funds target rate from last meeting ($m-1$) to this meeting (m). Δf_m is the change in the average implied rates from Federal funds futures contracts. Units for ΔFFR_m and Δf_m are percent per annum. Section 3 and Appendix A.4 provide more details about the data. $Infl^{US}_{m,t-1}$ is last month U.S. inflation rate. $Infl^{Vote}_{m,t-1}$ ($Infl^{NoVote}_{m,t-1}$) is the average last month inflation rate for districts with voting rights (without voting rights) during meeting m. Units are in percent. Appendix A.1 provides construction and data details. $rgPI^{US}_{m,t-1}$ is the last quarter U.S. real personal income (PI) growth. $rgPI^{Vote}_{m,t-1}$ ($rgPI^{NoVote}_{m,t-1}$) is the average last quarter real PI growth for districts with voting rights (without voting rights) during meeting m. Units are in percent. Appendix A.2 provides construction and data details. Panel A considers 1969-2021. Panel B considers 1994-2021.

Variable	Symbol	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel A: *Sample 1969-2021 (N = 488)*										
FF Target Rate Change from $m-1$ to m	ΔFFR_m	-0.013	0.63	-4.00	4.13	-0.75	-0.13	0.00	0.13	0.63
Inflation, US	$Infl^{US}_{m,t-1}$	0.36	0.34	-1.77	1.81	-0.08	0.18	0.30	0.52	1.00
Inflation, Voting District Average	$Infl^{Vote}_{m,t-1}$	0.35	0.36	-1.42	1.54	-0.18	0.14	0.32	0.54	0.99
Inflation, Non-voting District Average	$Infl^{NoVote}_{m,t-1}$	0.37	0.39	-2.02	2.08	-0.19	0.14	0.33	0.58	1.06
Real PI Growth, US	$rgPI^{US}_{m,t-1}$	0.63	1.44	-8.25	11.13	-1.41	0.19	0.66	1.18	1.99
Real PI Growth, Voting District Average	$rgPI^{Vote}_{m,t-1}$	0.63	1.43	-8.08	10.93	-1.13	0.05	0.65	1.18	2.11
Real PI Growth, Non-voting District Average	$rgPI^{NoVote}_{m,t-1}$	0.62	1.53	-8.36	11.28	-1.48	0.07	0.77	1.24	2.14
Panel B: *Sample 1994-2021 (N = 230)*										
FF Target Rate Change from $m-1$ to m	ΔFFR_m	-0.013	0.22	-1.00	0.75	-0.50	0.00	0.00	0.00	0.25
FF Futures Change from $m-1$ to m	Δf_m	-0.008	0.30	-2.13	0.67	-0.55	-0.11	0.01	0.14	0.42
Inflation, US	$Infl^{US}_{m,t-1}$	0.19	0.26	-1.77	0.88	-0.19	0.06	0.19	0.32	0.58
Inflation, Voting District Average	$Infl^{Vote}_{m,t-1}$	0.17	0.30	-1.42	1.05	-0.34	0.03	0.17	0.36	0.58
Inflation, Non-voting District Average	$Infl^{NoVote}_{m,t-1}$	0.21	0.32	-2.02	1.10	-0.27	0.05	0.21	0.38	0.67
Real PI Growth, US	$rgPI^{US}_{m,t-1}$	0.54	1.85	-8.25	11.13	-1.46	0.08	0.61	1.12	1.90
Real PI Growth, Voting District Average	$rgPI^{Vote}_{m,t-1}$	0.56	1.82	-8.08	10.93	-1.55	0.13	0.61	1.06	2.50
Real PI Growth, Non-voting District Average	$rgPI^{NoVote}_{m,t-1}$	0.53	1.94	-8.36	11.28	-1.85	0.00	0.64	1.10	2.06

Table 2: Summary statistics for panel variables.

This table presents the summary statistics of our various panel variables used for Tables 8 and 9. Panels A presents summary statistics of panel variables in Table 8. $Dissent_m^i$ equals one if voting participant i dissented in meeting m. $Tighter_m^i$ ($Easier_m^i$) equals one if voting participant i dissented and proposed a tighter (easier) policy in meeting m; zeros otherwise. Both panels use the longest sample. Panel A considers voting presidents, as in our analysis. Panel B presents summary statistics of panel variables in Table 9, where data are organized at the meeting-district level. Given that transcripts have a 5-year delay, the longest transcript sample we obtain is from 4/20/1976 to 12/14/2016, a total of 357 meetings. For each meeting, there are 12 data points representing the 12 districts, bringing the total N to 4,284 (357×12). $DistrictMentions_m^i$ denotes the word counts of district i's keywords (geographical features, federal banks, local businesses, universities, newspapers) during meeting m. Note that a transcript consists of words spoken by governors, words spoken by district presidents, and words spoken by others (staff). We focus on word samples from the first two groups, and construct $DistrictMentions_m^i$ measures of interest. Lastly, $Vote_m^i$ equals one if district i has voting rights during meeting m.

Variable	Symbol	Mean	SD	Min	Max	5th	25th	50th	75th	95th
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
***Panel A:** Dissent regression sample at the Meeting-Voting President level (N = 2,959)*										
Dummy: Dissent=1	$Dissent_m^i$	0.08	0.27	0	1	0	0	0	0	1
Dummy: Dissent and propose a tighter policy=1	$Tighter_m^i$	0.06	0.23	0	1	0	0	0	0	1
Dummy: Dissent and propose an easier policy=1	$Easier_m^i$	0.01	0.11	0	1	0	0	0	0	0
***Panel B:** Textual analysis sample at the Meeting-District level (N = 4,284)*										
District mentions, Governors and Presidents	$DistrictMentions_m^i$	3.66	4.29	0	40	0	1	2	5	12
District mentions, Governors	$DistrictMentions_m^i$	0.74	1.57	0	23	0	0	0	1	4
District mentions, Governors-Chair	$DistrictMentions_m^i$	0.35	1.04	0	18	0	0	0	0	2
District mentions, Governors-Non-Chairs	$DistrictMentions_m^i$	0.38	1.00	0	16	0	0	0	0	2
District mentions, Presidents	$DistrictMentions_m^i$	2.92	3.71	0	35	0	0	2	4	10
District mentions, Voting Presidents	$DistrictMentions_m^i$	1.24	2.47	0	30	0	0	0	1	6
District mentions, Non-voting Presidents	$DistrictMentions_m^i$	1.68	2.77	0	30	0	0	1	2	7
Dummy: Voting=1	$Vote_m^i$	0.42	0.49	0	1	0	0	0	1	1

Table 3: Correlations among U.S., voting, and non-voting district macro variables.

This table presents the correlation matrices of meeting-level U.S., voting, and non-voting district macro variables used in our main specification. "$Infl$" indicates inflation rates, "$rgPI$" indicates real PI growth, and "$chgUR$" indicates changes (first differences) in unemployment rates. See detailed variable constructions in Appendix A. Superscript "US" indicates that the U.S. aggregate value. Superscript "$Vote$" ("$NoVote$") indicates the average of voting-districts' (non-voting-districts') macro variables. See other notation details in Table 1. Panel A uses 1969-2021 (longest sample for our main specification). Panel B uses 1976-2021, given the data available for unemployment rate (source: BLS).

Panel A: *1969-2021 (N = 488)*

	$Infl^{US}_{m,t-1}$	$Infl^{Vote}_{m,t-1}$	$Infl^{NoVote}_{m,t-1}$	$rgPI^{US}_{m,t-1}$	$rgPI^{Vote}_{m,t-1}$	$rgPI^{NoVote}_{m,t-1}$
$Infl^{US}_{m,t-1}$	1					
$Infl^{Vote}_{m,t-1}$	0.851***	1				
$Infl^{NoVote}_{m,t-1}$	0.938***	0.615***	1			
$rgPI^{US}_{m,t-1}$	0.003	-0.007	0.008	1		
$rgPI^{Vote}_{m,t-1}$	-0.012	-0.030	0.002	0.955***	1	
$rgPI^{NoVote}_{m,t-1}$	0.012	0.009	0.012	0.98***	0.877***	1

Panel B: *1976-2021 (N = 388)*

	$Infl^{US}_{m,t-1}$	$Infl^{Vote}_{m,t-1}$	$Infl^{NoVote}_{m,t-1}$	$rgPI^{US}_{m,t-1}$	$rgPI^{Vote}_{m,t-1}$	$rgPI^{NoVote}_{m,t-1}$	$chgUR^{US}_{m,t-1}$	$chgUR^{Vote}_{m,t-1}$	$chgUR^{NoVote}_{m,t-1}$
$Infl^{US}_{m,t-1}$	1								
$Infl^{Vote}_{m,t-1}$	0.845***	1							
$Infl^{NoVote}_{m,t-1}$	0.93***	0.590***	1						
$rgPI^{US}_{m,t-1}$	0.026	0.014	0.03	1					
$rgPI^{Vote}_{m,t-1}$	0.008	-0.012	0.02	0.955***	1				
$rgPI^{NoVote}_{m,t-1}$	0.037	0.031	0.035	0.98***	0.876***	1			
$chgUR^{US}_{m,t-1}$	-0.005	-0.022	0.007	-0.311***	-0.306***	-0.299***	1		
$chgUR^{Vote}_{m,t-1}$	-0.02	-0.027	-0.012	-0.32***	-0.320***	-0.304***	0.982***	1	
$chgUR^{NoVote}_{m,t-1}$	0.004	-0.018	0.018	-0.3***	-0.292***	-0.291***	0.993***	0.953***	1

Table 4: Actual vs. by-law voting scheme.

This table reports estimates of a regression of a district's actual voting indicator (1 or 0) at an FOMC meeting ("$ActualVote^i_m$") on a federal-law-determined voting indicator (1 or 0) ("$ByLawVote^i_m$"). The by-law rotation scheme was designed back in 1942. The data structure is at the meeting-district level; that is, each meeting has 12 data points corresponding to 12 districts, and therefore the 1969-2021 sample in Column (1) has N=5,856 (488×12) and the 1994-2021 sample in Column (2) has N=2,760 (230×12). In Columns (3) and (4), we drop New York from each meeting, and therefore the numbers of observations are multiples of 11, instead of 12. The last two rows report the number of mismatches between actual voting and federal-law-determined voting. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	$ActualVote^i_m$			
	1969-2021	1994-2021	1969-2021	1994-2021
	(1)	(2)	(3)	(4)
$ByLawVote^i_m$	0.9297***	0.9861***	0.9169***	0.9831***
	(0.005)	(0.003)	(0.006)	(0.004)
Constant	0.0173***	0.0019*	0.0173***	0.0019*
	(0.002)	(0.001)	(0.002)	(0.001)
N	5,856	2,760	5,368	2,530
R^2	0.87	0.97	0.85	0.97
F-statistic	34,483	84,989	23,722	56,538
Without NY District			Yes	Yes
% Mismatches with 1942 and alternate member schemes	1.0%	0.1%	1.1%	0.1%

Table 5: Can districts' economic conditions predict the allocation of voting rights?

This table is a placebo test which projects whether a district's president voted (yes=1; no=0) in next year's meetings on its past economic conditions. In panel A, we use last Q4 macro variables. In panel B, we use last year macro variables. Units: quarterly percent or annual percent, respectively. The unit of observation is district-year, and therefore, N=636, 53 years $\times$ 12 districts. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	Voting Indicator {1 if a district voted in a year; 0 otherwise}					
Sample period:		1969-2021			1994-2021	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: *Predicting next year's voting using previous Q4's macro variables.*						
Q4 Inflation	0.0055		0.0154	-0.0360		-0.0214
	(0.018)		(0.020)	(0.031)		(0.041)
Q4 Real PI Growth		0.0156	0.0213		0.0293	0.0183
		(0.016)	(0.018)		(0.025)	(0.033)
Constant	0.4665***	0.4500***	0.4375***	0.4404***	0.4127***	0.4218***
	(0.021)	(0.028)	(0.032)	(0.028)	(0.040)	(0.043)
N	636	636	636	336	336	336
R^2	0.0002	0.0015	0.0024	0.0038	0.0039	0.0048
Panel B: *Predicting next year's voting using previous year's macro variables.*						
Last year Inflation	0.0094		0.0105	0.0183		0.0194
	(0.006)		(0.007)	(0.021)		(0.021)
Last year Real PI Growth		0.0024	0.0056		0.0018	0.0039
		(0.008)	(0.008)		(0.013)	(0.013)
Constant	0.4352***	0.4628***	0.4179***	0.4152***	0.4424***	0.4047***
	(0.030)	(0.028)	(0.039)	(0.044)	(0.038)	(0.056)
N	636	636	636	336	336	336
R^2	0.0035	0.0001	0.0043	0.0024	0.0001	0.0026

Table 6: Predicting changes in Federal funds rates, 1969-2021.

This table presents estimates of regression (2), in which we regress changes in FFR on recent macro variables of voting and non-voting districts, controlling for a general specification of the Taylor rule using lagged target rates and Greenbook forecasts (see Cieslak and Vissing-Jorgensen (2021)). The unit of observation is the FOMC meeting. Most variables are defined in Table 1 and Section 3. I_m^{ZLB} is a dummy variable indicating whether this period is in the zero lower bound (ZLB), which is defined as from December 2008 to January 2016 and from March 2020 to December 2021 (end of sample). $E_m(gGDP_{q0})$ is the forecast of real GDP growth (current quarter, q0) and $E_m(Infl_{q1})$ denotes GDP deflator inflation, one quarter ahead (q1). Appendix Table B1 provides our replication of the Taylor rule regression. "p-value, Infl" ("p-value, rgPI") show the p-values of an F-test with the null that the coefficients of $Infl_{m,t-1}^{Vote}$ and $Infl_{m,t-1}^{NoVote}$ ($rgPI_{m,t-1}^{Vote}$ and $rgPI_{m,t-1}^{NoVote}$) are equal. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl_{m,t-1}^{Vote}$		0.3184***	0.2885***	0.4545**	0.3799**
		(0.102)	(0.094)	(0.180)	(0.187)
$Infl_{m,t-1}^{NoVote}$		-0.0557			
		(0.109)			
$rgPI_{m,t-1}^{Vote}$		0.0423	0.0399**	0.0549	0.0294
		(0.039)	(0.018)	(0.083)	(0.084)
$rgPI_{m,t-1}^{NoVote}$		-0.0022			
		(0.043)			
$Infl_{m,t-1}^{US}$	0.2000*			-0.1468	-0.3129
	(0.121)			(0.232)	(0.228)
$rgPI_{m,t-1}^{US}$	0.0371*			0.0487	0.0455
	(0.019)			(0.101)	(0.104)
FFR_{m-1}	-0.0203	-0.0235	-0.0247*	0.1981*	0.1517
	(0.015)	(0.014)	(0.014)	(0.117)	(0.117)
FFR_{m-2}				-0.1858	-0.1777
				(0.191)	(0.186)
FFR_{m-3}				-0.0486	-0.0354
				(0.118)	(0.120)
$Infl_{m,t-1}^{Vote} * I_m^{ZLB}$				-0.5111***	-0.3548**
				(0.133)	(0.140)
$Infl_{m,t-1}^{NoVote} * I_m^{ZLB}$				0.1275	0.1828
				(0.148)	(0.145)
$rgPI_{m,t-1}^{Vote} * I_m^{ZLB}$				-0.1102*	-0.0613
				(0.059)	(0.054)
$rgPI_{m,t-1}^{NoVote} * I_m^{ZLB}$				0.0067	-0.0086
				(0.064)	(0.061)
I_m^{ZLB}				-0.0210	-0.0534
				(0.080)	(0.099)
$E_m(gGDP_{q0})$					0.0278
					(0.018)
$E_m(Infl_{q1})$					0.0824***
					(0.024)
Constant	0.0011	-0.0020	-0.0055	0.0353	-0.0865
	(0.054)	(0.055)	(0.054)	(0.081)	(0.105)
N	487	487	487	485	445
R^2	0.019	0.031	0.030	0.120	0.160
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.0332			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5766			

Table 7: Predicting changes in Federal funds futures rates, 1994-2021.

This table presents regression results of predicting changes in the average implied Federal funds futures rate across various terms using recent macro variables for the U.S., voting districts, and non-voting districts, controlling for a general specification of the Taylor rule using lagged target rates and Greenbook forecasts (see Cieslak and Vissing-Jorgensen (2021)). The unit of observation is the FOMC meeting. Variables are defined in Tables 1, 6, and Section 3. Appendix A.4 provides construction details of Δf_m. "p-value, Infl" ("p-value, rgPI") shows the p-values of an F-test with the null that the coefficients of $Infl^{Vote}_{m,t-1}$ and $Infl^{NoVote}_{m,t-1}$ ($rgPI^{Vote}_{m,t-1}$ and $rgPI^{NoVote}_{m,t-1}$) within the regression estimation are equal. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			Δf_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.2559***	0.2568***	0.3226*	0.4057**
		(0.081)	(0.074)	(0.166)	(0.177)
$Infl^{NoVote}_{m,t-1}$		0.0289			
		(0.068)			
$rgPI^{Vote}_{m,t-1}$		0.0206	0.0028	0.0318	-0.0193
		(0.031)	(0.005)	(0.067)	(0.077)
$rgPI^{NoVote}_{m,t-1}$		-0.0188			
		(0.029)			
$Infl^{US}_{m,t-1}$	0.2450***			-0.0119	-0.1347
	(0.075)			(0.151)	(0.151)
$rgPI^{US}_{m,t-1}$	0.0017			-0.0064	0.0342
	(0.005)			(0.069)	(0.086)
FFR_{m-1}	-0.0078	-0.0084	-0.0083	0.1764	-0.0711
	(0.007)	(0.007)	(0.007)	(0.129)	(0.149)
FFR_{m-2}				-0.1062	0.1100
				(0.195)	(0.213)
FFR_{m-3}				-0.0849	-0.0750
				(0.104)	(0.116)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.2687	-0.2790*
				(0.164)	(0.161)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0547	-0.0069
				(0.124)	(0.135)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.0098	0.0442
				(0.064)	(0.058)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				-0.0157	-0.0830
				(0.061)	(0.057)
I^{ZLB}_m				0.0303	0.0488
				(0.071)	(0.086)
$E_m(gGDP_{q0})$					0.0403*
					(0.024)
$E_m(Infl_{q1})$					0.1356***
					(0.042)
Constant	-0.0366	-0.0373	-0.0318	-0.0283	-0.2811***
	(0.031)	(0.032)	(0.031)	(0.066)	(0.094)
N	226	226	226	226	186
R^2	0.050	0.072	0.069	0.12	0.20
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.0707			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5061			

Table 8: Dissent decisions at FOMC meetings and local economic conditions.

This table presents the results of regressing an indicator of voting dissent on president's corresponding (local) macro variables, at the meeting-member level, using our largest sample (1958-2021). Voting dissent is a vote against the majority of FOMC members. We consider three dissent decision variables: (1) $Dissent^i_m$ is 1 if the voter dissented; (2) $Tighter^i_m$ is 1 if the voter dissented and proposed a tighter policy; (3) $Easier^i_m$ is 1 if the voter dissented and proposed an easier policy; all three variables are 0 otherwise. Dissent data collection and local macro variable construction are explained in detail in Section 3 and Appendix A. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	$Dissent^i_m$	$Tighter^i_m$	$Easier^i_m$	$Dissent^i_m$	$Tighter^i_m$	$Easier^i_m$
	(1)	(2)	(3)	(4)	(5)	(6)
$Infl^i_{m,t-1}$	0.0379**	0.0260*	0.0043	0.0405**	0.0174	0.0109
	(0.017)	(0.015)	(0.005)	(0.020)	(0.017)	(0.007)
$rgPI^i_{m,t-1}$	-0.0146***	-0.0101**	-0.0015	-0.0106*	-0.0095*	-0.0009
	(0.005)	(0.004)	(0.002)	(0.006)	(0.005)	(0.002)
$Infl^{US}_{m,t-1}$	-0.0129	0.0034	0.0018			
	(0.023)	(0.020)	(0.008)			
$rgPI^{US}_{m,t-1}$	0.0131**	0.0064	-0.0005			
	(0.006)	(0.005)	(0.002)			
Constant	0.0715***	0.0490***	0.0121***	0.0736***	0.0574***	0.0098***
	(0.008)	(0.006)	(0.003)	(0.009)	(0.008)	(0.004)
N	2,959	2,959	2,959	2,959	2,959	2,959
R^2	0.15	0.15	0.06	0.43	0.43	0.34
District FE	Yes	Yes	Yes	No	No	No
Personal FE	Yes	Yes	Yes	Yes	Yes	Yes
Meeting FE	No	No	No	Yes	Yes	Yes

Table 9: Are voting districts more frequently mentioned in the meeting?

This table presents the results of a regression of the number of district mentions in a meeting on whether the district has a vote ("$Vote_m^i$"). The sample period is from 4/20/1976 to 12/14/2016, a total of 357 meetings. For each meeting, there are 12 data points representing the 12 districts, bringing the total N to 4,284 (357×12). We construct seven word samples spoken by various FOMC members in which we search for district keywords: (1) governors and presidents; (2) governors only; (3) chair only; (4) non-chair governors only; (5) presidents only; (6) voting presidents; and (7) non-voting presidents. District mentions for each meeting-district are the word counts for district keywords, and these keywords include local geographical features, federal agencies, universities, (well-known) businesses, and newspapers in that district. All regressions include meeting fixed effects. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	$DistrictMentions_m^i$						
Speech sample:	Governors and Presidents	Governors (All)	Governors (Chair)	Governors (Non-Chair)	Presidents (All)	Presidents (Voting)	Presidents (Non-Voting)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Vote_m^i$	0.8029***	0.3674***	0.1549***	0.2125***	0.4355***	1.9198***	-1.4843***
	(0.126)	(0.050)	(0.033)	(0.032)	(0.105)	(0.075)	(0.071)
Constant	3.3227***	0.5846***	0.2904***	0.2942***	2.7381***	0.4428***	2.2953***
	(0.073)	(0.025)	(0.018)	(0.015)	(0.064)	(0.026)	(0.058)
N	4,284	4,284	4,284	4,284	4,284	4,284	4,284
R^2	0.22	0.15	0.13	0.16	0.26	0.30	0.27
Meeting FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Appendices

A. Data Appendix

This appendix section complements and provides more details on the material covered in Section 3.

A.1. Local Inflation Measure

Sources. We investigate Reserve Banks' websites and find no readily-available inflation rate or CPI time-series data for any of the 12 districts or any state. Next we turn to the Bureau of Labor Statistics (BLS); while the CPI is not reported for each state, the BLS reports "metropolitan statistical area" (MSA) CPI data for all urban consumers. Table A1 summarizes (1) state coverage as defined in each district – note that it does not always fall along state lines; (2) area CPI data from the BLS that is closely related to the state; (3) time-series coverage in terms of longitude and frequency. There are two important observations about data availability that motivated our discipline below. One, we can find CPI data for at least one valid area for each district, and these are metropolitan statistical areas given BLS's definition. Two, for those districts with multiple metropolitan statistical areas, we primarily consider the area where the Head Office of the Federal Reserve Bank resides, which also typically has the longest historical sample among these areas in the same district. More specifically, we prefer to use the CPI series with as much monthly data as possible, given that the FOMC meets monthly or bimonthly, and as a result, annual inflation data are not useful. If the MSA of the Head Office does not have a sample that is long or high-frequency enough, we use the next best MSA data in this district based on population data (`https://en.wikipedia.org/wiki/Metropolitan_statistical_area`).

The colored lines in Table A1 indicate the representative CPI choices for each district. Using their best choices, there are four districts with a long series of annual or (smoothed) semi-annual data: Atlanta (1987-1997), St Louis (1998-2017), Minneapolis (1987-2017), and Kansas City (1987-2017). Other districts have consecutive CPI data at monthly, bi-monthly, or quarterly frequency for us to use to construct inflation data.

Inflation construction. The frequency of CPI data available for each district may be different: monthly, bi-monthly, or quarterly. Given our research objective, we aim to construct monthly inflation. To achieve this, we address the data differently depending on its available frequency. For monthly CPI series, monthly inflation is the percentage change in CPI. For other frequencies, we compute the percentage change between two consecutive CPI numbers, divide the percentage change by the number of months in the gap, and then backfill. For instance, if data available at a bi-monthly frequency has a percentage change between the March and May CPI values of 0.4%, we will fill April and May inflation rates with values of 0.2%.

For the four districts with long periods of low-frequency data (Atlanta (1987-1997), St Louis (1998-2017), Minneapolis (1987-2017), and Kansas City (1987-2017), as mentioned above), we do not average over the missing months. Instead, we categorize these periods as missing because we do not know the true higher frequency dyanmics in their macro fundamentals. For example, when Atlanta is represented (voting) in an FOMC meeting but its inflation data is missing, the voting district average inflation rates prior to the meeting (as denoted by $Infl^{Vote}_{m,t-1}$) use the other three or four districts with votes. This way, we do not introduce unnecessary noise. Monthly aggregate U.S. CPI data is available from January 1947 (source: FRED).

Tables B5 and B6 show robustness results for the main test in the paper using alternative inflation measures in close cases (i.e., the San Francisco District and the Dallas District). Table B4 shows robustness results using MSA population-weighted inflation rates for districts with multiple MSA-level CPI data series.

A.2. Local Real Growth Proxy

Sources. We explore Reserve Banks' websites and the BEA to search for extensive samples of local or state-level GDP data. (The aggregate measures can be easily obtained.) The BEA indeed produces district-level or state-level GDP data (http://www.bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm); however, the earliest downloadable local GDP data starts in 2005, which can be confirmed at this website https://apps.bea.gov/regional/downloadzip.cfm or from FRED.

We aim to cover as long a time series as possible, and therefore, we use the other proxy for economic growth: Personal Income (PI). According to the BEA,[25] data for quarterly personal income by state (seasonally adjusted) start as early as 1948 for some states. The United States Regional Economic Analysis Project (US-REAP), https://united-states.reaproject.org/data-tables/quarterly-earnings-sq5/, also uses this personal income data source for regional economic growth analysis. Dataset downloads from both sources on Personal Income yield exactly the same numbers.

Real growth construction. The quarterly state-level personal income data are fully balanced. We first obtain the state-level quarterly growth rates for personal income and then create the district's average using represented state growth rates. Note that one state can belong to two adjacent districts, as districts are defined along county lines according to the Federal Reserve Act. For instance, Figure 1 shows that West Virginia belongs to both the Fourth District, Cleveland, and the Fifth District, Richmond; on the other hand, we observe only state-level personal income data. In this case, to be conservative, we include this state's growth rates when calculating both districts' growth rates. Table A2 shows the exact state composition we use when constructing our district PI growth rates. The real district PI growth rates are calculated as nominal minus the corresponding district's inflation at the quarterly frequency (see above for calculating district inflation rates). In robustness test (see Table B7), we verify that the results are not sensitive to dropping states that are used in two districts.

[25] See https://apps.bea.gov/regional/downloadzip.cfm, zip folder "Personal Income by State," Table "SQINC1__ALL_AREAS_1948_2022.csv," rows "Personal income."

Table A1: Availability of CPI data for all urban consumers from the Bureau of Labor Statistics (BLS).

District	State coverage	Best Area Data (BLS)	Coverage	
01-Boston	Maine	No		
	Massachusetts	Boston-Cambridge-Newton	1914-2022	1914-1940: Annual 1941-1952: Month 1953-1977: Quarter 1978-2022: Every other month
		Boston-Brockton-Nashua	2008-2012	Annual
	New Hampshire	Boston-Brockton-Nashua	2008-2012	Annual
	Rhode Island	No		
	Vermont	No		
	Connecticut	No		
02-New York	New Jersey (northern)	Philadelphia-Camden-Wilmington	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
		New York-Newark-Jersey City	1914-2022	1914-1940: Annual 1941-2022: Month
	Connecticut (Fairfield County)	No		
03-Philadelphia	Delaware	Philadelphia-Camden-Wilmington	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
	New Jersey (Southern)	Philadelphia-Camden-Wilmington	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
	Pennsylvania (Eastern)	Philadelphia-Camden-Wilmington	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
04-Cleveland	Midwest urban		1966-2022	1966-1977: Quarter 1978-1986: Every other month 1987-2022: Month
	Kentucky (Eastern)	Cincinnati-Hamilton	2016-2017	Semi-Annual
	Ohio	Cincinnati-Hamilton	2016-2018	Semi-Annual
		Cleveland-Akron	2017	Month
	Pennsylvania (Western)	Pittsburg	1984-2017	1984-1997: Every other month 1998-2017: Annual
	West Virginia (Northern Panhandle)	No		
05-Richmond	Maryland	Baltimore-Columbia-Towson	1914-2022	1914-1940: Annual 1941-1947: Month 1948-1977: Quarter 1978-2022: Every other month
		Washington-Arlington-Alexandria	1914-2022	1914-1941: Annual 1942-1947: Month 1948-1977: Quarter 1978-2022: Every other month
		Philadelphia-Camden-Wilmington	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
	North Carolina	No		
	South Carolina	No		
	Virginia	Washington-Arlington-Alexandria	1914-2022	1914-1941: Annual 1942-1947: Month 1948-1977: Quarter 1978-2022: Every other month
06-Atlanta	Alabama	No		
	Florida	Miami-Fort Lauderdale-West Palm Beach	1977-2022	Every other month
		Tampa-St. Petersburg-Clearwater	2017-2022	Every other month
	Georgia	Atlanta-Sandy Springs-Roswell	1917-2022	1917-1934: Annual 1935-1977: Quarter 1978-1986: Every other month 1987-1997: Annual 1998-2022: Every other month
	Louisiana (Southern),	No		
	Mississippi (Southern)	No		
	Tennessee (Eastern Two-Thirds)	No		

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District	State coverage	Best Area Data (BLS)	Coverage	
07-Chicago	Illinois (Northern)	Chicago-Naperville-Elgin	1914-2022	1914-1934: Annual 1935-1940: Quarter 1941-2022: Month
		St. Louis	1917-2022	1917-1934: Annual 1935-1940: Quarter 1941-1947: Month 1948-1977: Quarter 1978-1997: Every other month 1998-2017: Annual 2018-2022: Quarter
	Indiana (Northern)	Chicago-Naperville-Elgin	1914-2022	1914-1934: Annual 1935-1940: Quarter 1941-2022: Month
	Iowa	Midwest urban	1966-2022	1966-1977: Quarter 1978-1986: Every other month 1987-2022: Month
	Michigan	Detroit-Warren-Dearborn	1914-2022	1914-1934: Annual 1935-1940: Quarter 1941-1986: Month 1987-2022: Every other month
	Wisconsin (Southern)	Milwaukee-Racine	2016-2017	Semi-Annual
		Minneapolis-St. Paul-Bloomington	1917-2022	1917-1934: Annual 1935-1940: Quarter 1941-1947: Month 1948-1986: Quarter 1987-2017: Annual 2018-2022: Every other month
		Chicago-Naperville-Elgin	1914-2022	1914-1934: Annual 1935-1940: Quarter 1941-2022: Month
08-St. Louis	Arkansas	No		
	Illinois (Southern)	No		
	Indiana (Southern)	No		
	Kentucky (Western)	Cincinnati-Hamilton	2016-2017	Semi-Annual
	Mississippi (Northern)	No		
	Missouri (Eastern)	St. Louis	1917-2022	1917-1934: Annual 1935-1940: Quarter 1941-1947: Month 1948-1977: Quarter 1978-1997: Every other month 1998-2017: Annual 2018-2022: Quarter
	Tennessee (Western One-Third)	No		
09-Minneapolis	Michigan (Upper Peninsula)	No		
	Minnesota	Minneapolis-St. Paul-Bloomington	1917-2022	1917-1934: Annual 1935-1940: Quarter 1941-1947: Month 1948-1986: Quarter 1987-2017: Annual 2018-2022: Every other month
	Montana	No		
	North Dakota; South Dakota	No		
	Wisconsin (Northern)	No		
10-Kansas City	Colorado	Denver-Aurora-Lakewood	1964-2022	1964-1977: Quarter 1978-1986: Every other month 1987-2017: Annual 2018-2022: Every other month
	Kansas	Kansas City	2014-2017	Semi-Annual
	Missouri (Western)	Kansas City	2014-2017	Semi-Annual
	Nebraska	No		
	New Mexico (Northern)	No		
	Oklahoma	No		
	Wyoming	No		

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District	State coverage	Best Area Data (BLS)	Coverage	
11-Dallas	Louisiana (Northern)	No		
	New Mexico (Southern)	No		
	Texas	Houston-The Woodlands-Sugar Land	1914-2022	1914-1940: Annual 1941-1952: Month 1953-1977: Quarter 1978-2022: Every other month
		Dallas-Fort Worth-Arlington	1963-2022	1963-1977: Quarter 1978-2022: Every other month
12-San Francisco	Alaska	Urban Alaska	1960-2022	1960-1968: Annual 1969-1977: Quarter 1978-1986: Every other month 1987-2017: Annual 2018-2021: Every other month
	Arizona	Phoenix-Mesa-Scottsdale	1914-2022	1914-1940: Annual 1941-1997: Month 1998-2022: Every other month
	California	Los Angeles-Long Beach-Anaheim	1914-2022	1914-1940: Annual 1941-2022: Month
		San Francisco-Oakland-Hayward	1914-2022	1914-1940: Annual 1941-1947: Month 1948-1977: Quarter 1978-1986: Every other month 1987-1997: Month 1998-2022: Every other month
		San Diego-Carlsbad	1965-2022	1965-1977: Quarter 1978-1986: Every other month 1987-2017: Annual 2018-2022: Every other month
		Riverside-San Bernardino-Ontario	2017-2022	Every other month
	Hawaii	Urban Hawaii	1963-2022	1963-1977: Quarter 1978-1986: Every other month 1987-2017: Annual 2018-2022: Every other month
	Oregon	Portland	2012-2017	Semi-Annual
	Washington	Seattle-Tacoma-Bellevue	1914-2022	1914-1934: Annual 1935-1940: Quarter 1941-1947: Month 1948-1977: Quarter 1978-1986: Every other month 1987-1997: Annual 1998-2022: Every other month
	Idaho; Nevada; Utah	No		

Table A2: State growth rates used to calculate district growth rates. Gray indicates a state that is used in two districts.

1	**Boston**	Connecticut	Maine	Massachusetts	New Hampshire	Rhode Island	Vermont			
2	**New York**	New York	Connecticut	New Jersey						
3	**Philadelphia**	Delaware	New Jersey	Pennsylvania						
4	**Cleveland**	Kentucky	Ohio	Pennsylvania	West Virginia					
5	**Richmond**	Maryland	North Carolina	South Carolina	Virginia	West Virginia				
6	**Atlanta**	Alabama	Florida	Georgia	Louisiana	Mississippi	Tennessee			
7	**Chicago**	Illinois	Indiana	Iowa	Michigan	Wisconsin				
8	**St Louis**	Arkansas	Illinois	Indiana	Kentucky	Missouri	Mississippi	Tennessee		
9	**Minneapolis**	Michigan	Minnesota	Montana	North Dakota	South Dakota	Wisconsin			
10	**Kansas**	Colorado	Kansas	Missouri	Nebraska	New Mexico	Oklahoma	Wyoming		
11	**Dallas**	Louisiana	New Mexico	Texas						
12	**San Francisco**	Alaska	Arizona	California	Hawaii	Idaho	Nevada	Oregon	Utah	Washington

A.3. Datasets related to the FOMC

A.3.1. FOMC events.

In our research that involves examining target rate changes, voting decisions, and transcripts, we focus on all FOMC meetings from January 1958 to December 2021 that:

(1) *Discussed and made decisions about target rates.* This includes recording the voting decisions of each voting member. Note that while unconventional monetary policy is important in certain periods in U.S. history (typically as part of crucial domestic or global crisis responses), the present research examines a story that is not specific to any given period, and therefore we use a standard, consistent measure of monetary policy decision outcome, the Federal funds rate ("FFR"). The other advantage is that the FFR also has a corresponding futures market, which allows us to examine investor perceptions in a dynamic way.

(2) *Released policy statements.* Note that releasing statements is an important part of central bank communications to the public and the investors; when there is no decision being made or votes being cast, no statement is released. An example is the 1/9/2008 conference call, during which no voting procedure happened or a decision was made.[26] In contrast, the FOMC released a statement on the 10/7/2008 conference call at 7:00 AM EDT on October 8, 2008,[27] in which it stated that "the Board of Governors unanimously approved a 50-basis-point decrease in the discount rate to 1-3/4 percent." The 10/7/2008 meeting's votes can be found in its statement (or later, in its meeting transcript, which has a five-year delay in publishing).[28] While the two examples above are conference calls, most of the FOMC events in our sample are scheduled meetings.

(3) *Generated transcripts or minutes.* Our research also examines the speech patterns of Reserve Bank presidents at FOMC meetings, which serves as more direct evidence. In addition, our research also examines whether the market understands the role of Reserve Banks at FOMC meetings, and therefore, public releases of these detailed record of FOMC meeting proceedings are important. Transcript is the most detailed record of all and is made available to the public, with a five-year delay. The first transcript record for a meeting in which a vote occurred is the 4/20/1976 meeting, according to the archive page, https://www.federalreserve.gov/monetarypolicy/fomc_historical_year.htm. As of August 2022, we are able to download and retrieve 357 FOMC transcripts, corresponding to meetings from 4/20/1976 to 12/14/2016.

Overall, we focus on 677 FOMC events that range from 1/7/1958 to 12/15/2021 and have FFR decisions, public statements/announcements, and recorded transcripts/minutes.

[26] https://www.federalreserve.gov/monetarypolicy/files/FOMC20080109confcall.pdf
[27] https://www.federalreserve.gov/newsevents/pressreleases/monetary20081008a.htm
[28] https://www.federalreserve.gov/monetarypolicy/files/FOMC20081007confcall.pdf

In terms of event formality, 661 are meetings and 16 are conference calls. Here are the 16 conference calls that satisfy our research objective:

Conference Calls in our analysis	Chairman
4/19/1968	William McChesney Martin Jr.
8/19/1968	Alfred Hayes
3/10/1978	Arthur F. Burns
5/5/1978	G. William Miller
3/7/1980	Paul A. Volcker
5/6/1980	Paul A. Volcker
11/26/1980	Paul A. Volcker
12/5/1980	Paul A. Volcker
12/12/1980	Paul A. Volcker
2/24/1981	Paul A. Volcker
5/6/1981	Paul A. Volcker
10/15/1998	Alan Greenspan
4/18/2001	Alan Greenspan
9/17/2001	Alan Greenspan
10/7/2008	Ben S. Bernanke

Therefore, most of the events we analyze are scheduled FOMC meetings. For simplicity, we refer to all of them as "FOMC meetings" in the paper.

A.3.2. FOMC dissenter data.

Source documents

To collect our dissenter data, we recover the voting results for each member – agree, dissent for a tighter monetary policy, dissent for an easier monetary policy, or dissent for other reasons – from various publicly available documents that describe the *proceedings* of the FOMC. There are typically 12 votes, but that number does vary over time, especially during turnovers and transitions (see Figure 2). We draw member-level voting results from multiple sources:

- Before 1967, we parse both the "**Record of Policy Actions**" and the "**Historical Minutes**."
- From 1967 to 1975, we parse both the "**Record of Policy Actions**" and the "**Minutes of Actions**." Before 1976, the writing of the minutes evolved a few times (see details in https://www.federalreserve.gov/monetarypolicy/fomc_historical.htm). This is fine for our purposes because all versions of the minutes show voting results.
- From 1976 to 2016, we parse both the "**Transcript**" and the "**Minutes**." Transcripts are the most detailed (verbatim records of the speech of each participant in the order of speaking), but they have a 5-year delay in their public releases; on the other hand, the minutes are high-level summaries of the FOMC's proceedings and have a timely release schedule. Both have voting results.
- From 2017-2021, there are no transcripts available because of the delay in release, so we parse only the "**Minutes**."

Examples

We provide three examples of data sources and collection from three representative periods – before 1967, 1967-1975, and 1976-2021. The output data structure is at the meeting-participant level; that is, for each meeting, what is the voting decision for each participant?

Example 1: January 7, 1958. Record of Policy Actions: https://www.federalreserve.gov/monetarypolicy/files/fomcropa19580107.pdf; Historical Minutes: https://www.federalreserve.gov/monetarypolicy/files/fomchistmin19580107.pdf

- Participant list:

> A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington on Tuesday, January 7, 1958, at 10:00 a.m.
>
> PRESENT: Mr. Martin, Chairman
> Mr. Hayes, Vice Chairman
> Mr. Allen
> Mr. Balderston
> Mr. Bryan
> Mr. Leedy
> Mr. Mills
> Mr. Robertson
> Mr. Shepardson
> Mr. Szymczak
> Mr. Williams

- Voting results and comments:

> Votes for this action: Messrs. Martin, Chairman, Hayes, Vice Chairman, Allen, Balderston, Bryan, Leedy, Mills, Robertson, Shepardson, Szymczak, and Williams. Votes against this action: none.

- Data collection: In this meeting, there are 11 voting participants (votes), including 5 district presidents and 6 governors from the Board. This meeting is recorded in our sample as follows:

Last Name	Chair	President	Governor	Tag	Dissenters_Tighter	Dissenters_Easier	Dissenters_Other
Martin	1	0	0	Governor	0	0	0
Hayes	0	1	0	NewYork	0	0	0
Allen	0	1	0	Chicago	0	0	0
Balderston	0	0	1	Governor	0	0	0
Bryan	0	1	0	Atlanta	0	0	0
Leedy	0	1	0	Kansas	0	0	0
Mills	0	0	1	Governor	0	0	0
Robertson	0	0	1	Governor	0	0	0
Shepardson	0	0	1	Governor	0	0	0
Szymczak	0	0	1	Governor	0	0	0
Williams	0	1	0	Philadelphia	0	0	0

Example 2: February 20, 1974. Record of Policy Actions: https://www.federalreserve.gov/monetarypolicy/files/fomcropa19740220.pdf; Historical Minutes: https://www.federalreserve.gov/monetarypolicy/files/fomcmoa19740220.pdf

- Participant list:

Meeting of Federal Open Market Committee

February 20, 1974

MINUTES OF ACTIONS

A meeting of the Federal Open Market Committee was held in the offices of the Board of Governors of the Federal Reserve System in Washington, D.C. on Wednesday, February 20, 1974, at 9:30 a.m.

PRESENT: Mr. Burns, Chairman
Mr. Hayes, Vice Chairman
Mr. Balles
Mr. Brimmer
Mr. Bucher
Mr. Daane
Mr. Francis
Mr. Holland
Mr. Mayo
Mr. Mitchell
Mr. Morris
Mr. Sheehan

- Voting results and comments:

2/20/74

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To implement this policy, while taking account of international and domestic financial market developments, the Committee seeks to achieve bank reserve and money market conditions consistent with moderate growth in monetary aggregates over the months ahead.

Votes for this action: Messrs. Burns, Hayes, Balles, Brimmer, Daane, Holland, Mayo, and Mitchell. Votes against this action: Messrs. Bucher, Francis, Morris, and Sheehan.

The members dissenting from this action did so for different reasons. Messrs. Bucher, Morris, and Sheehan expressed concern about current and prospective weakness in aggregate economic demands. In order to encourage further declines in short- and long-term interest rates, including mortgage rates, they favored somewhat higher ranges of tolerance for the monetary aggregates and a lower range for the Federal funds rate than the Committee had agreed would be consistent with the directive. Mr. Francis expressed the view that the over-all economic situation was stronger than suggested by the staff projections and that inflation remained the major long-term economic problem. He dissented because he thought the policy adopted by the Committee would permit the money stock to grow at a faster rate than was consistent with progress in dealing with inflation.

- Data collection: In this meeting, there are 12 voting participants (votes), including 5 district presidents and 7 governors from the Board. Notice that from the record, there are 4 dissenters; the comments above state clearly that Bucher, Morris, and Sheehan viewed the current aggregate demand as still quite weak and favored a more lax policy; on the other hand, Francis saw the economy as strong and favored a tighter policy. As a result, these four are dissenters in this meeting. This meeting is recorded in our sample as follows:

Last Name	Chair	President	Governor	Tag	Dissenters_Tighter	Dissenters_Easier	Dissenters_Other
Burns	1	0	0	Governor	0	0	0
Hayes	0	1	0	NewYork	0	0	0
Balles	0	1	0	SanFrancisco	0	0	0
Brimmer	0	0	1	Governor	0	0	0
Bucher	0	0	1	Governor	0	1	0
Daane	0	0	1	Governor	0	0	0
Francis	0	1	0	StLouis	1	0	0
Holland	0	0	1	Governor	0	0	0
Mayo	0	1	0	Chicago	0	0	0
Mitchell	0	0	1	Governor	0	0	0
Morris	0	1	0	Boston	0	1	0
Sheehan	0	0	1	Governor	0	1	0

Example 3: September 21, 2011. Transcript: https://www.federalreserve.gov/monetarypolicy/files/FOMC20110921meeting.pdf; Minutes: https://www.federalreserve.gov/monetarypolicy/fomcminutes20110921.htm

- Participant list:

September 20–21, 2011 1 of 290

Meeting of the Federal Open Market Committee on September 20–21, 2011

A joint meeting of the Federal Open Market Committee and the Board of Governors of the Federal Reserve System was held in the offices of the Board of Governors in Washington, D.C., starting on Tuesday, September 20, 2011, at 10:30 a.m., and continuing on Wednesday, September 21, 2011, at 9:00 a.m.

Ben Bernanke, Chairman
William C. Dudley, Vice Chairman
Elizabeth Duke
Charles L. Evans
Richard W. Fisher
Narayana Kocherlakota
Charles I. Plosser
Sarah Bloom Raskin
Daniel K. Tarullo
Janet L. Yellen

- Voting results and comments:

Voting for this action: Ben Bernanke, William C. Dudley, Elizabeth Duke, Charles L. Evans, Sarah Bloom Raskin, Daniel K. Tarullo, and Janet L. Yellen.

Voting against this action: Richard W. Fisher, Narayana Kocherlakota, and Charles I. Plosser.

Messrs. Fisher, Kocherlakota, and Plosser dissented because they did not support additional policy accommodation at this time. Mr. Fisher saw a maturity extension program as providing few, if any, benefits in support of job creation or economic growth, while it could potentially constrain or complicate the timely removal of policy accommodation. In his view, any reduction in long-term Treasury rates resulting from this policy action would likely lead to further hoarding by savers, with counterproductive results on business and consumer confidence and spending behaviors. He felt that policymakers should instead focus their attention on improving the monetary policy transmission mechanism, particularly with regard to the activity of community banks, which are vital to small business lending and job creation. Mr. Kocherlakota's perspective on the policy decision was again shaped by his view that in November 2010, the Committee had chosen a level of accommodation that was well calibrated for the condition of the economy. Since November, inflation, and the one-year-ahead forecast for inflation, had risen, while unemployment, and the one-year-ahead forecast for unemployment, had fallen. He did not believe that providing more monetary accommodation was the appropriate response to those changes in the economy, given the current policy framework. Mr. Plosser felt that a maturity extension program would do little to improve near-term growth or employment, in light of the ongoing structural adjustments and fiscal challenges both in the United States and abroad. Moreover, in his view, with inflation continuing to run above earlier forecasts, such a program could risk adding unwanted inflationary pressures and complicate the eventual exit from the period of extraordinarily accommodative monetary policy.

- Data collection: In this meeting, there are 10 voting participants (votes), including 5 district presidents and 5 governors from the Board. Notice that according to the record, there are 3 dissenters, and they all favored a tighter policy. This meeting is recorded in our sample as follows:

Last Name	Chair	President	Governor	Tag	Dissenters_Tighter	Dissenters_Easier	Dissenters_Other
Bernanke	1	0	0	Governor	0	0	0
Dudley	0	1	0	NewYork	0	0	0
Duke	0	0	1	Governor	0	0	0
Evans	0	1	0	Chicago	0	0	0
Fisher	0	1	0	Dallas	1	0	0
Kocherlakota	0	1	0	Minneapolis	1	0	0
Plosser	0	1	0	Philadelphia	1	0	0
Raskin	0	0	1	Governor	0	0	0
Tarullo	0	0	1	Governor	0	0	0
Yellen	0	0	1	Governor	0	0	0

Summary of data collection

The data collection effort for the voting results of these 677 FOMC meetings (1958-2021) has three steps. First, we use Python to parse down the full participant list of each meeting as listed on the first or second page of these records. One major challenge during this process is that the formats of these documents have changed quite a few times over the past 64 years; our research team also manually checks the scraped results for accuracy. Another challenge is that in the early years, the minutes or transcripts only mention last names and titles, and their district or board affiliation is not mentioned at all, which can be observed in the three examples above. However, common last names such as "Johnson" or "Meyer" could represent different people at different meetings or from different districts.[29] The other challenge is that the same person could also serve both as a governor and a district president during their central banking career time. For instance, Janet L. Yellen was a Governor on the Board from August 12, 1994 to February 17, 1997, the President of the Federal Reserve Bank of San Francisco from June 14, 2004 to October 4, 2010, the Vice Chair of the Board from October 4, 2010 to February 3, 2014, and the Chair of the Board from February 3, 2014 to February 3, 2018.

To circumvent these challenges (which could potentially lead to misalignment between district representation and participant's name), we build a database of all current and past governors and district presidents and their in-office time periods since 1914. This way, we are able to determine precisely who was present at each meeting and what roles they held. This database primarily parses data from this website https://www.federalreserve.gov/aboutthefed/bios/board/boardmembership.htm for governor information, and from Reserve Bank websites that provide a detailed list of their past presidents.[30]

In the second step, we identify the voting results. It is easy to identify dissenter(s), as public statements, minutes, transcripts, and other meeting records all summarize this information in one or two sentences. However, we are also interested in whether a dissenter was in favor of tighter or easier policy. In this step, we build on the existing effort by Thornton and Wheelock (2014),[31] where they provide *last names* of the voting members who dissented for tighter policy, easier policy, or other reasons in FOMC scheduled meetings from 1936 to present. We make several important necessary additions to their dataset, and we plan to release our dataset for other researchers to use. First, our research team manually checks this existing dataset and is able to validate most documented dissenter names. Then, we record voting results for the conference calls that we also examine in this paper. In addition, our dataset also expands and provides information on who *agreed* with the decision, so that we have a full record of voting decisions by every single member. As a result, our dataset is at the meeting-member level, which makes it versatile for other research questions.

A.3.3. FOMC transcript data.

As mentioned before, our dataset ranges from 1958 to 2021 and includes a total of 677 meetings or conference calls. To conduct the textual analysis discussed in Section 5, we need to obtain transcripts that record all words spoken by meeting participants

[29] Starting with the January 26-27, 2010 meeting, transcripts and minutes dropped the titles and included full names.

[30] All Reserve Banks have pages on their websites similar to this one from Boston: https://www.bostonfed.org/about-the-boston-fed/our-history/past-presidents.aspx.

[31] Their dataset can be found here: https://www.stlouisfed.org/fomcspeak/history-fomc-dissents.

(voting and non-voting).[32] Transcripts have a 5-year delay in public releases and are only publicly available from 1976. Therefore, the longest transcript sample one can obtain is from 4/20/1976 to 12/14/2016 (which is the last transcript available at the time of our first draft, September 2022). Minutes do not provide the information that we extract from the transcripts (i.e., the exact words spoken by district presidents and governors). Therefore, we analyze a total of 357 transcripts from 4/20/1976 to 12/14/2016.

Transcripts of FOMC meetings can have 300 or more pages; those of FOMC conference calls are around 5 to 30 pages. Transcripts are organized in the order that words were spoken by people in the room, including governors and district presidents who have votes, district presidents who do not have votes, Fed economists, and other accompanying staff.

A.3.4. Target Federal funds rate data.

We use standard data choices to obtain the target Federal funds rate (FFR), given the existing literature. Romer and Romer (2004) collect and provide Federal funds target rates (or what the paper calls the "intended rate") from January 14, 1969 to December 17, 1996. To be specific, the original dataset provides "change in the intended funds rate decided at the meeting" and "level of the intended funds rate before the meeting," which makes the sum of these two numbers the new target rate at the end of the meeting.

From the February 5, 1997 meeting to the June 19, 2019 meeting, we use Kenneth N. Kuttner's target FFR collection.[33] Kuttner's dataset starts in 1989. We use the Romer-Romer dataset as long as possible (until 1996), and then continue with Kuttner's dataset.

Finally, starting in 2008, the target rate becomes a range; given that most studies are interested in the change in the target FFR, we follow Kuttner's choice of using the lower range value to determine the changes in FFR for meetings after June 19, 2019. This allows us to extend our sample until the last meeting in 2021.

The unit of change in FFR is percentage points, as is standard practice in the literature.

[32] According to the Fed website, "Beginning with the 1994 meetings, the FOMC Secretariat has produced the transcripts shortly after each meeting from an audio recording of the proceedings, lightly editing the speakers' original words, where necessary, to facilitate the reader's understanding. Meeting participants are given an opportunity within the subsequent several weeks to review the transcript for accuracy. For the meetings before 1994, the transcripts were produced from the original, raw transcripts in the FOMC Secretariat's files. These records have also been lightly edited by the Secretariat to facilitate the reader's understanding... In transcripts from all years, a very small amount of information received on a confidential basis from, or about, foreign officials, businesses, and persons that are identified or identifiable was subject to deletion. All deleted passages, indicated by gaps in the text, are exempt from disclosure under applicable provisions of the Freedom of Information Act."

[33] The link to the dataset is in `https://econ.williams.edu/faculty-pages/research/`, and the exact dataset is in `https://docs.google.com/spreadsheets/d/1Up04KzMYug9zyKWYFdr0gQD7S6n_Q7d7/edit#gid=696203667`. At the time of writing, the last available update is the June 19, 2019 meeting.

A.4. Futures Data

To capture investors' expectations about policy actions (the Federal funds rate), we follow Kuttner (2001) and Bernanke and Kuttner (2005) (as well as many papers that follow) and use the price of Federal funds futures contracts to infer market expectations of the effective Federal funds rate, averaged over the settlement month. The contracts are officially referred to as "30-Day Federal Funds Futures," and are traded on the Chicago Board of Trade (CBOT), a part of the Chicago Mercantile Exchange (CME) Group. There are three empirical details to note.

Sample period. These contracts start trading in 1989, but we follow the literature and focus on the period after 1994. As precautionarily mentioned in existing monetary economics literature (e.g., Rudebusch (1995), Bernanke and Kuttner (2005), and recently Cieslak and Vissing-Jorgensen (2021)), before 1994, market participants generally became aware of policy actions a day or two after the FOMC's decision, when it was implemented by the Open Market Operations Desk. As a result, our analysis in Section 4.3 uses a sample period starting in July 1994.

Contract terms. CME's Federal Funds Futures are monthly contracts, extending 60 months out on the yield curve. That is, on August 1, 2022, a series of contracts with different settlement months were released to be settled at the end of August, the end of September, the end of October, etc. (see e.g. `https://www.cmegroup.com/markets/interest-rates/stirs/30-day-federal-fund.quotes.html`). These are active contracts with potential trading activities and price fluctuations. Importantly, at the end of the contract term, the value of a Federal funds futures contract is calculated using the arithmetic average of the daily effective Federal funds rates (FFR) during the contract's terminal month, and is reported by the Federal Reserve Bank of New York. If the effective FFR during the terminal month is 2.5%, then the settlement price of a Federal funds futures contract expiring that month would be 100-2.5 = 97.5. Intuitively, if one believes that in the future the target rate will increase, then one should choose to sell the Federal funds future contract (expecting that its price will decrease in the future).

Since the Federal Open Market Committee (FOMC) sets the Federal funds target rate and most FOMC meetings can *but do not always* occur exactly on Day 1 of a new month, the first Federal funds futures contract to be fully affected by an FOMC decision should be the next contract term, not the contract that expires during the month when the FOMC meeting occurs. As a result, to capture as much of the market's expectations about future Federal funds rates as possible, the literature typically focuses on terms longer than 1 (current) month. In a paper that represents the state-of-the-art choice, Jarociński and Karadi (2020) use primarily the 3-month contract term, and use two, three, and four quarters ahead for robustness, for the reasons mentioned above (or see their discussion on Page 6 of their published version). Figure A1 shows the day gaps between two consecutive meetings within a year in our sample from 1958 to 2021. Since 1994, the gaps seem to center around 45 days, but also exhibit a wide range from 35 to

60 days. This makes 1, 2, and 3 months useful terms to look at, rather than focusing on any one given term.

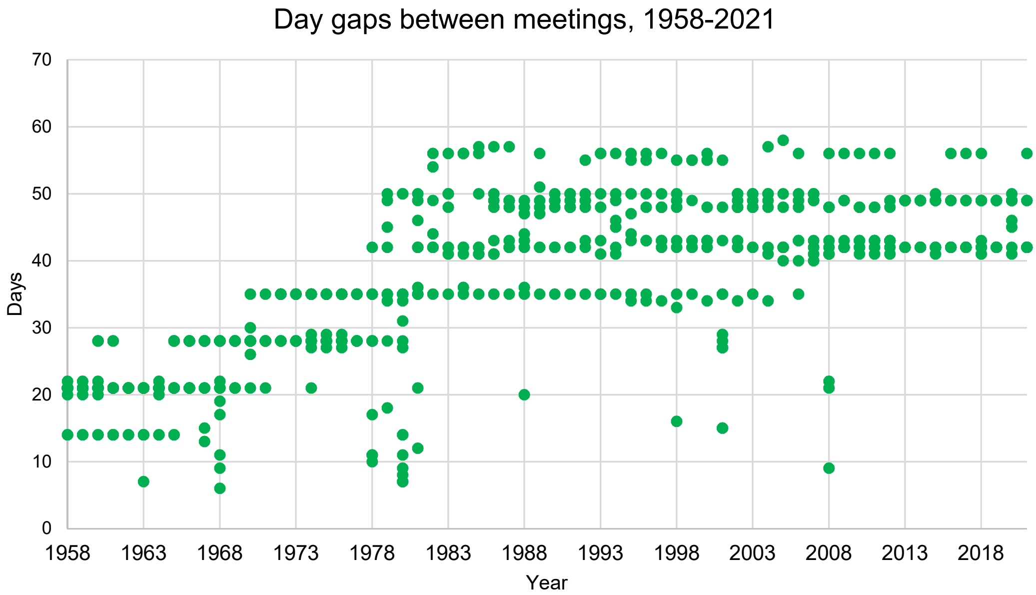

Figure A1: Number of days between two meetings. There are a few dots for each year; some years appear to have fewer dots due to overlaps.

Moreover, in terms of our research question, we are also interested in long-term Federal funds futures. The voting rotation changes at a low (yearly) frequency. Under our hypothesis that the macro conditions in districts with voting rights in an FOMC meeting might be over-weighted, investors could also believe that the voting district presidents could hold persistent views while in the voting chair. Therefore, from this perspective, we have no strong reasons to focus on one particular term. As a result, given that our paper does not have a high-frequency focus, we consider the average implied rate from Federal funds futures contracts across various terms as our main variable in Section 4.3; the average implied rate at the end of a meeting m is denoted as f_m, and its between-meeting first difference is denoted as Δf_m in the main paper (source: Refinitiv DataStream's composite series "CBOT-30 Day Federal Funds Composite Continuous Average").

B. Supplementary Tables and Figures

Table B1: Predicting changes in FFR using a general specification of the Taylor rule. This table complements Table 6 and replicates the Taylor rule using Greenbook variables, as in Cieslak and Vissing-Jorgensen (2021). Given that Greenbooks are released to the public with a 5-year delay, our sample period for this replication ends in 2016. $E_m(gGDP_{q0})$ is the forecast of real GDP growth (current quarter, q0). $E_m(Infl_{q1})$ ($E_m(UR_{q1})$) denotes GDP deflator inflation (unemployment rate), one quarter ahead (q1). Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m			
Sample period:		1969-2016			1994-2016	
	(1)	(2)	(3)	(4)	(5)	(6)
FFR_{m-1}	-0.0452***	0.1606	0.1444	-0.0233***	0.2295*	0.2293*
	(0.017)	(0.117)	(0.118)	(0.006)	(0.136)	(0.137)
FFR_{m-2}		-0.1858	-0.1884		0.0371	0.0359
		(0.186)	(0.184)		(0.221)	(0.223)
FFR_{m-3}		-0.0251	-0.0134		-0.2877***	-0.2920***
		(0.119)	(0.118)		(0.105)	(0.106)
$E_m(gGDP_{q0})$	0.0605***	0.0422**	0.0400**	0.0793***	0.0365**	0.0347**
	(0.014)	(0.017)	(0.016)	(0.016)	(0.017)	(0.017)
$E_m(Infl_{q1})$	0.0818***	0.0800***	0.0958***	0.0813***	0.0562**	0.0602***
	(0.024)	(0.023)	(0.027)	(0.024)	(0.022)	(0.022)
$E_m(UR_{q1})$			-0.0482**			-0.0108*
			(0.024)			(0.006)
Constant	-0.2029***	-0.1208*	0.1712	-0.2678***	-0.1311**	-0.0539
	(0.061)	(0.066)	(0.177)	(0.059)	(0.059)	(0.070)
N	447	445	445	189	187	187
R^2	0.098	0.14	0.15	0.39	0.53	0.54

Table B2: Predicting changes in FFR (including Greenbook's unemployment rate forecast).

This table complements Table 6 by including the Greenbook's unemployment rate forecast. Given that Greenbooks are released to the public with a 5-year delay, our sample period for this replication ends in 2016. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m	
	1969-2016	1994-2016
	(1)	(2)
$Infl^{Vote}_{m,t-1}$	0.3615*	0.1652**
	(0.189)	(0.066)
$rgPI^{Vote}_{m,t-1}$	0.0160	-0.0256
	(0.083)	(0.031)
$Infl^{US}_{m,t-1}$	-0.3613	-0.0823
	(0.228)	(0.078)
$rgPI^{US}_{m,t-1}$	0.0534	0.0957**
	(0.103)	(0.038)
FFR_{m-1}	0.1390	0.2146*
	(0.118)	(0.117)
FFR_{m-2}	-0.1829	0.0592
	(0.185)	(0.186)
FFR_{m-3}	-0.0168	-0.3108***
	(0.121)	(0.090)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$	-0.3284**	-0.2537***
	(0.147)	(0.090)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$	0.2927*	0.0526
	(0.153)	(0.068)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$	-0.0691	-0.0215
	(0.058)	(0.025)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$	-0.0104	-0.0361
	(0.062)	(0.026)
I^{ZLB}_m	0.0598	0.0321
	(0.111)	(0.038)
$E_m(gGDP_{q0})$	0.0291	0.0235
	(0.018)	(0.017)
$E_m(Infl_{q1})$	0.1021***	0.0702***
	(0.029)	(0.021)
$E_m(UR_{q1})$	-0.0504*	-0.0100
	(0.027)	(0.008)
Constant	0.1630	-0.0655
	(0.166)	(0.072)
N	445	187
R^2	0.16	0.62

Table B3: Predicting changes in FFR, 1994-2021.

This table complements Table 6, using the sample period that is consistent with the Federal funds futures regressions in Table 7 (1994-2021). See other table details in Table 6. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.1207**	0.1404**	0.1601**	0.1661**
		(0.056)	(0.064)	(0.069)	(0.066)
$Infl^{NoVote}_{m,t-1}$		0.0170			
		(0.064)			
$rgPI^{Vote}_{m,t-1}$		-0.0105	0.0094*	0.0012	-0.0266
		(0.024)	(0.005)	(0.031)	(0.031)
$rgPI^{NoVote}_{m,t-1}$		0.0204			
		(0.023)			
$Infl^{US}_{m,t-1}$	0.1245			-0.0544	-0.0815
	(0.083)			(0.081)	(0.078)
$rgPI^{US}_{m,t-1}$	0.0116**			0.0837**	0.0964**
	(0.005)			(0.040)	(0.038)
FFR_{m-1}	-0.0045	-0.0047	-0.0047	0.3070***	0.2148*
	(0.006)	(0.006)	(0.006)	(0.098)	(0.117)
FFR_{m-2}				-0.0087	0.0608
				(0.173)	(0.185)
FFR_{m-3}				-0.3211***	-0.3101***
				(0.093)	(0.089)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.2838***	-0.2532***
				(0.094)	(0.089)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0346	0.0340
				(0.073)	(0.064)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.0647*	-0.0173
				(0.036)	(0.024)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				-0.0173	-0.0372
				(0.038)	(0.026)
I^{ZLB}_m				0.0400	0.0144
				(0.035)	(0.032)
$E_m(gGDP_{q0})$					0.0250
					(0.017)
$E_m(Infl_{q1})$					0.0669***
					(0.021)
Constant	-0.0331	-0.0310	-0.0311	-0.0021	-0.1245**
	(0.023)	(0.023)	(0.020)	(0.027)	(0.057)
N	229	229	229	227	187
R^2	0.036	0.050	0.045	0.50	0.61
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.237			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5069			

Table B4: Predicting changes in FFR using MSA population-weighted inflation rates for districts with multiple MSA-level CPI data series.

This table complements Table 6, using MSA population-weighted inflation rates for districts with multiple MSA-level CPI data series. As motivated in Appendix A, for five districts (New York, Richmond, Chicago, Dallas, San Francisco), there are more than one MSA-level CPI data series within the same district. In this robustness test, we obtain all these additional MSA-level CPI data and the corresponding population data (source: Census's population survey; https://www2.census.gov/programs-surveys/popest/tables/). We calculate MSA-level inflation rates and then the MSA population-weighted average inflation rates for each of these five districts, as an alternative inflation measure. Prior to 1990, MSA-level population is not available from Census. Instead, county-level population data are available. We therefore construct MSA-level population using the provided county-level data. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.3217***	0.2858***	0.4689**	0.4116**
		(0.109)	(0.097)	(0.183)	(0.188)
$Infl^{NoVote}_{m,t-1}$		-0.0633			
		(0.111)			
$rgPI^{Vote}_{m,t-1}$		0.0462	0.0404**	0.0641	0.0374
		(0.040)	(0.018)	(0.082)	(0.084)
$rgPI^{NoVote}_{m,t-1}$		-0.0056			
		(0.043)			
$Infl^{US}_{m,t-1}$	0.2000*			-0.1616	-0.3415
	(0.121)			(0.229)	(0.224)
$rgPI^{US}_{m,t-1}$	0.0371*			0.0425	0.0387
	(0.019)			(0.101)	(0.103)
FFR_{m-1}	-0.0203	-0.0230	-0.0243*	0.1963*	0.1488
	(0.015)	(0.014)	(0.014)	(0.117)	(0.116)
FFR_{m-2}				-0.1826	-0.1747
				(0.191)	(0.186)
FFR_{m-3}				-0.0497	-0.0351
				(0.118)	(0.120)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.5142***	-0.3651**
				(0.136)	(0.144)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.1382	0.1847
				(0.147)	(0.143)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.1171**	-0.0638
				(0.059)	(0.055)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0107	-0.0074
				(0.065)	(0.060)
I^{ZLB}_m				-0.0084	-0.0389
				(0.081)	(0.100)
$E_m(gGDP_{q0})$					0.0291*
					(0.017)
$E_m(Infl_{q1})$					0.0823***
					(0.024)
Constant	0.0011	-0.0094	-0.0114	0.0249	-0.1006
	(0.054)	(0.055)	(0.055)	(0.082)	(0.106)
N	487	487	487	485	445
R^2	0.019	0.031	0.030	0.12	0.16
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.038			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5206			

Table B5: Predicting changes in FFR using an alternative inflation data choice for the San Francisco District.

This table complements Table 6, using an alternative inflation data choice for the San Francisco District. As motivated in Appendix A, we use CPI data from “San Francisco-Oakland-Hayward” to obtain our primary inflation rate for the San Francisco District, given that it is where the Head Office resides and has CPI data starting from 1914. For this FFR regression, we use CPI data from “Los Angeles-Long Beach-Anaheim” to obtain the next best alternative inflation rate for the San Francisco District, given that this MSA has the largest population among all other MSAs in this district (and in fact the second largest in the United States according to Census data). The two inflation rates (San Francisco-Oakland-Hayward, Los Angeles-Long Beach-Anaheim) are significantly correlated at 57.4% during 1969-2021. See other table details in Table 6. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.3332***	0.2925***	0.4950***	0.4324**
		(0.108)	(0.096)	(0.191)	(0.201)
$Infl^{NoVote}_{m,t-1}$		-0.0744			
		(0.112)			
$rgPI^{Vote}_{m,t-1}$		0.0454	0.0397**	0.0618	0.0352
		(0.039)	(0.018)	(0.083)	(0.084)
$rgPI^{NoVote}_{m,t-1}$		-0.0058			
		(0.043)			
$Infl^{US}_{m,t-1}$	0.2000*			-0.1891	-0.3642
	(0.121)			(0.236)	(0.238)
$rgPI^{US}_{m,t-1}$	0.0371*			0.0398	0.0385
	(0.019)			(0.101)	(0.103)
FFR_{m-1}	-0.0203	-0.0232	-0.0248*	0.1975*	0.1509
	(0.015)	(0.014)	(0.014)	(0.117)	(0.117)
FFR_{m-2}				-0.1817	-0.1739
				(0.191)	(0.186)
FFR_{m-3}				-0.0520	-0.0385
				(0.118)	(0.121)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.5219***	-0.3884***
				(0.139)	(0.142)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.1483	0.2191
				(0.149)	(0.151)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.1122*	-0.0655
				(0.059)	(0.055)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0107	-0.0024
				(0.065)	(0.061)
I^{ZLB}_m				-0.0236	-0.0562
				(0.080)	(0.099)
$E_m(gGDP_{q0})$					0.0277
					(0.018)
$E_m(Infl_{q1})$					0.0826***
					(0.024)
Constant	0.0011	-0.0014	-0.0060	0.0371	-0.0849
	(0.054)	(0.055)	(0.054)	(0.081)	(0.105)
N	487	487	487	485	445
R^2	0.019	0.033	0.031	0.12	0.16
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.0281			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5240			

Table B6: Predicting changes in FFR using an alternative inflation data choice for the Dallas District.

This table complements Table 6, using an alternative inflation data choice for the Dallas District. As motivated in Appendix A, we use CPI data from "Houston-The Woodlands-Sugar Land" to obtain our primary inflation rate for the Dallas District, given that the next best data choice, "Dallas-Fort Worth-Arlington," does not start until 1963. For this particular FFR regression, which starts from 1969, we therefore are able to use CPI data from Dallas-Fort Worth-Arlington to obtain the alternative inflation rate for the Dallas District. The two inflation rates (Houston-The Woodlands-Sugar Land, and Dallas-Fort Worth-Arlington) are significantly correlated at 60.9% during 1969-2021. See other table details in Table 6. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.3190***	0.2866***	0.4445**	0.4005**
		(0.101)	(0.093)	(0.178)	(0.181)
$Infl^{NoVote}_{m,t-1}$		-0.0607			
		(0.109)			
$rgPI^{Vote}_{m,t-1}$		0.0431	0.0391**	0.0581	0.0314
		(0.039)	(0.018)	(0.082)	(0.084)
$rgPI^{NoVote}_{m,t-1}$		-0.0041			
		(0.043)			
$Infl^{US}_{m,t-1}$	0.2000*			-0.1461	-0.3406
	(0.121)			(0.233)	(0.224)
$rgPI^{US}_{m,t-1}$	0.0371*			0.0431	0.0416
	(0.019)			(0.101)	(0.103)
FFR_{m-1}	-0.0203	-0.0233	-0.0246*	0.1978*	0.1499
	(0.015)	(0.015)	(0.014)	(0.117)	(0.116)
FFR_{m-2}				-0.1849	-0.1765
				(0.191)	(0.186)
FFR_{m-3}				-0.0487	-0.0353
				(0.118)	(0.120)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.4908***	-0.3585***
				(0.128)	(0.135)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.1184	0.1935
				(0.144)	(0.141)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.1087*	-0.0596
				(0.059)	(0.054)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0079	-0.0083
				(0.065)	(0.060)
I^{ZLB}_m				-0.0237	-0.0558
				(0.080)	(0.098)
$E_m(gGDP_{q0})$					0.0283
					(0.017)
$E_m(Infl_{q1})$					0.0840***
					(0.024)
Constant	0.0011	-0.0004	-0.0044	0.0375	-0.0868
	(0.054)	(0.055)	(0.054)	(0.081)	(0.105)
N	487	487	487	485	445
R^2	0.019	0.031	0.031	0.12	0.16
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.0301			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.5538			

Table B7: Predicting changes in FFR using an alternative method to obtain district-level real PI growth.

This table complements Table 6, using an alternative method to obtain district-level real PI growth – using non-overlapping districts only. As mentioned in Appendix A.2, there are states that belong to multiple (2) districts. In the main paper, we take the average of all states that are covered in a district; in this robustness test, we take the average of all states that uniquely belong to a district. See other table details in Table 6. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			ΔFFR_m		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.3119***	0.2891***	0.4590**	0.3876**
		(0.101)	(0.094)	(0.181)	(0.189)
$Infl^{NoVote}_{m,t-1}$		-0.0537			
		(0.109)			
$rgPI^{Vote}_{m,t-1}$		0.0083	0.0361**	0.0068	-0.0100
		(0.031)	(0.018)	(0.067)	(0.068)
$rgPI^{NoVote}_{m,t-1}$		0.0302			
		(0.033)			
$Infl^{US}_{m,t-1}$	0.1993*			-0.1538	-0.3300
	(0.121)			(0.235)	(0.232)
$rgPI^{US}_{m,t-1}$	0.0389*			0.0834	0.0816
	(0.020)			(0.080)	(0.081)
FFR_{m-1}	-0.0203	-0.0235	-0.0247*	0.2002*	0.1518
	(0.015)	(0.014)	(0.014)	(0.117)	(0.117)
FFR_{m-2}				-0.1887	-0.1798
				(0.191)	(0.186)
FFR_{m-3}				-0.0484	-0.0353
				(0.118)	(0.120)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.5055***	-0.3424**
				(0.132)	(0.140)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.1228	0.1810
				(0.148)	(0.148)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.0657	-0.0243
				(0.050)	(0.047)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				-0.0243	-0.0447
				(0.050)	(0.047)
I^{ZLB}_m				-0.0302	-0.0598
				(0.083)	(0.101)
$E_m(gGDP_{q0})$					0.0267
					(0.017)
$E_m(Infl_{q1})$					0.0854***
					(0.025)
Constant	-0.0013	-0.0005	-0.0040	0.0458	-0.0804
	(0.055)	(0.055)	(0.055)	(0.084)	(0.106)
N	487	487	487	485	445
R^2	0.020	0.031	0.029	0.12	0.16
***p*-value, $Infl^{Vote}$-$Infl^{NoVote}$**		0.0369			
***p*-value, $rgPI^{Vote}$-$rgPI^{NoVote}$**		0.7163			

Table B8: Predicting changes in FFR (extensive margin test).

This table complements Table 6, using a categorical variable of changes in FFR as the dependent variable. $D_{\Delta FFR_m}$ is +1 if $\Delta FFR_m > 0$; 0 if $\Delta FFR_m = 0$; -1 if $\Delta FFR_m < 0$. See other table details in Table 6. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			$D_{\Delta FFR_m}\{-1 :< 0, 0 := 0, +1 :> 0\}$		
	(1)	(2)	(3)	(4)	(5)
$Infl^{Vote}_{m,t-1}$		0.5239***	0.4913***	0.7248***	0.5676***
		(0.120)	(0.106)	(0.208)	(0.205)
$Infl^{NoVote}_{m,t-1}$		-0.0626			
		(0.117)			
$rgPI^{Vote}_{m,t-1}$		0.0456	0.0509**	0.0551	0.0266
		(0.048)	(0.021)	(0.089)	(0.086)
$rgPI^{NoVote}_{m,t-1}$		0.0060			
		(0.046)			
$Infl^{US}_{m,t-1}$	0.3685***			-0.1774	-0.2859
	(0.126)			(0.245)	(0.234)
$rgPI^{US}_{m,t-1}$	0.0481**			0.0711	-0.0034
	(0.021)			(0.093)	(0.090)
FFR_{m-1}	-0.0264***	-0.0312***	-0.0325***	0.2168***	0.1342*
	(0.010)	(0.010)	(0.009)	(0.076)	(0.069)
FFR_{m-2}				-0.0725	-0.0656
				(0.104)	(0.090)
FFR_{m-3}				-0.1975***	-0.1344**
				(0.063)	(0.058)
$Infl^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.8456***	-0.6814***
				(0.170)	(0.206)
$Infl^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.1709	0.1592
				(0.163)	(0.188)
$rgPI^{Vote}_{m,t-1} * I^{ZLB}_m$				-0.1270*	-0.0479
				(0.066)	(0.069)
$rgPI^{NoVote}_{m,t-1} * I^{ZLB}_m$				0.0021	0.0357
				(0.062)	(0.060)
I^{ZLB}_m				-0.0389	-0.0047
				(0.075)	(0.085)
$E_m(gGDP_{q0})$					0.0801***
					(0.016)
$E_m(Infl_{q1})$					0.0862***
					(0.025)
Constant	0.0043	0.0017	-0.0025	0.0791	-0.2128**
	(0.047)	(0.048)	(0.046)	(0.073)	(0.085)
N	487	487	487	485	445
R^2	0.029	0.049	0.048	0.18	0.26
p-value, $Infl^{Vote}$-$Infl^{NoVote}$		0.0041			
p-value, $rgPI^{Vote}$-$rgPI^{NoVote}$		0.6630			