When Do FOMC Voting Rights Affect Monetary Policy?*

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Abstract

Using 472 FOMC meetings (1969–2019) and the exogenous rotation of voting rights among Reserve Bank presidents, we identify meetings where local economic conditions in voting districts significantly affect the Federal funds target rate (FFR), while those in non-voting districts show no effect. This voting-group effect persists after controlling for national conditions and Greenbook forecasts, implying that actual FFR decisions plausibly deviated from what average information and expectations would have suggested. Distortions are sizable, persistent, and priced into futures and Treasury markets prior to FOMC meetings. We demonstrate these findings using both components of the Fed's dual mandate: inflation and unemployment rates.

JEL Classification: E50, E58, D70, G10

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1. Introduction

The Federal Reserve System (the Fed) is responsible for setting monetary policy in the United States, and the Federal Open Market Committee (FOMC) is the monetary policymaking 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 the FFR impacts tens of trillions of dollars, the importance of FOMC decisions to the U.S. and world economies cannot be overstated.

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] According to Yellen, the goal is to find a common ground among all meeting participants—the governors and the twelve presidents—and identify a policy response that is in the best interests of the nation. Such a 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 common ground between *voting* members of the FOMC—governors and presidents with voting rights. In this scenario, the FOMC adopts the policy that receives the broadest support from the voting members; the adopted policy is likely to under-weight the interests of non-voting districts.

FOMC meeting participants indeed pay more attention to voting districts. According to FOMC transcripts, voting districts are 20% more likely to be mentioned by governors during FOMC meetings than are non-voting districts. Governors' attitudes towards voting presidents are also more positive than their attitudes towards non-voting presidents.

When do we expect economic conditions in voting presidents' districts to have an effect on FFR decisions? First, the FFR must be a relevant policy tool. In our setting, this means that the FFR needs to be above the zero lower bound (ZLB) because when the FFR is at the ZLB the FOMC is focused on quantitative monetary tools. Second, voting bank presidents are likely to have an effect on FOMC decisions when they do not dissent. That is, when there is a consensus about the FFR, it is likely that the FFR decision is the desired response (from the voting bank presidents' points of view) to

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

local economic conditions (e.g., Meade and Sheets, 2005; Bobrov, Kamdar, and Ulate, forthcoming). Finally, economic conditions in voting presidents' districts can affect the FFR only when there is sufficient dispersion in economic conditions across districts. If economic conditions across districts are too similar, the assignment of voting rights at the FOMC is less important. Using these three criteria, we assign FOMC meetings to the "effective" subsamples when we expect local economic conditions to affect the FFR and the remaining FOMC meetings to the "placebo" subsamples. We identify 130 (111) meetings in the inflation (unemployment rate) effective subsample.

Our main specification is a state-of-the-art Taylor rule model after Coibion and Gorodnichenko (2012), augmented with the average inflation and unemployment rate (UR) in voting and non-voting districts. We show that, in the effective subsamples, the inflation and unemployment rates in Reserve Bank presidents' voting districts significantly influence FOMC meeting outcomes, whereas those in non-voting districts have no significant effect. In particular, when there is a substantial dispersion in inflation across districts, a one standard deviation (SD) increase in voting districts' inflation rates predicts around a 0.29 SD or 13.7 basis point increase in the next FFR. In the same specification, the coefficients for inflation in non-voting districts are indistinguishable from zero. We conduct similar analyses using unemployment rates. A one SD increase in the voting district average unemployment rate in the prior month predicts a 0.54 standard deviation (or 48.0 basis point) decrease in the subsequent federal funds rate (FFR).

This result survives a series of robustness tests. For instance, we simulate 5,000 random voting paths and re-estimate the specification. Our results indicate an extremely low probability (around 2%–5%) that our findings based on the actual voting schedule in the effective subsample are due to randomness or noise, even across various alternative specifications. It should be noted that the rotating nature of Reserve Bank presidents' voting rights was determined in 1942 and deviations have been rare, implying that the allocation of voting rights is exogenous to the economic conditions in Reserve Bank presidents' districts.[2] Moreover, measurement errors in local economic conditions are not likely to explain our findings, as they would need to be systematically correlated with the exogenous voting rotation. We find no significant effects of voting-district economic conditions in the placebo subsamples.

Next, we follow Gürkaynak, Sack, and Swanson (2007) and use Federal funds futures data to study how capital market investors perceive the voting rotation. We

[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

find that inflation in voting districts has robust and significant effects on changes in average FF futures rates from the end of the previous meeting to the end of the current meeting. This finding indicates that market participants likely understand and price in the effect of local inflation on FOMC decisions. To explicitly test this, we decompose the changes in the federal funds futures rates (FFF) into two components: changes in the FFF from the day after the previous meeting to the day before the current meeting, and changes from the day before to the last day of the current meeting. We find that most effects are already in place *before* the meeting. Due to Federal funds futures data coverage, we cannot perform a similar exercise for UR. We also test whether inflation and unemployment rates in voting districts affect short- and long-term Treasury yields. We find that inflation in voting districts has a positive effect on changes in Treasury yields at shorter maturities, starting to appear even during the week prior to the meeting. The effect is insignificant for longer maturity bonds. Inflation in non-voting districts does not affect changes in Treasury yields. The results are robust to controlling for national inflation.

Finally, we demonstrate that distortions in the target rates, through the lens of our exercise, are nontrivial and do not cancel out when aggregated over time. If voting rights had been allocated to *all* twelve districts (instead of the existing allocation of votes), the path of the target rate would have been different. Importantly, distortions to the target rate could take years to correct. For instance, during the 1976/03–1977/02 rotation, voting districts such as San Francisco and Philadelphia had significantly higher unemployment rates, and counterfactuals suggest interest rates would have been up to 150 basis points higher if all districts had voted equally. Similarly, from 1995 to 2005, target rates would have been about 100 basis points higher had inflation across all districts been weighted equally.

Our paper contributes to several strands of the economics and finance literature. The Fed Governance literature, compared to the burgeoning literature revisiting the design, management, and governance of U.S. Treasury (e.g., Duffie and Krishnamurthy (2016), Duffie (2020), Duffie (2023), among many others), is quite thin and scattered. Most earlier papers study the individual dissent behaviors of FOMC members, regional bias, and their background characteristics at the individual level.[3] Peter

[3] Tootell (1991) and Gildea (1992) use a 1965-1985 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 support the role of regional developments in explaining presidents' interest rate preferences. Chappell Jr, McGregor, and Vermilyea (2008), Jung and Latsos (2015) and Bobrov, Kamdar, and Ulate (forthcoming) revisit these individual-district level tests and find mixed results on regional bias in individual dissent decisions. Other papers study the voting behaviors of FOMC members and their background characteristics (e.g., Belden (1989), Havrilesky and Schweitzer (1990), Havrilesky and Gildea (1991), Chappell Jr,

Conti-Brown's book, "The Power and Independence of the Federal Reserve," sought to renew discussions on the Fed's unique blend of public and private elements and called for more academic research on studying its real impacts (Conti-Brown, 2016). Earlier theoretical work has issued a similar call (e.g., Faust, 1996; Reis, 2013). Our paper documents the *real* impacts of Fed governance, moving beyond the existing discussions focused solely on individual dissent decisions or personal biases. Specifically, we contribute to the ongoing debate by comparing voting and non-voting Reserve Bank presidents and examining their relative effects on *real* FOMC decision outcomes in economically relevant subsamples, a question not previously addressed in the academic literature.

Second, our paper contributes to the macroeconomics literature that studies the determinants of monetary policy decisions. Taylor (1993) demonstrates that past monetary policy rules can be closely tracked by changes in the price level or real income. Coibion and Gorodnichenko (2012) test and contribute to a state-of-the-art Taylor rule that incorporates Greenbook forecasts and accounts for interest rate smoothing. Our benchmark model (see later in Section 5) builds on their work. Several other studies have augmented the state-of-the-art Taylor rule model with local information. For instance, Coibion and Goldstein (2012) estimate a Taylor-rule model similar to the one we use in a 1983-2002 sample period and find that the FFR tends to increase more when inter-regional dispersion is more pronounced. Riboni and Ruge-Murcia (2014) include past dissenting votes and focus on the monetary policy decisions of the Bank of England and the Sveriges Riksbank. In a contemporaneous work, Hack, Istrefi, and Meier (2023) use the FOMC voting rotation as an instrument for the composition of hawks and doves in the FOMC and study the effect of hawk-dove balance on aggregate economic outcomes (e.g., the GDP). To date, to the best of our knowledge, there is no study that exploits the effects of differences in inflation across voting and non-voting districts on the FOMC's aggregate monetary policy decisions.

Third, our paper contributes to the political economy literature that studies the balance of power between various forms of government in general, including the federal government, the states, and municipalities. This gigantic 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)). Our paper contributes to this literature by providing the first evidence on the effects of decision rights allocated to

Havrilesky, and McGregor (1993), Chappell Jr and McGregor (2000), Crowe and Meade (2008), Malmendier, Nagel, and Yan (2021), Bordo and Istrefi (2023), and Conti-Brown and Nygaard (2022)).

Federal Reserve Banks on macroeconomic policy.

Finally, this paper 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) and Lee (2008)) and corporate governance (e.g., Manne (1962), Grossman and Hart (1988), Harris and Raviv (1988), Zingales (1995), Yermack (2010), and 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 the Federal Reserve System (the Fed) and gave it responsibility for setting monetary policy to provide the nation with a safer, more flexible, and more stable monetary and financial system.[4] 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. The modern FOMC 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 have one-year voting 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, her 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

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

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 rotation scheme was established in the 1942 amendment.[5] The rotating seats are filled one Reserve Bank president from each of the following groups: (1) Boston, Philadelphia, and Richmond; (2) Cleveland and Chicago; (3) Atlanta, St. Louis, and Dallas; (4) Minneapolis, Kansas City, and San Francisco. Non-voting 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 a map of the twelve districts. Importantly, since the assignment of voting rights to the presidents of Reserve Banks is specified in Section 12A of the Federal Reserve Act,[6] the public can be, and should be, fully informed about the allocation of voting rights among these presidents.

[Insert Figure 1 here]

The FOMC holds eight regularly scheduled meetings per year.[7] 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 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.

[5] 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: https://www.federalreserve.gov/monetarypolicy/files/fomcmoa19881101.pdf), the FOMC voted to amend the Rules of Organization to change 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. Deviations from the assigned voting scheme are very rare. We explore both the actual and the determined-by-law voting schedule in Section 5.

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

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

3.1. Data Sources

3.1.1. FOMC meetings

We focus on all FOMC events (meetings and conference calls) from January 1969 to December 2019 in which the committee discussed and made decisions about target rates with voting decisions from each voting participant. This informs our main outcome variable, the Federal funds rate ("FFR"), which is considered a standard and consistent measure of monetary policy. Among the 565 FOMC events between 1/14/1969 and 12/11/2019 that we hand-collected from the Federal Reserve website, 472 of them included voting on target rate decisions.[8] 459 are FOMC meetings and 13 are conference calls. For simplicity, we refer to all of them as "FOMC meetings" in the remainder of the paper.[9]

For these 472 meetings, policy statements and meeting proceedings (transcripts or minutes) were released to the public. Policy statements are an important communication tool used by central banks. Transcripts or minutes are the most detailed records of FOMC meeting proceedings and feature precise dialogues between participants. We use 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 with a five-year delay, and the first transcript record from the Federal Reserve archive is the 4/20/1976 meeting.

The black line in Figure 2 displays the time series of the number of actual votes in meetings from 1969 to 2019. While the total number of votes has been largely consistent at 12, we observe time-series variation and several major drops in recent history.[10] 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]

[8] There are 93 FOMC events that we do not study in this paper; they are all conference calls with relatively short meeting times. The topics discussed in these 93 events typically involve decisions on money supply and exchange rates.

[9] The Internet Appendix reports the results of a robustness test in which we drop the 13 conference calls.

[10] 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.

3.1.2. Local economic conditions

The Federal Reserve's dual mandate, established by Congress, outlines two primary goals for the Fed's monetary policy: stable prices and maximum employment. In this paper, we follow the literature and work with inflation and unemployment variables.

Local inflation refers to the inflation rates in the 12 Reserve Bank districts.[11] Because there are no readily available inflation or CPI data reported at the Reserve Bank district level or state level at the FOMC meeting frequency, 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. Internet Appendix Table IA.1 summarizes all data options downloadable from the BLS website at the MSA level and evaluates how suitable they may be to proxy for district-level CPI data based on their time series properties (year coverage and frequency). It is noteworthy that ours is not the first paper to use BLS MSA CPI-U data to proxy for local inflation in finance and economics literature (e.g., Reinsdorf (1994), Coen, Eisner, Marlin, and Shah (1999), Cortes (2008), Bils, Klenow, and Malin (2012), Vavra (2014), Diamond (2016), Stroebel and Vavra (2019), Mian, Sufi, and Verner (2020), among many others).

Given that FOMC meetings happen every month or every other month, CPI data at the monthly frequency is preferred for our research objective as it can realistically capture the incremental local information that becomes available to or known by FOMC members (especially presidents) between two consecutive FOMC meetings. Most of the time, districts have consecutive CPI data at monthly (28.6%), bimonthly (42.8%), or three-month frequency (13.4%),[12] and the sample frequency can vary over time within the same district. To impose consistency across districts, we first construct a database of monthly local inflation rates. For monthly CPI series, monthly inflation is the percentage change in CPI. For other frequencies (bimonthly or three-monthly), we compute the percentage changes between two consecutively-available CPI numbers, divide this by the number of months between them, and use the result to fill the months in between. For instance, for data at bimonthly 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]

Next, we describe how we match FOMC meetings and inflation rates.[14] A naïve

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

[12] The remaining 15.2% corresponds to four district-months with a long period of annual data only: Atlanta (1987-1997), St Louis (1998-2017), Minneapolis (1987-2017), and Kansas City (1987-2017).

[13] In the cases of long periods of annual data only, we do not construct or "invent" monthly inflation rates; we consider these local inflation rates missing in our analysis.

[14] More details can be found in the Internet Appendix IA.1.

match would simply use the inflation rates from the month prior to the meeting month. In the monthly availability case, such a measure exactly captures inflation from the month prior to the meeting. In the bimonthly availability case, such a measure tolerates current information. In the trimonthly availability case, such a measure tolerates both current and future information. Current information could affect (and therefore be useful for) FOMC decisions because district presidents are likely aware of current local economic conditions in the area in which they work and live. Using future information is concerning because measured inflation could be influenced by the FOMC decision.[15] However, it is also not necessarily ideal to use inflation rates from the last measurement available because, in cases of bimonthly or three-monthly availability, there could be another FOMC meeting between the last inflation measurement and the FOMC meeting under consideration.

Given both our research motivations and empirical constraints, we use a measure that is a balance of the naïve match and the strictly past match. Specifically, for each MSA's inflation, our main measure uses inflation with the time stamp $t-1$ as much as possible. One exception is in the trimonthly frequency case when $t-1$ inflation is computed using $t+1$ CPI. In that case, we use past information at time stamp $t-2$. In other words, our main measure tolerates current information but does not tolerate future information.

Lastly, for those districts with multiple CPI data choices, we use the population-weighted measure of inflation across all MSAs (weights according to the United States Census Bureau). We follow the literature and choose population weights given their stable time-series properties (see, e.g., Deaton (2010), Nakamura and Steinsson (2014), Carlino, Drautzburg, Inman, and Zarra (2023)). We then aggregate district-level inflation measures into two variables: inflation in districts with voting rights and inflation in districts without voting rights. Specifically, $Infl_{m,t-1}^{Vote}$ ($Infl_{m,t-1}^{NoVote}$) denotes the average monthly inflation rate among districts with (without) voting rights during the month prior to meeting m. The previous month's U.S. inflation rate is denoted as $Infl_{m,t-1}^{US}$ and is the average of monthly inflation rates across twelve districts. This district-based U.S. inflation rate is highly correlated (88% at the monthly frequency and 94% at the quarterly frequency) with the national CPI-based inflation series available from FRED (see Figure 3). This is not surprising as individual MSA inflation is also based on the CPI for all urban consumers. The inflation variables in this paper

[15]Suppose that CPI data are measured at a trimonthly frequency (e.g., December, March, June) and there is an FOMC meeting in February. If we ignore the timing of the inflation measurement, we would use the imputed January inflation, which is based on the December and March CPI values. This measurement error could influence our analysis results if the February meeting decisions affect the February and March inflation rates.

are all in units of monthly percent.

Local unemployment rates refer to the unemployment rates (UR) in the 12 Reserve Bank districts. The raw data is standard and sourced from the Bureau of Labor Statistics (BLS). BLS releases state-monthly UR series beginning in 1976, which is the longest sample researchers are able to obtain.[16] It is important to note that half of the 50 states span across two Federal Reserve districts. In order to give our data a chance to generate cross-district variation, we first assign each state to a primary Fed district based on population coverage using the Federal Reserve shapefile. We then compute population-weighted averages of unemployment rates (UR) to construct district-level UR measures. As for our voting and non-voting inflation measures, $UR^{Vote}_{m,t-1}$ ($UR^{NoVote}_{m,t-1}$) denotes the average monthly unemployment rate among districts with (without) voting rights during the month prior to meeting m, and $UR^{US}_{m,t-1}$ is the 12-district average. The UR variables are in units of percent.

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 change in the FFR for meetings after June 19, 2019.[17] This allows us to extend our sample through the end of 2019.

FOMC voting districts and dissenters. We collect voting results for each participant in an FOMC meeting – agree or dissent – 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 (1976-2017),[18] and Minutes (2017-2019). We start with the existing effort made by Thornton and Wheelock (2014), whose dataset provides the last names of all

[16]BLS starts to release MSA-level UR data in 1990 in selective regions. For instance, the Massachusetts state-level UR data series starts in 1976 (https://data.bls.gov/timeseries/LASST250000000000003), whereas the Boston-Cambridge-Newton MSA-level UR data series starts in 1990 (https://data.bls.gov/timeseries/LAUMT251446000000003).

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

[18]Transcripts are released on a 5-year delay. As of December 2023 (the time of last data update for the present draft), the last available transcript is the December 12-13, 2017 meeting.

dissenters in a meeting (i.e., 09/21/11, Fisher, Kocherlakota, Plosser). We then expand this dataset to include first, last, and full names, district/board affiliations, and the voting decisions of all voting participants in all FOMC meetings in our sample. This effort results in the most complete FOMC voting database at the meeting-participant level. Other details can be found in our Internet Appendix IA.2.

FOMC transcripts. We download all transcripts available on the Federal Reserve website; the first available file with an interest rate decision is from 4/20/1976 and the last available file is from 12/13/2017. There are a total of 365 files (meetings). Transcripts show detailed conversations among all speakers, word for word. Transcripts of FOMC meetings can be 300 or more pages long, while transcripts of FOMC conference calls typically are 5 to 30 pages long. All transcripts end with a roll call of voting decisions. Transcripts record the entire conversation as it was spoken, including all contributions from governors, district presidents who have votes, district presidents who do not have votes, Fed economists, and other accompanying and meeting staff.

Capital market variables. Daily Treasury yield rates are obtained from standard sources (i.e., Refinitiv DataStream). To construct daily Federal funds futures rates, we follow the literature (e.g., Kuttner (2001), Bernanke and Kuttner (2005), Gürkaynak (2005)) and use the implied rates of the "30 Day Federal Funds" contracts averaged across all available terms, which are readily downloadable from Refinitiv DataStream starting in 1989. We denote changes in the Fed funds future rates from the end of the previous meeting $m-1$ to the end of the current meeting m as Δf_m. Internet Appendix Section IA.4 offers more data details.

3.2. Summary Statistics

Summary statistics for key variables used in our analysis are presented in Appendix Tables A1, A2, and A3. In this section, we document two important observations that are useful for our empirical design. First, about 9% of presidents' votes at meetings from 1969 to 2019 are dissent votes. In fact, 35% of the meetings end up with at least one president dissenting, meaning that their opinions are not fully reflected in the consensus decision that is being voted on at the end of the meeting.

Second, during our sample period, the average (median) change in the FFR is -0.010% (0.000%). The average monthly U.S. inflation rate prior to FOMC meetings is 0.35% (or around 4% per annum), and the average voting and non-voting district inflation rates are both 0.35% as well. The unconditional correlation between the voting and non-voting inflation series in the full time-series sample is, as expected, high. A simple rolling correlation calculation using 50 FOMC meetings would fluctuate between 48% and 95% with an average at around 80%. This observation signals time-varying dispersion among local inflation. Voting and non-voting district UR exhibit similar magnitudes, at 6.12% and 5.95% respectively, and are generally more correlated than their inflation counterparts.

Figure 3 shows a close resemblance between the 12-district average of local inflation (our construction) and the aggregate inflation series directly provided by FRED. This serves as a useful sanity check, supporting the quality of the local macroeconomic data used in our analysis.

[Insert Figure 3 here]

4. Preliminary Results

4.1. Textual Analysis

In this section, we use FOMC transcripts to show that establishments and organizations in districts with voting rights are mentioned more often and "favored" more than those in districts without voting rights. This result thus highlights the role of Reserve Bank presidents' voting rights in shaping FOMC decisions, providing motivation for our main specification developed in Section 5.

First, we perform a simple descriptive analysis of the relationship between voting rights and mentions of districts' keywords by governors. A district's keywords include geographical highlights (taking the Richmond Fed as an example: the District of Columbia), federal agencies (e.g., NASA), universities (e.g., John Hopkins University), the headquarters of well-known businesses or banks (e.g., Marriott, Capital One), and newspapers (e.g., the Daily Press) in that district.[19] A keyword that can be linked to a district is mentioned by either governors (chair or non-chair) or Reserve Bank presidents (voting or non-voting). According to the summary statistics in Table A1, presidents of Reserve Banks are more likely than governors to speak about district conditions. The average number of times a keyword that can be linked to a district is mentioned by a governor (a Reserve Bank president) is 0.73 (3.09). The two averages are statistically different from each other.

We test our hypothesis that voting districts are being mentioned and discussed more often during FOMC meetings below. Specifically, we estimate the following

[19]Due to its length, the full list is not included in the draft but is available upon request.

regression:

$$DistrictMentions_m^i = \alpha_m + \beta Vote_m^i + \varepsilon_m^i, \tag{1}$$

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 maximum transcript sample available at the time of our research covers the 1976-2017 period. The unit of observation is meeting-district; that is, for each meeting, there are 12 data points.

[Insert Table 1 here]

The results are reported in Panel A of Table 1. Various columns report estimates of the same specification using different word samples to search for district keywords, as indicated in the table header. Column (1) considers speech samples from all governors and presidents. We find a positive and significant relationship between 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. Specifically, districts with voting rights have 0.766 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 3.81. That is, a district is 20.1% more likely to be mentioned if its president is a voting member of the meeting.

We further decompose district keywords mentioned by presidents and governors. The results shown 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 0.3692 (0.3968) more keywords mentioned by governors (presidents) than districts without voting rights do. This is an economically sizable result, indicating that districts with voting rights are 51% (13%) 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 is also displayed in Internet Appendix Figure IB.1, in which we calculate and plot the yearly average number of district-linked keywords spoken by governors that can be linked to a district having a vote or not during our sample period.

Columns (6) and (7) use speech samples from voting and non-voting district presidents, respectively. Our evidence confirms 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.

Finally, Panel B of Table 1 presents our second textual analysis that studies the attitude of governors toward districts. We construct three measures of governor attitudes towards an individual district: a measure of similarity between governors' speech and a district president's (Column (1)), a categorical variable indicating positive/neutral/negative sentiment toward this district (Column (2)), and a continuous measure of sentiment toward this district (Column (3)). From Panel B of Table 1, the results across all three measures indicate that governors express more positive sentiment and agreement towards voting districts than towards non-voting districts. For instance, Column (1) indicates that governor agreement is 9.18% higher with voting districts than towards non-voting districts. This is an economically sizable difference, given that the unconditional agreement score is 0.22.

4.2. The Exogenous Rotation of FOMC Voting

The predetermined, rather mechanical rotating structure of FOMC membership is a key factor in our empirical analysis. We present two pieces of evidence in support of the exogeneity of the voting rotation.

First, Panel A in Table 2 shows that the intended voting scheme indeed closely tracks with the actual voting scheme. The likelihood of a mismatch between the actual voting status and the prespecified voting status of a district is 1%, indicating that the predetermined voting scheme is closely followed. When we regress an indicator of a district's president voting during a meeting on her prespecified voting status during that meeting, we find that the coefficients exceed 0.91 and are highly statistically significant with large F-statistics.

[Insert Table 2 here]

In the sample period, which runs from 1969 to 2019, there are 58 instances in which district presidents voted when they should not have according to the 1942 law and the Alternate Member schedule (58/5,664=1.0%, as displayed in the table). When we report our main results, we perform an important validation test in which we use not the actual voting status of district presidents, but rather the one that corresponds to the 1942 law. That is, we use voting status as determined in 1942 and find that using actual voting status does not affect the results.[20]

[20]Small deviations in the voting rotation are expected due to health issues or other reasons, such

Second, we show that whether or not a district's president will be able to vote during next year's FOMC meetings is uncorrelated with the district's recent economic conditions. Panel B in Table 2 shows that there is no significant relationship between local inflation or unemployment rate and whether a district's representative can vote in an FOMC meeting. The results of these two tests support the assumption that we can treat the variation in district presidents' voting rights as exogenous to local economic conditions and to the outcome variables we consider.

5. Main Results

In this section, we use the exogenous rotating structure of FOMC voting to decompose national macro variables into inflation in voting and non-voting districts and then provide the first evidence on the real implications of the rotating structure of FOMC voting.

5.1. Empirical Strategy

In this section, we conceptualize the necessary empirical conditions for economic conditions in voting presidents' districts to have an effect on FFR decisions. First, the FFR must be a relevant policy tool. In our setting, this means that the FFR needs to be above the zero lower bound (ZLB), because when the FFR is at the ZLB, the FOMC is focused on quantitative monetary tools. During our sample period (1969-2019), the FFR was at the ZLB for 57 meetings. Plot (a) in Figure 4 shows that the FFR was above the zero lower bound ("No ZLB"=1) before December 2008 and after December 2015.

[Insert Figure 4 here]

Second, when voting district presidents disagree with the FFR decision, they express it through dissent votes. When voting presidents choose not to dissent, it is likely that they have already influenced FOMC decisions. In other words, when there are no dissent votes on the FFR, this consensus decision should reflect the voting

as a power transition (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 5). 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).

presidents' views and address their local conditions. As a result, to best test our hypothesis, we focus on FOMC meetings in which no district president dissents; this amounts to 306 meetings during our sample period (1969-2019). Plot (b) in Figure 4 illustrates that meetings with no dissenting presidents ("No Dissenters"=1) were fairly evenly distributed throughout the sample period.

Third, local economic conditions in voting presidents' districts should only matter when there is significant dispersion in economic conditions across districts. For instance, if inflation and unemployment values are similar across districts, the assignment of voting rights at the FOMC becomes less consequential. Building on this insight, we categorize FOMC meetings into two groups based on dispersion in local economic conditions across districts: high (above the median) and low (below it) dispersion. As a measure of inflation dispersion, we use the maximum-minimum spread of the past twelve-month annual inflation rates among the twelve districts, scaled by the recent three-year average U.S. inflation rate. Given that our sample covers significant shifts in U.S. inflation levels (Evans and Wachtel, 1993), we choose to scale the spread using smoothly-varying aggregate variables. Similarly, for UR dispersion, we use the maximum-minimum spread of the past twelve-month average unemployment rates among the twelve districts, scaled by the recent three-year average U.S. unemployment rate.

Plot (c) of Figure 4 illustrates high (solid) and low (hollow) dispersion subsamples for each macro variable. We note that UR dispersion is much smaller than inflation dispersion, averaging around 51.5% of inflation dispersion. The difference in dispersion rates is statistically significant, with paired t-statistic $= 40.9$ and unpaired t-statistic $=$ 27.9. Thus, whereas we can always divide the sample into high and low UR dispersion, the cross-district variation in UR is economically more modest than that in inflation.

As a result, we assign meetings where the FFR could move in both directions, and where all voting presidents reached consensus, despite high inflation dispersion to the "inflation effective subsample." There are 142 FOMC meetings between 1969 and 2019 satisfying the effective criteria. The remaining 330 meetings – the ZLB meetings, meetings with voting president dissents, or low inflation dispersion FOMC meetings – form the "inflation placebo subsample." Since our Greenbook sample ends in 2017, inflation effective and placebo subsamples consist of 130 and 326 meetings, respectively. We similarly construct a "UR effective subsample" of interest that incorporates periods with no ZLB, no president dissents, and high UR dispersion, as mentioned above. All other observations are assigned to the "UR placebo subsample." Given that the unemployment data starts in 1976, the UR effective and placebo subsamples consist of 111 and 256 meetings, respectively.

5.2. The Effect of Local Economic Conditions on the FFR

In this section, we present the main result of our paper — the effect of local economic conditions and the FOMC's voting structure on the FFR. The main outcome variable is the change in the Federal funds target rates between meetings. Since Taylor (1993), the literature has enhanced the reduced-form Taylor model by including lagged target rates and using Greenbook forecasts to capture aggregate expectations (e.g., see Coibion and Gorodnichenko (2012) for a state-of-the-art discussion).

The Taylor rule is forward looking, and therefore, in its empirical adaptation, the recent literature uses the Greenbook to obtain the Federal Reserve Board of Governors' staff members' forecasts for the aggregate economy, typically collected within the system a week before each FOMC meeting. Our paper has a different objective. We are examining whether voting districts influence FOMC consensus decisions in response to local macroeconomic conditions. To the best of our knowledge, there is no existing and publicly available dataset that captures each Federal Reserve president's *local* inflation or unemployment rate projections, surveyed before each FOMC meeting. As a result, we use recent past local macro variables to capture the district-level incremental information generated between meetings.

We estimate the following specification:

$$\Delta FFR_m = \alpha + \beta_1 Local\ Conditions^{Vote}_{m,t-1} + \beta_2 Local\ Conditions^{NoVote}_{m,t-1} \\ + \sum_{k=1}^{K} \tau_k FFR_{m-k} + \delta_1 E_m(Infl_{q1}) + \delta_2 E_m(UNEMP_{q1}) + \delta_3 E_m(gGDP_{q0}) + \varepsilon_m, \tag{2}$$

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, we use two monthly local variables to proxy for $LocalConditions$: inflation and unemployment rates. $Infl^{Vote}_{m,t-1}$ is a voting district's last average monthly inflation rate prior to meeting m, and $Infl^{NoVote}_{m,t-1}$ is the last average monthly inflation rate for non-voting districts. $UR^{Vote}_{m,t-1}$ and $UR^{NoVote}_{m,t-1}$ are defined in an analogous way. FFR_{m-k} is the Fed funds target rate from meeting $m-k$. We allow for interest rate smoothing (lagged FFR terms) up to the third order. We follow Coibion and Gorodnichenko (2012) and focus on using $E_m(Infl_{q1})$ (the one-quarter-ahead forecast of GDP deflator inflation), $E_m(UNEMP_{q1})$ (the one-quarter-ahead forecast of the unemployment rate), and $E_m(gGDP_{q0})$ (the current-quarter nowcast of real GDP growth) to best capture an empirical Taylor Rule benchmark; results are robust with the horizon choices. The unit of observation is one FOMC meeting.

[Insert Table 3 here]

We analyze the effect of each local variable *separately* within its respective effective and placebo subsamples. Panel A of Table 3 analyzes inflation, while Panel B focuses on the unemployment rate (UR).

We discuss Panel A first. Column (1) reports the baseline aggregate framework using the 1969-2017 (full) sample.[21] In Columns (2) and (5), we estimate the same specification as in Column (1) using the inflation effective and placebo subsamples, respectively. The coefficient estimate for the Greenbook national inflation forecast slightly increases and remains significant in both subsamples. The coefficients for the Greenbook real variables are significant in the placebo subsample only.

Columns (3) and (6) of Panel A show the main result. When we split national inflation into inflation averages in voting and non-voting districts, we find that the relationship between inflation and changes in the FFR is significant for voting districts in the inflation effective subsample. In terms of economic magnitude, the estimates in Column (3) indicate that a one SD increase in the voting district average inflation in the last month predicts a 0.29 SD or 13.7 basis point increase in the next FFR. In contrast, there is no such relationship for a non-voting district's inflation. On the other hand, in the inflation placebo subsample, local inflation in both voting and non-voting districts has no significant effect on the FFR. Moreover, the coefficients of the Greenbook variables remain largely unchanged from Column (5) to Column (6), while in the effective sample the significance of the Greenbook inflation coefficient observed in Column (2) is absorbed by our voting-group inflation variable.

To further demonstrate that our decomposition result is not driven by randomness or noise, we simulate 5,000 voting paths from 1969 to 2019. For each voting year, we reassign FOMC votes: New York always votes, and the four remaining voting seats are randomly selected from the remaining eleven districts. For each simulated voting path, we recalculate the average voting and non-voting inflation series and recompute the coefficient and t-statistics of these two series in the inflation effective and placebo subsamples.[22]

[Insert Figure 5 here]

Plot (a) in Figure 5 displays the distribution of the voting inflation t-statistics in the inflation effective subsample, with the red bar indicating t-statistics that correspond to the actual voting scheme (Column (3) of Table 3, Panel A). We find that

[21] Appendix Table IB.1 shows how each of the three Greenbook forecast variables enter the regression.

[22] The two subsamples remain unchanged in each simulation because they are constructed using the max-min spread.

it would be extremely rare (3.00%) for voting inflation under a random voting schedule to exhibit statistical significance as high as that observed under the actual voting schedule. In other words, if the estimated coefficients captured randomness or noise, the likelihood of the voting coefficient being as significant as it is in our main specification would be very low. We report this randomness likelihood in the last row of Table 3. We further demonstrate that the absence of statistical significance for the voting inflation measure in the placebo subsample is also *not* a random result. Both likelihoods strengthen our confidence that the results are not driven by randomness, noise, or measurement error, as such factors would otherwise need to be systematically correlated with the exogenous voting rotation.

We conduct similar analyses using unemployment rates and present the corresponding estimation, economic magnitude, and simulation results based on their effective and placebo subsamples. Panel B of Table 3 shows that the findings for the unemployment rate are qualitatively similar to the findings for inflation, which the expected sign. Column (3) of Panel B reports our main result: a one standard deviation increase in the voting district average unemployment rate in the prior month predicts a 0.54 standard deviation (or 48.0 basis point) decrease in the subsequent federal funds rate (FFR), significant at the 10% level.[23] The simulation result, shown in the last row of the panel, suggests a very low probability (3.62%) that the significant effect of voting UR on the FFR is due to randomness or noise. In contrast, Column (6), based on the UR placebo subsample, shows an insignificant effect. Plot (b) in Figure 5 uses simulation to demonstrate that the significant voting UR coefficient is unlikely a result of randomness or noise. Lastly, our main results remain robust when conference calls are excluded (see Appendix Table IB.2).

5.3. Robustness Tests

We perform several robustness tests of inflation timing decisions. Unlike unemployment rates, inflation data is not reported on a strictly monthly basis in a way that allows us to cleanly extract recent information prior to each FOMC meeting. However, it is plausible to assume that district presidents possess up-to-date information about local inflation in real time. As a compromise – detailed in Section 3.1.2 – our main inflation measure incorporates current-month inflation when the FOMC meeting occurs in the same month as the CPI release, and the previous release dates back two or three months.

[23] As noted in Section 5.1, the cross-district dispersion of the UR is substantially smaller than that of inflation, both economically and statistically. Therefore, we should interpret the weaker results for the UR subsamples with caution.

Table 4 demonstrates that our results are robust to the timing choices with similar economic magnitudes across the specifications. Columns (2)-(4) show a significant relationship between FFR changes and voting district inflation, which translates to a 0.25-0.30 SD increase in ΔFFR per unit of SD increase in voting district inflation, compared to 0.29 SD using our main measure. Inflation for non-voting districts remains insignificant across all robustness tests. The randomness tests at the bottom of the tables consistently indicate an extremely low probability (around 2%–5%) that our results are driven by randomness or noise.

[Insert Table 4 here]

As outlined and motivated in Section 3.1.2, we believe that our default inflation measure and empirical approach are the most appropriate for addressing our research question. A primary limitation of alternative inflation series is their quarterly frequency. For example, we considered the state-level quarterly data provided by Hazell, Herreño, Nakamura, and Steinsson (2022), as described in Internet Appendix IA. We demonstrate that the the change from monthly to quarterly frequency is an economically sizable change in Appendix Table IB.3. In this exercise, we deliberately collapse our MSA-based monthly inflation data into district-quarterly frequency and re-run our main specification with inflation. We also examine district-quarterly real personal income growth (sourced from state-level quarterly data by the U.S. Bureau of Economic Analysis) in Column (4). Overall, we find that results based on quarterly measures tend to be considerably weaker, even when using our current MSA-monthly dataset. Because there are typically two FOMC meetings per quarter, quarterly indicators may either miss incremental changes between meetings or already reflect policy responses to earlier meetings. As a result, such tests suffer from limited variation and reduced statistical power.

5.4. Cross-district Heterogeneity

In 1942, an amendment to the Federal Reserve Act permanently allocated a voting seat on the Federal Open Market Committee (FOMC) to the Federal Reserve Bank of New York. Prior to this legislative adjustment, between 1935 and 1942, the New York Fed shared a rotating voting seat with the Federal Reserve Bank of Boston. Historical accounts illustrate that Allan Sproul, then-president of the New York Fed, regularly asserted dominance in monetary policy discussions, effectively neutralizing Boston's voting influence by informally representing both districts' votes.[24]

[24]See Federal Reserve Governor Laurence H. Meyer's speech at the Gillis Lecture, Willamette University, Salem, Ore., on June 1, 1988 that detailed these historical accounts of New York Fed and

This prompted the Boston Fed to lobby Congress for a restructuring of voting arrangements to ensure more equitable representation (Conti-Brown, 2016). Recognizing New York's central role in managing open market operations and its disproportionate influence during rotations, Congress formalized New York's permanent voting seat. This legislative maneuver underscores that districts actively advocate to secure their voting power at the FOMC.[25]

Is there cross-district heterogeneity in ability to influence FOMC decisions? We use our unique framework and a jackknife exercise to explore the "power" of each Federal Reserve district at the meeting. Specifically, we drop the entire history of one district (at a time) from our analysis, re-construct voting macro variables, and then re-estimate the coefficients in the effective subsamples. If the explanatory power of voting macro variables decreases, that is an indication that this district has more power.[26]

Panel A of Table 5 presents the results for inflation. We find that most re-estimated voting group coefficients remain at an economic magnitude similar to the main specification (based on all 12 districts). The Chicago district stands out in terms of the decrease in the coefficient. When the voting rotation was created in 1942, Chicago, which at the time served as a national logistics hub with substantial industrial and agricultural activities, received special treatment and was chosen to vote every other year, with Cleveland taking the alternate years. Most other districts vote every three years. Moreover, the Chicago Fed is also known for their research initiatives, like the National Activity Index (CFNAI), which aggregates regional data, including inflation, to measure nationwide economic activity. Chicago inflation, therefore, directly influences key analytical tools used by the broader Federal Reserve System. These governance features could lead to stronger implicit power.

[Insert Table 5 here]

Panel B of Table 5 presents the results for the unemployment rate. We find that the UR for voting districts remains negative and significant for six districts. For the remaining six districts, the coefficient is negative but statistically insignificant. This is not surprising since the UR for voting districts is marginally significant (at 10% level) in the main specification due to lack of time-series and cross-district variation, as discussed earlier.

Boston Fed: https://www.minneapolisfed.org/article/1998/come-with-me-to-the-fomc?utm_source=chatgpt.com

[25]We thank Peter Conti-Brown for pointing us to this episode.

[26]We are loosely defining term "power" in this exploratory exercise and it is worth further investigation).

6. Implications

In this section, we investigate implications for the capital market and an important counterfactual case.

6.1. Implications for Capital Markets

We test whether inflation in voting districts affects futures and Treasury markets. First, we examine Federal funds futures. Specifically, we estimate the following specification:

$$\Delta f_m = \alpha + \beta_1 Infl^{Vote}_{m,t-1} + \beta_2 Infl^{NoVote}_{m,t-1} + \tau FFR_{m-1} + \varepsilon_m, \quad (3)$$

where Δf_m denotes the change in the average Federal funds futures rate from the day after the previous meeting to the last day of this meeting (1989-2019). $Infl^{Vote}_{m,t-1}$ and $Infl^{NoVote}_{m,t-1}$ denote recent past inflation in voting and non-voting districts, respectively, as previously defined. FFR_{m-1} is the last meeting's FFR level. We also conduct the analysis using $Infl^{US}_{m,t-1}$ as a control variable. Note that market participants do not learn about Greenbook forecasts in real time; therefore, the regression is based on BLS inflation, which is released regularly. In the inflation effective subsample, there are 96 meetings for which Δf_m is available, whereas in the UR effective subsample, only 25 such meetings exist. Therefore, we focus on local inflation in this exercise.

Table 6 reports the results. Column (1) validates that the recent month's national inflation rate is a positive and significant predictor of an increase in FF futures rates. When we decompose the national inflation rate into rates for voting and non-voting districts in Column (2), we find that only inflation for voting districts has a significant effect on FF futures rates. A one SD increase in a voting district's inflation rate in the last month leads to a 0.48 SD or 17.3 basis point increase in Δf_m, significant at the 1% level. In Column (3), we show that the voting effect on the market's expectations of the FFR remains positive and significant after controlling for national inflation.

Columns (4)–(9) repeat the analysis by decomposing Δf_m into two components: changes in the Federal funds futures rate (FFF) from the day after the previous meeting to the day before the current meeting, and changes from the day before to the last day of the current meeting. We find that market participants price voting inflation into the futures market prior to the meeting, while non-voting inflation remains statistically irrelevant. This finding is plausible, as media discussions of the Federal

Reserve frequently highlight the voting rotation and its implications.[27]

[Insert Table 6 here]

Next we use the changes in yields for 3-month (short term) and 5-year (long term) maturity Treasury bonds as dependent variables. Specifically, the dependent variable is $\Delta yield_{(-4,h)}$, the yield difference from 4 weeks prior to the meeting to h weeks after the meeting, where $h = \{-2, -1, 0, +1, +2\}$. Yield rates (and hence their level changes) are in units of percent per annum. Then we estimate the same specification as in Equation (3). To conserve space, Table 7 reports relevant coefficient estimates and their standard errors.

[Insert Table 7 here]

The results, shown in Panel A of Table 7, indicate that inflation in voting districts has a significant effect on changes in Treasury yields. The effect is already statistically significant for short-term yield changes over the period from Week -4 to Week -1, suggesting that bond market investors price in voting district inflation prior to the FOMC meeting. This finding aligns with the futures market results discussed above. In terms of economic magnitude over the (-4, 0) window, a one standard deviation increase in voting district inflation is associated with a 10 basis point (or 0.28 standard deviation) increase in the yield change of 3-month Treasury bonds.

The effect becomes statistically insignificant for 5-year Treasury yields (except the (-4, +1) window), which is consistent with our interpretation that the primary pricing channel operates through expected interest rates rather than risk premia — given that risk premia account for a substantial share of the variation in long-term yields. Panel B uses U.S. inflation as a control, and coefficient estimates largely remain similar, though less significant statistically.

Panels C and D of Table 7 examine unemployment rates and their respective effective subsamples. Consistent with our main findings in Section 5, the results using the UR are statistically weaker. Nonetheless, the pattern of coefficient magnitudes mirrors that observed with inflation, as discussed above.

6.2. Monetary Policy Implications

Our empirical estimates of the voting variables give us a chance to quantify potential distortions in the conduct of monetary policy that are induced by the allocation

[27] In Internet Appendix IA.3, we include two screenshots of recent mainstream news articles that analyze the Federal Reserve's outlook for 2024 and 2025. These articles prominently discuss the voting rotation and its implications.

of voting rights to five out of twelve Reserve Banks. In this section, we demonstrate the economic magnitude of the distortions in question and then explore an important counterfactual.

We begin by investigating how large the potential distortion could be. To simplify the message, we consider two extreme counterfactual cases. In each period, we reallocate the voting rights of the four rotating districts to the four districts with the lowest level macro variable values, referred to as the "Min(4)" case. The second counterfactual, "Max(4)," assigns voting rights to the four districts with the highest macro variable values in each period. Figure 6 displays the difference between the counterfactual average and the actual voting group average, scaled by the sample standard deviation of the latter. For illustrative purposes, we plot yearly averages. When the four rotating votes are allocated to districts with the lowest or highest inflation or unemployment rates, the resulting distortion often exceeds one standard deviation of the actual voting group's macro variable values. Thus, the allocation of voting rights to only a few Reserve Banks can lead to potentially meaningful distortions in FFRs.

[Insert Figure 6 here]

While the analysis in Figure 6 implies that a distortion to ΔFFR can be large, there is a possibility that these distortions cancel out as one looks at the path of FFR targets. We therefore next consider the counterfactual path of FFRs. 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.[28] The Banking Act of 1935 (amended again in 1942) superseded this, creating the FOMC's modern structure and introducing the voting rotation. We therefore analyze the counterfactual path of target rates under the assumption that voting rights are assigned to all Reserve Bank presidents *equally*.

To perform this counterfactual analysis, we replace the actual voting district inflation series with the counterfactual series. We fix all coefficient estimates from the inflation effective subsample analysis and other data inputs of the estimated regression of the inflation effective subsample. The counterfactual path of ΔFFR can then be computed. Similarly, we replace the actual voting district UR series with the counterfactual series and apply the regression coefficient estimates from the UR effective subsample to compute the counterfactual path of ΔFFR. For both the inflation and the UR placebo subsamples, we set the counterfactual path of ΔFFR to be the actual ΔFFR. This is to assume that there is no distortion accumulation caused by the

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

voting schedule for these subsamples. Finally, we add up both counterfactual paths of ΔFFR and iteratively compute the counterfactual target rate.[29]

The top panel of Figure 7 presents the counterfactual target rate generated from this simple exercise. The path of the target rate would have been different if all bank presidents had voted, and the difference between the counterfactual and actual rate can reach up to 150 basis points. For instance, during the 1976/03-1977/02 rotation, voting districts such as San Francisco and Philadelphia exhibited significantly higher unemployment rates than non-voting districts. The counterfactual exercise suggests that the interest rate would have been higher if all 12 districts had equal voting rights. As another example, during the 1995-2005 period, the decade before the 2007-08 crisis, target rates would have been higher by about 100 basis points if inflation in all districts had been taken into account equally. Importantly, such voting-related distortions to FOMC decisions do not appear to cancel out after two or three years.

[Insert Figure 7 here]

The bottom figures in Figure 7 quantify the effect of distortions to FOMC decisions in Fed funds, REPO, and Treasury Markets. We plot the product of the distortion to the FFR and the annual snapshots of the sizes of these markets (sources: the FRB and the Dallas Fed). The underlying rate changes in these three markets are highly responsive to changes in the FFR. Therefore, the dollar magnitude of the distortions is on the conservative side. Through the lens of this exercise, distortions to the FFR translate into tens of billions of dollars in the Fed funds, REPO, and Treasury markets. Many other classes of financial and real assets affected by target rates, such as corporate bonds, loans, and mortgages, are not included in this analysis, which further suggests that our estimates are conservative.

7. Conclusion

In this paper, we identify meetings during which the inflation and unemployment rates in voting presidents' districts led the Federal funds target rate (FFR) to diverge from what it would have been if average information had been used. Consistent with economic conditions in voting presidents' districts playing a larger role in FOMC meetings than those of non-voting presidents' districts, we show that voting presidents'

[29] There is a caveat in the counterfactual analysis. Specifically, the analysis does not incorporate the effect of changes in FOMC voting procedures on inflation for voting and non-voting districts. Developing a model that incorporates these effects is a fruitful avenue for future research.

districts are more likely to be mentioned and favored in discussions than are the districts of non-voting presidents.

In terms of economic significance, the economic conditions in voting districts affect Taylor rule regressions in a profound way and have large effects on financial markets. Market participants understand this and price the effect of local inflation on FOMC decisions accordingly. Our empirical strategy relies on the exogenous rotation of voting rights between Reserve Bank presidents. In a counterfactual analysis, we find that the path of the target rate would have been different if all districts affected FOMC decisions equally.

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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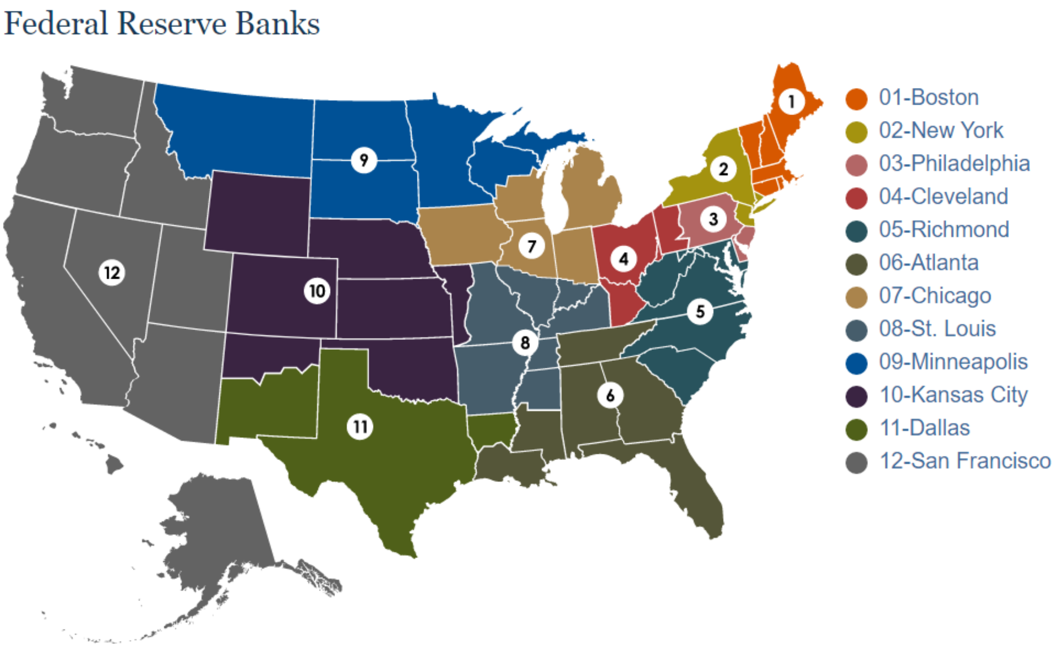


Figure 1: **Federal Reserve Banks.** Source: https://www.federalreserve.gov/aboutthefed/structure-federal-reserve-banks.htm

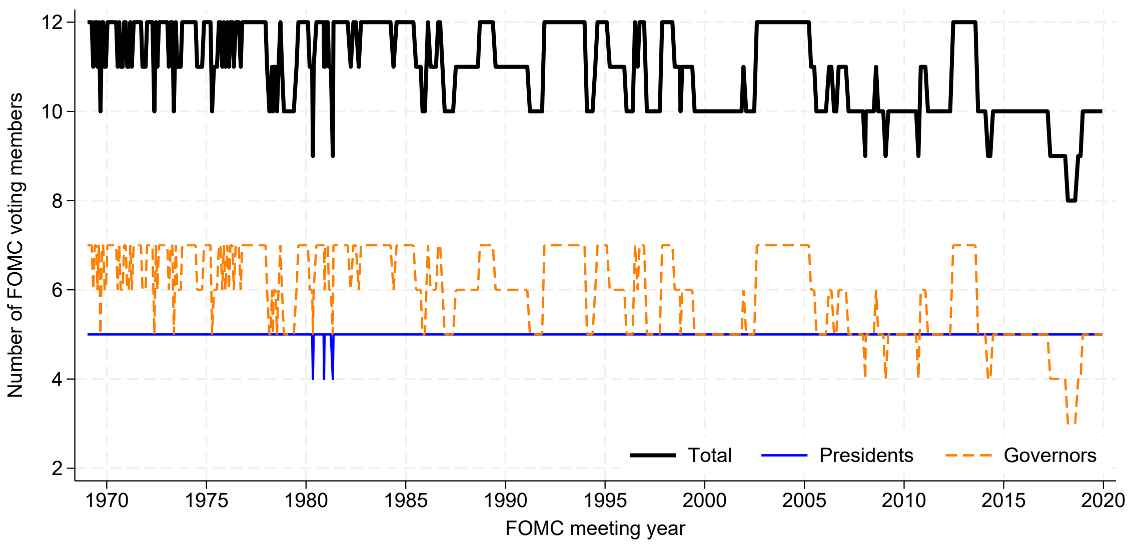


Figure 2: **Number of voting members at FOMC meetings.**

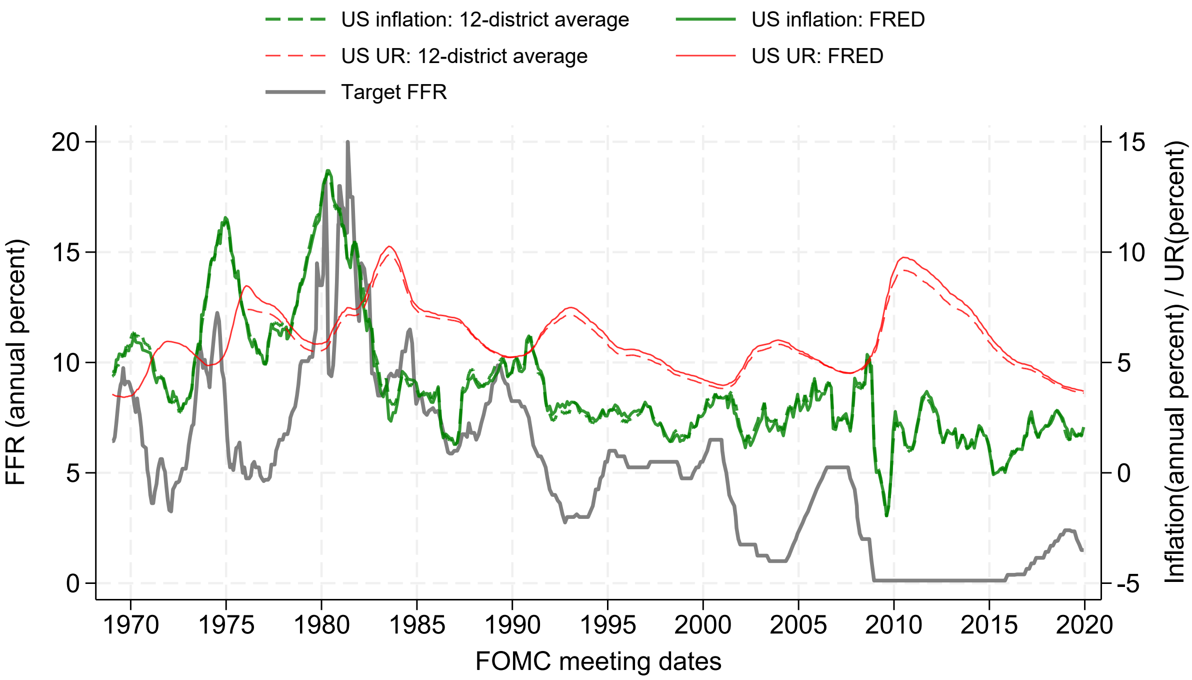
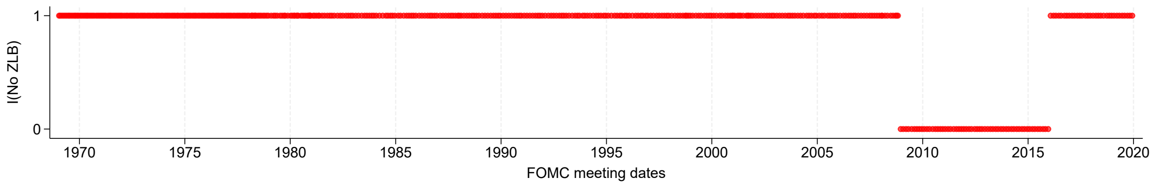
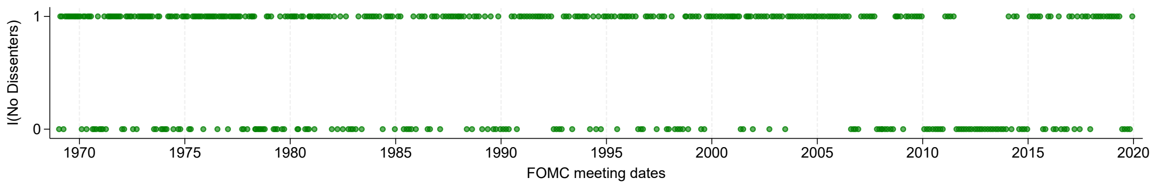


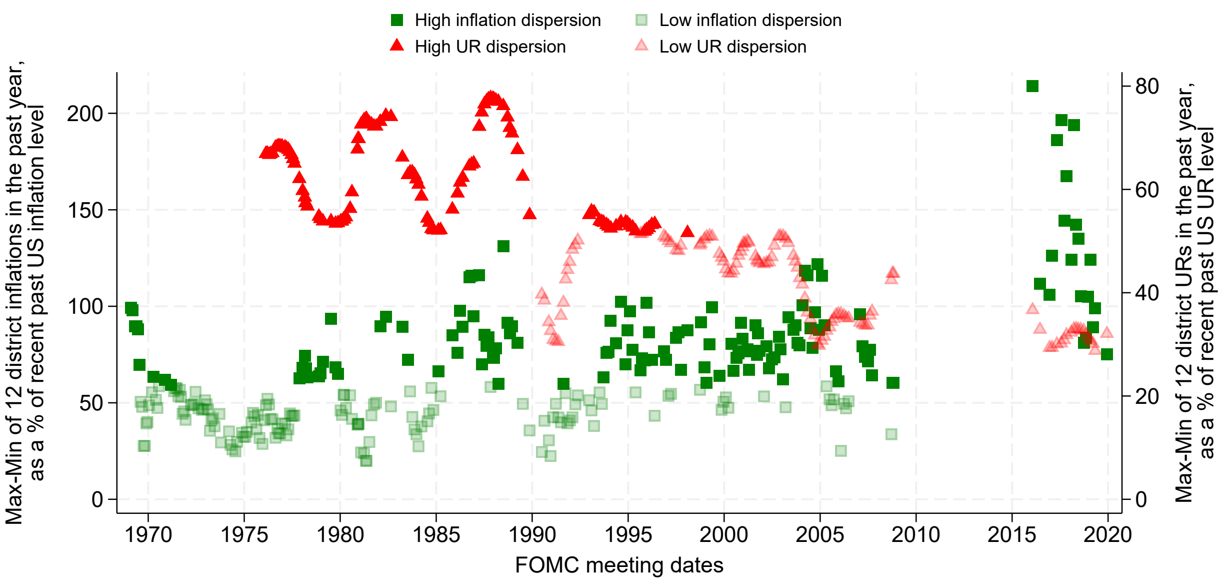
Figure 3: **Time Series of Key Variables.** This figure depicts our major aggregate time series to visualize our data quality. The solid gray line (corresponding to the left y-axis) shows the time series for the target FFR. The two thicker green lines (right y-axis) depict the time series of U.S. inflation measures (unit: annual percent); the dashed green line is the 12-district average of yearly inflation rates, based on our district-level inflation construction (source: BLS, authors' calculations), while the solid green line is the yearly U.S. inflation computed using the available aggregate CPI series (source: FRED). The two series are 99.73% correlated. Similarly, the two thinner red lines (right y-axis) depict the time series of U.S. unemployment rates (unit: percent); the dashed red line is the 12-district average of yearly UR (source: BLS, authors' calculations), and the solid red line is the yearly U.S. UR (source: FRED).



(a) Indicator of No Zero-Lower-Bound (=1)

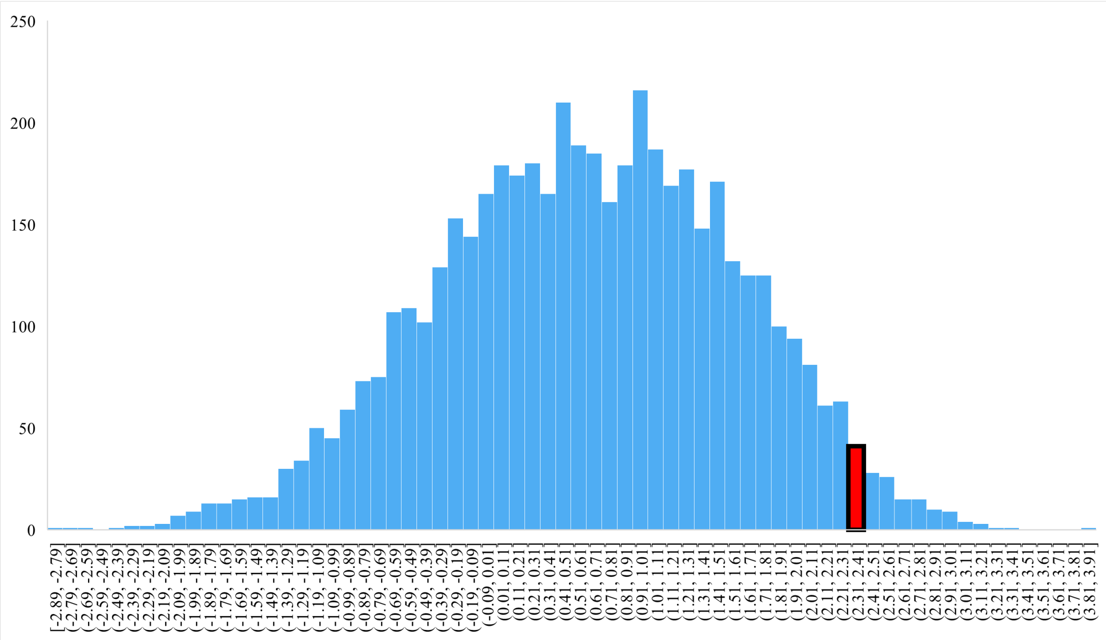


(b) Indicator of No President Dissents (=1)

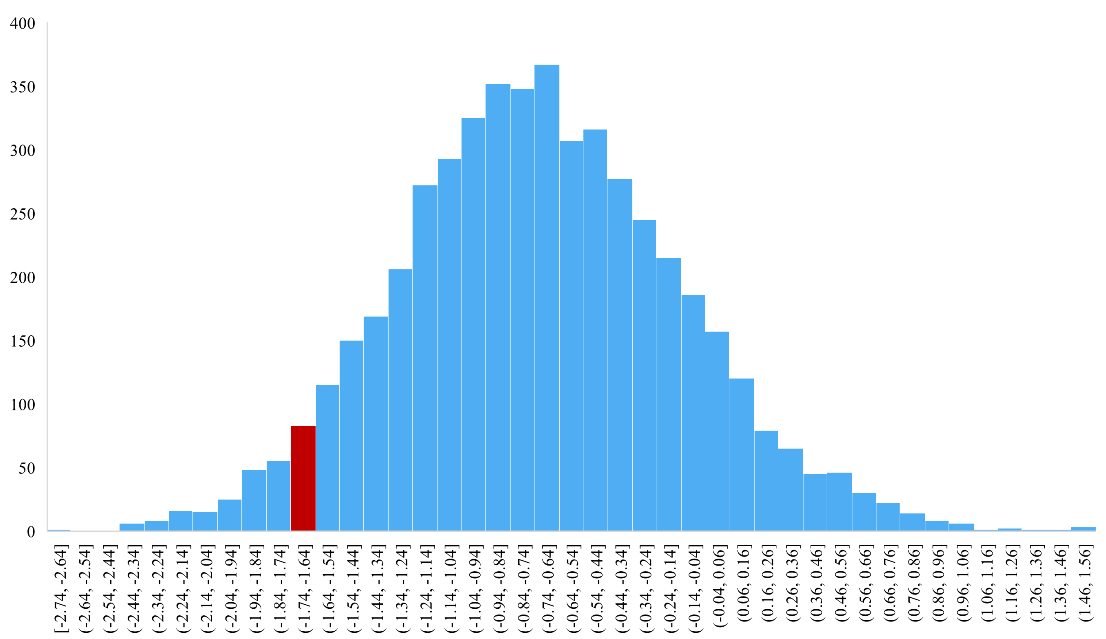


(c) Dispersion.

Figure 4: **Effective and Placebo Subsamples.** This figure demonstrates the construction of our effective and placebo subsamples. Plots (a) and (b) demonstrate meetings without the ZLB and meetings without dissenters, respectively. Plot (c) shows meetings with high versus low dispersion (squares = inflation; triangles = UR), conditional on no ZLB and no dissenters. We proxy inflation (UR) dispersion using the max-min spread of inflation rates (UR) over the past 12 months across the 12 districts, scaled by the U.S. inflation level from the recent past three years. Other details are discussed in Section 5.1.

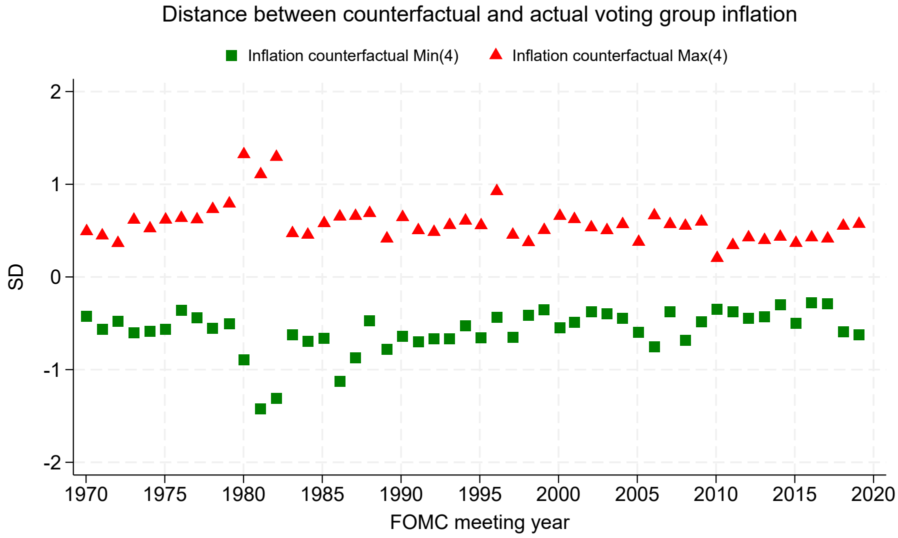


(a) Inflation

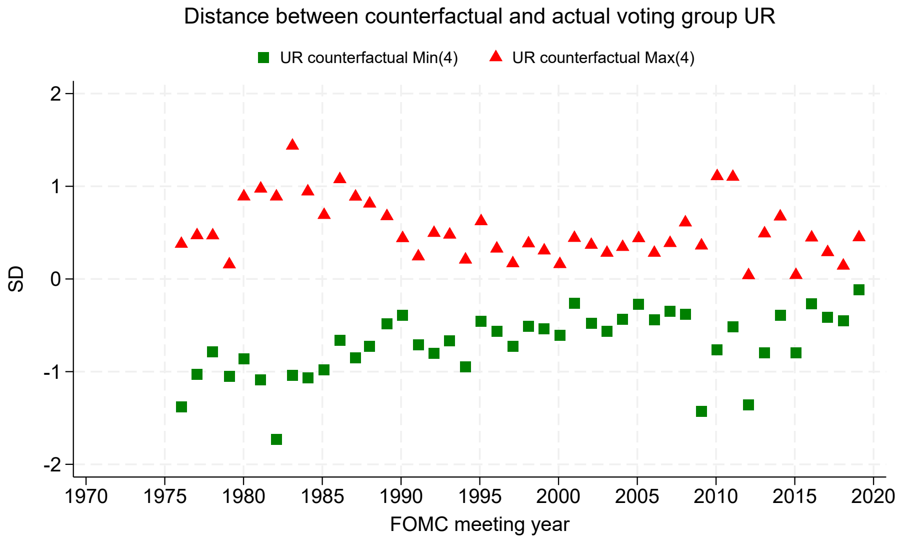


(b) Unemployment Rate

Figure 5: **Monte Carlo Analysis in the Effective Subsamples.** We simulate 5,000 voting paths from 1969 to 2019. The New York district president always votes. For each voting year in each simulation, 4 additional voting district presidents are randomly selected from the remaining 11 districts. **Plot (a)**: In each simulation, we calculate the average voting and non-voting inflation series and recompute the coefficient and t-statistics of the voting-group and non-voting-group inflation, as in Table 3's Panel A, Column (3), using the inflation effective subsample. Note that the high and low dispersion groups are fixed, as dispersion is a function of inflation spread. The histogram shows the distribution of the t-statistics of the voting inflation. The red bar corresponds to the results from the actual voting scheme (Table 3, Panel A, Column (3)). **Plot (b)** conducts the same analysis using the UR, with the benchmark taken from Table 3, Panel B, Column (3). The probability of obtaining voting inflation t-statistics as extreme as the actual t-statistic is 3.00% in (a) and 3.62% in (b); both values are reported in the last rows of Table 3.



(a) Inflation



(b) Unemployment Rate

Figure 6: **Extreme Counterfactuals in Local Macro Variables.** Each plot demonstrates the economic magnitude of two extreme counterfactual cases of inflation or unemployment rates. **Plot (a):** In the Min(4) (Max(4)) case, we assume that votes are allocated to the four out of 11 districts (without New York) with the lowest (highest) inflation rates in the preceding month. The plot shows how many standard deviations (SD) away the counterfactual group's average inflation rates are from the actual voting group's average inflation rates. That is, we calculate the counterfactual group's average inflation rates minus the actual voting group's average inflation rates, and then divide the difference by the sample volatility of the actual voting-group inflation rates. For demonstration purposes, we plot the yearly average in the markers. **Plot (b)** conducts the parallel analysis using UR.

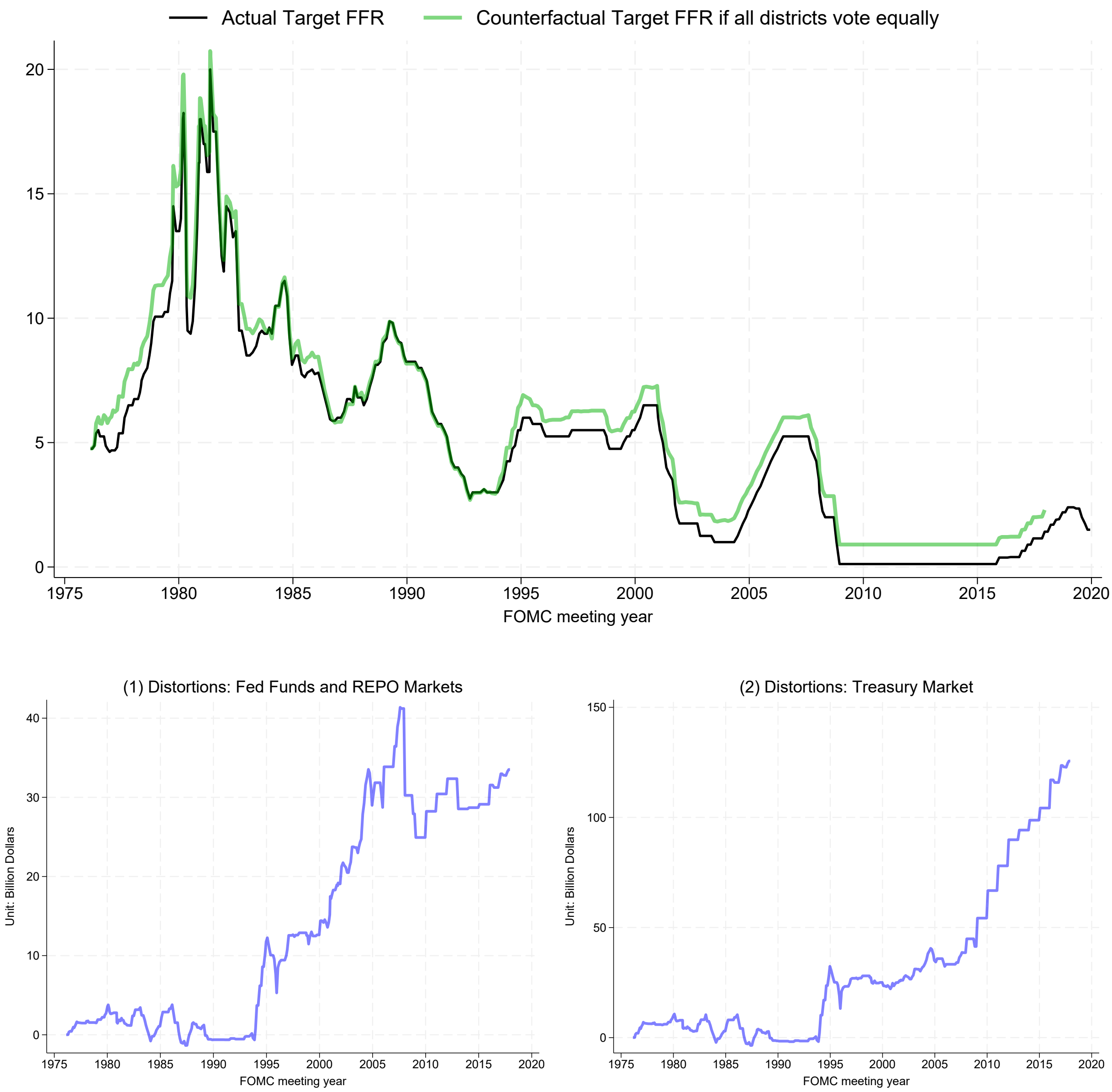


Figure 7: **A Reduced-Form Counterfactual Analysis Assuming Equal Voting Rights Among the 12 Districts.** The top figure displays the actual FFR series (solid thin black line) and a counterfactual target rate series (solid green line) if all twelve districts vote *equally* at each meeting, expressed in annual percent. The counterfactual target rate series is constructed as follows:
(1) In the inflation placebo subsample, $\Delta\overline{FFR}_m$ is equal to the actual ΔFFR_m.
(2) In the inflation effective subsample, we use the coefficient estimates and replace the actual voting-group inflation rates with a 12-district average inflation rate to compute a $\Delta\overline{FFR}_m$ iteratively. Specifically, we start the iteration with the actual first three FFRs as $\overline{FFR}_1$, $\overline{FFR}_2$, and $\overline{FFR}_3$, respectively. At $m = 4$, if it is in our effective subsample, $\Delta\overline{FFR}_4$ has three components: the counterfactual voting-inflation average, the counterfactual non-voting-inflation average (which is zero), lagged $\overline{FFR}_1$, $\overline{FFR}_2$, and $\overline{FFR}_3$, the Greenbook part (fixed), and the residual unexplained by the model (fixed). The intuition is not to cumulate model errors from the residuals, but to cumulate the effects of changing the voting scheme. The rest of the counterfactual series $\overline{FFR}_m$ based on the inflation model is done iteratively, or call it $\overline{FFR}_m^{Infl}$.
(3) We repeat the same process in steps (1) and (2) using the UR model, and obtain another counterfactual series $\overline{FFR}_m^{UR}$.
(4) The final total $\overline{FFR}_m$ equals $\overline{FFR}_m^{Infl} + \overline{FFR}_m^{UR} - FFR_m$.
The bottom figure multiplies this distortion rate ($\overline{FFR}_m$-FFR_m) with annual snapshots of the sizes of several markets that are highly responsive to changes in the FFR: (1) Item "Federal Funds and Security Repurchase Agreements" under the Financial Accounts of the United States – Z.1 Report (source: https://www.federalreserve.gov/releases/z1/, or https://fred.stlouisfed.org/release/tables?eid=807787&rid=52); (2) Treasury debt (source: https://www.dallasfed.org/research/econdata/govdebt).

Table 1: **Motivational evidence using textual analysis: President voting matters at FOMC meetings.** Panel A presents the results of a regression of the number of district mentions in a meeting on whether the district has a vote ("$Vote^i_m$"). The sample period is from 4/20/1976 to 12/13/2017, a total of 365 meetings, due to the transcript data limitation at the time of research. For each meeting, there are 12 data points representing the 12 districts, bringing the total N to 4,380 (365×12). We construct seven subsamples of words 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. In Panel B, $TextualSimilarity^i_m$ is the cosine similarity score calculated between speech blocks from all governors in the meeting and those from district i's president during meeting m. $SentimentCat^i_m$ is a categorical variable that equals 1 if governor sentiment towards district i is positive, -1 if negative, and 0 otherwise; $Sentiment^i_m$ gives the exact numerical sentiment value. More specifically, governor sentiment towards district i is the text sentiment of all speech blocks that mention this district. Relevant summary statistics are shown in Appendix Table A1. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Panel A: Are voting districts more frequently mentioned in the meeting?

Dependent variable:	$DistrictMentions^i_m$						
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)
$Vote^i_m$	0.7660***	0.3692***	0.1515***	0.2177***	0.3968***	1.9702***	-1.5733***
	(0.128)	(0.049)	(0.032)	(0.031)	(0.107)	(0.074)	(0.076)
Constant	3.4948***	0.5745***	0.2840***	0.2905***	2.9203***	0.4448***	2.4755***
	(0.075)	(0.024)	(0.017)	(0.015)	(0.067)	(0.026)	(0.060)
N	4,380	4,380	4,380	4,380	4,380	4,380	4,380
R^2	0.22	0.15	0.13	0.16	0.26	0.31	0.26
Meeting FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Governor attitude toward voting districts.

Dependent variable:	$TextSimilarity^i_m$	$SentimentCat^i_m$	$Sentiment^i_m$
	(1)	(2)	(3)
$Vote^i_m$	0.0918***	0.0723***	0.0075***
	(0.011)	(0.014)	(0.002)
Constant	0.1830***	0.2389***	0.0282***
	(0.006)	(0.009)	(0.002)
N	4,380	4,380	4,380
R^2	0.16	0.16	0.13
Meeting FE	Yes	Yes	Yes

Table 2: **Exogenous voting scheme.** Panel A reports the 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 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 1969-2019 sample in Column (1) has N=5,664 (472×12). In Column (2), we drop New York from each meeting, and therefore the numbers of observations are multiples of 11 instead of 12. The last row reports the number of mismatches between actual voting and federal-law-determined voting, divided by the total number of meeting-districts. Panel B reports the results of 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. We consider both last Q4's local economic conditions and last year's average local economic conditions. The unit of observation is district-year, and therefore, N=612, 51 years (1969-2019) × 12 districts. Unemployment data is available until 1976. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Panel A: By-law voting scheme

Dependent variable:	Voting Indicator^i_m	
	(1)	(2)
$ByLawVote^i_m$	0.9278***	0.9147***
	(0.005)	(0.006)
Constant	0.0179***	0.0179***
	(0.002)	(0.002)
N	5664	5192
R^2	0.87	0.85
F-statistic	32,380.6	22,285.3
Drop NY District:		X
% Mismatches with 1942 and alternate member schemes	1.0%	1.1%

Panel B: Past economic conditions

Dependent variable:	Voting Indicator$^i_{year}$					
	(1)	(2)	(3)	(4)	(5)	(6)
Last Q4 inflation	0.0127				0.0100	
	(0.018)				(0.021)	
Last year inflation		0.0105				0.0123
		(0.007)				(0.008)
Last Q4 UR			0.0114		0.0116	
			(0.012)		(0.012)	
Last year UR				0.0111		0.0084
				(0.013)		(0.013)
Constant	0.4644***	0.4302***	0.3869***	0.3881***	0.3838***	0.3649***
	(0.021)	(0.031)	(0.078)	(0.079)	(0.078)	(0.080)
N	612	612	516	516	516	516
R^2	0.00079	0.0042	0.0016	0.0015	0.0021	0.0068

Table 3: **Main results: Predicting changes in Federal funds rates.** This table estimates a variant of a state-of-the-art Taylor rule specification augmented by our voting and non-voting district macro variables as described in Section 5.2. Given that Greenbook numbers are released to the public with a 5-year delay, our main sample period for this analysis is from 1969 to 2017 (N=456 meetings); unemployment rate data is available from 1976. We follow Coibion and Gorodnichenko (2012) and use $E_m(Infl_{q1})$ (the one-quarter-ahead forecast of GDP deflator inflation), $E_m(UNEMP_{q1})$ (the one-quarter-ahead forecast of the unemployment rate), and $E_m(gGDP_{q0})$ (the current-quarter nowcast of real GDP growth). The unit of observation is one FOMC meeting. Columns (2)-(4) in Panel A (B) focus on the inflation (UR) effective subsample (i.e., meetings where the FFR could move in both directions, and where all voting presidents reached consensus, despite high inflation (UR) dispersion). Columns (5)-(7) in Panel A (B) focus on the inflation (UR) placebo subsample. ΔFFR_m denotes changes in the FFR from meeting $m-1$ to meeting m; $Infl^{Vote}_{m,t-1}$, $Infl^{NoVote}_{m,t-1}$, and $Infl^{US}_{m,t-1}$ denote the voting-group average, the non-voting-group average, and the U.S. (average of the 12 districts) inflation. $UR^{Vote}_{m,t-1}$, $UR^{NoVote}_{m,t-1}$, and $UR^{US}_{m,t-1}$ denote the voting-group average, the non-voting-group average, and the U.S. (average of the 12 districts) UR. In the last row of Panel A (B), we use 5000 simulations and calculate the probability of a random voting rotation to generate a statistical significance for the $Infl^{Vote}_{m,t-1}$ ($UR^{Vote}_{m,t-1}$) variable that is as extreme as that generated from an actual voting rotation (see details in Figure 5). Relevant summary statistics are shown in Appendix Table A2. We follow Cieslak and Vissing-Jorgensen (2021) and use robust standard errors, which are reported in parentheses. Appendix Table IB.1 expands Column (1) by including one Greenbook control one at a time. ***, p-value <1%; **, <5%; *, <10%.

Panel A. Local Inflation

Dependent variable:	ΔFFR_m						
Sample:	Full	Inflation effective subsample			Inflation placebo subsample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Infl^{Vote}_{m,t-1}$			0.4773**	0.5913*		0.0406	0.0845
			(0.206)	(0.301)		(0.399)	(0.756)
$Infl^{NoVote}_{m,t-1}$			-0.1287			0.0238	
			(0.191)			(0.466)	
$Infl^{US}_{m,t-1}$				-0.2452			-0.0289
				(0.315)			(0.829)
$E_m(Infl_{q1})$	0.0951***	0.0922*	0.0636	0.0638	0.1110***	0.1056***	0.1067***
	(0.026)	(0.055)	(0.048)	(0.048)	(0.031)	(0.035)	(0.035)
$E_m(UNEMP_{q1})$	-0.0467**	0.0024	0.0148	0.0147	-0.0594**	-0.0578**	-0.0580**
	(0.023)	(0.046)	(0.047)	(0.047)	(0.027)	(0.027)	(0.027)
$E_m(gGDP_{q0})$	0.0401**	0.0315	0.0267	0.0266	0.0393**	0.0391**	0.0392**
	(0.016)	(0.048)	(0.048)	(0.048)	(0.017)	(0.017)	(0.017)
FFR_{m-1}	0.1442	-0.0061	-0.0263	-0.0267	0.1459	0.1438	0.1427
	(0.118)	(0.288)	(0.282)	(0.281)	(0.124)	(0.120)	(0.120)
FFR_{m-2}	-0.1873	-0.1730	-0.1563	-0.1558	-0.1811	-0.1804	-0.1789
	(0.184)	(0.432)	(0.422)	(0.422)	(0.193)	(0.191)	(0.190)
FFR_{m-3}	-0.0136	0.1731	0.1757	0.1756	-0.0361	-0.0354	-0.0359
	(0.117)	(0.248)	(0.243)	(0.243)	(0.127)	(0.128)	(0.128)
Constant	0.1583	-0.2578	-0.3082	-0.3071	0.2388	0.2293	0.2295
	(0.164)	(0.234)	(0.237)	(0.237)	(0.195)	(0.197)	(0.197)
N	453	128	128	128	325	325	325
R^2	0.15	0.12	0.16	0.16	0.19	0.19	0.19
% Random t-stat $\geq$ actual t-stat			3.00%			50.92%	

Table 3 cont.

Panel B. Local Unemployment Rate

Dependent variable:	ΔFFR_m						
Sample:	Full	UR effective subsample			UR placebo subsample		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$UR^{Vote}_{m,t-1}$			-0.4483*	-0.5431*		0.0680	0.0735
			(0.260)	(0.321)		(0.087)	(0.085)
$UR^{NoVote}_{m,t-1}$			0.1415			-0.0010	
			(0.376)			(0.053)	
$UR^{US}_{m,t-1}$				0.2311			-0.0199
				(0.629)			(0.091)
$E_m(Infl_{q1})$	0.0951***	0.1206***	0.1541**	0.1533**	0.0691***	0.0858***	0.0853***
	(0.026)	(0.046)	(0.074)	(0.072)	(0.025)	(0.027)	(0.028)
$E_m(UNEMP_{q1})$	-0.0467**	-0.1317**	0.1109	0.1153	-0.0011	-0.0667	-0.0545
	(0.023)	(0.064)	(0.519)	(0.521)	(0.018)	(0.104)	(0.099)
$E_m(gGDP_{q0})$	0.0401**	0.0473	0.0774	0.0782	0.0317**	0.0343*	0.0352*
	(0.016)	(0.030)	(0.069)	(0.068)	(0.015)	(0.020)	(0.020)
FFR_{m-1}	0.1442	-0.0792	-0.2069	-0.2080	0.4007**	0.3685**	0.3685**
	(0.118)	(0.119)	(0.133)	(0.133)	(0.167)	(0.177)	(0.177)
FFR_{m-2}	-0.1873	-0.0187	0.0258	0.0264	-0.3893	-0.3765	-0.3767
	(0.184)	(0.191)	(0.201)	(0.201)	(0.287)	(0.305)	(0.305)
FFR_{m-3}	-0.0136	0.0359	0.0982	0.0991	-0.0398	-0.0250	-0.0246
	(0.117)	(0.172)	(0.195)	(0.195)	(0.139)	(0.154)	(0.154)
Constant	0.1583	0.6270	1.0419*	1.0431*	-0.1320	-0.1539	-0.1526
	(0.164)	(0.398)	(0.605)	(0.607)	(0.124)	(0.112)	(0.112)
N	453	171	111	111	282	256	256
R^2	0.15	0.10	0.13	0.13	0.46	0.50	0.50
% Random t-stat $\geq$ actual t-stat			3.62%			46.82%	

Table 4: **Timing of inflation data.** This table shows robustness tests for our main inflation measures in which we replicate the specification in Column (3) of Table 3. Column (1) repeats Column (3) of Table 3; our main measure uses the preceding month's inflation as much as possible, and in bimonthly and trimonthly cases tolerates current information but does not tolerate future information. Column (2) uses the "naïve" measure, which in bimonthly and trimonthly cases tolerates both current and future information. Column (3) builds on our main measure but tolerates current information if the meeting day is on or after the 15th of the month (and otherwise uses the last available monthly inflation values). Column (4) incorporates strictly past information. Other table details are presented in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m			
Inflation measure:	*Baseline*	*Naïve Measure*	*Some Past Information*	*Strictly Past Information*
	(1)	(2)	(3)	(4)
$Infl^{Vote}_{m,t-1}$	0.4773**	0.4913**	0.4716**	0.4383**
	(0.206)	(0.209)	(0.212)	(0.207)
$Infl^{NoVote}_{m,t-1}$	-0.1287	-0.1385	-0.0189	0.1000
	(0.191)	(0.197)	(0.193)	(0.222)
$E_m(Infl_{q1})$	0.0636	0.0724	0.0687	0.0667
	(0.048)	(0.048)	(0.047)	(0.044)
$E_m(UNEMP_{q1})$	0.0148	0.0153	0.0111	0.0074
	(0.047)	(0.047)	(0.045)	(0.042)
$E_m(gGDP_{q0})$	0.0267	0.0332	0.0293	0.0096
	(0.048)	(0.049)	(0.051)	(0.051)
FFR_{m-1}	-0.0263	-0.0645	-0.0520	-0.0937
	(0.282)	(0.257)	(0.272)	(0.261)
FFR_{m-2}	-0.1563	-0.1319	-0.1713	-0.1144
	(0.422)	(0.390)	(0.396)	(0.354)
FFR_{m-3}	0.1757	0.1857	0.2050	0.1832
	(0.243)	(0.242)	(0.233)	(0.200)
Constant	-0.3082	-0.3308	-0.2739	-0.1834
	(0.237)	(0.234)	(0.222)	(0.195)
N	128	128	128	128
R^2	0.16	0.17	0.17	0.17
% Random t-stat $\geq$ actual t-stat	3.00%	3.16%	3.46%	5.95%

Table 5: **Proxy for district power.** Through the lens of our main specification, this table proposes a proxy for the relative power of each of the 12 districts by macro variable. Specifically, we drop the entire history of one district (at a time), reproduce the voting and non-voting macro series, and re-estimate Column (3) of Table 3 given respective effective subsamples. Panel A (B) presents the results of the inflation rate (UR) result. Other table details are presented in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m											
	Boston	New York	Philadelphia	Cleveland	Richmond	Atlanta	Chicago	St Louis	Minneapolis	Kansas City	Dallas	San Francisco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. Inflation												
$Infl^{Vote}_{m,t-1}$	0.4537**	0.4152**	0.4922**	0.4640**	0.4335*	0.4795**	0.1685	0.5321**	0.3676	0.5288**	0.5239***	0.3934**
	(0.210)	(0.170)	(0.191)	(0.184)	(0.241)	(0.236)	(0.203)	(0.206)	(0.253)	(0.207)	(0.192)	(0.178)
$Infl^{NoVote}_{m,t-1}$	-0.1136	-0.0775	-0.1337	-0.1222	-0.0716	-0.1106	0.1787	-0.1991	-0.0569	-0.1886	-0.1892	-0.0715
	(0.241)	(0.177)	(0.174)	(0.167)	(0.198)	(0.200)	(0.204)	(0.185)	(0.238)	(0.186)	(0.175)	(0.167)
$E_m(Infl_{q1})$	0.0621	0.0643	0.0588	0.0652	0.0620	0.0628	0.0634	0.0651	0.0666	0.0660	0.0676	0.0651
	(0.049)	(0.049)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.049)	(0.048)	(0.047)	(0.049)	(0.049)
$E_m(UNEMP_{q1})$	0.0117	0.0157	0.0168	0.0158	0.0154	0.0153	0.0161	0.0152	0.0148	0.0135	0.0131	0.0143
	(0.048)	(0.047)	(0.047)	(0.047)	(0.048)	(0.047)	(0.048)	(0.047)	(0.046)	(0.046)	(0.047)	(0.047)
$E_m(gGDP_{q0})$	0.0238	0.0270	0.0287	0.0265	0.0271	0.0263	0.0279	0.0271	0.0266	0.0266	0.0274	0.0272
	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)	(0.048)
FFR_{m-1}	-0.0299	-0.0248	-0.0154	-0.0288	-0.0306	-0.0200	-0.0226	-0.0218	-0.0240	-0.0328	-0.0321	-0.0248
	(0.282)	(0.279)	(0.278)	(0.283)	(0.284)	(0.280)	(0.289)	(0.280)	(0.286)	(0.280)	(0.280)	(0.284)
FFR_{m-2}	-0.1583	-0.1580	-0.1713	-0.1516	-0.1545	-0.1695	-0.1543	-0.1638	-0.1622	-0.1477	-0.1396	-0.1536
	(0.420)	(0.419)	(0.416)	(0.422)	(0.425)	(0.419)	(0.432)	(0.420)	(0.430)	(0.420)	(0.420)	(0.426)
FFR_{m-3}	0.1824	0.1753	0.1821	0.1733	0.1777	0.1818	0.1692	0.1784	0.1797	0.1726	0.1627	0.1723
	(0.240)	(0.242)	(0.241)	(0.241)	(0.244)	(0.242)	(0.246)	(0.242)	(0.248)	(0.242)	(0.243)	(0.245)
Constant	-0.2786	-0.3108	-0.3272	-0.3129	-0.3112	-0.3097	-0.3236	-0.3112	-0.3109	-0.2997	-0.2975	-0.3089
	(0.240)	(0.236)	(0.234)	(0.234)	(0.239)	(0.238)	(0.238)	(0.237)	(0.233)	(0.232)	(0.235)	(0.236)
N	128	128	128	128	128	128	128	128	128	128	128	128
R^2	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.16	0.17	0.15

Dependent variable:	ΔFFR_m											
	Boston	New York	Philadelphia	Cleveland	Richmond	Atlanta	Chicago	St Louis	Minneapolis	Kansas City	Dallas	San Francisco
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel B. UR												
$UR^{Vote}_{m,t-1}$	-0.3040	-0.0971	-0.4349	-0.4983**	-0.3201	-0.4364*	-0.4701*	-0.4750*	-0.4007	-0.4927*	-0.2959	-0.4802*
	(0.248)	(0.191)	(0.278)	(0.231)	(0.209)	(0.261)	(0.277)	(0.255)	(0.262)	(0.282)	(0.202)	(0.271)
$UR^{NoVote}_{m,t-1}$	0.3115	0.2307	0.0790	-0.0928	0.0706	0.1330	-0.0668	0.0093	0.0924	0.1111	0.0754	0.3714
	(0.255)	(0.372)	(0.330)	(0.390)	(0.355)	(0.413)	(0.366)	(0.373)	(0.357)	(0.385)	(0.372)	(0.354)
$E_m(Infl_{q1})$	0.1837**	0.1557**	0.1468*	0.1444**	0.1519*	0.1558**	0.1504**	0.1470**	0.1452**	0.1631**	0.1500**	0.1844**
	(0.078)	(0.073)	(0.075)	(0.066)	(0.077)	(0.075)	(0.072)	(0.070)	(0.071)	(0.069)	(0.067)	(0.077)
$E_m(UNEMP_{q1})$	-0.1451	-0.2980	0.1686	0.3662	0.0630	0.1154	0.2784	0.2464	0.0991	0.1953	0.0246	-0.0802
	(0.412)	(0.445)	(0.494)	(0.532)	(0.511)	(0.590)	(0.510)	(0.520)	(0.548)	(0.545)	(0.494)	(0.451)
$E_m(gGDP_{q0})$	0.0465	0.0293	0.0789	0.1085	0.0718	0.0788	0.1050	0.0937	0.0774	0.1007	0.0765	0.0513
	(0.056)	(0.061)	(0.064)	(0.076)	(0.068)	(0.070)	(0.071)	(0.071)	(0.073)	(0.077)	(0.075)	(0.061)
FFR_{m-1}	-0.1949	-0.1707	-0.1966	-0.2134*	-0.1959	-0.2084	-0.2141	-0.2157	-0.2113*	-0.1988	-0.2045	-0.2183
	(0.135)	(0.131)	(0.138)	(0.126)	(0.132)	(0.132)	(0.139)	(0.131)	(0.125)	(0.137)	(0.129)	(0.132)
FFR_{m-2}	0.0166	0.0157	0.0276	0.0273	0.0245	0.0271	0.0298	0.0281	0.0304	0.0287	0.0309	0.0248
	(0.201)	(0.204)	(0.205)	(0.195)	(0.202)	(0.201)	(0.204)	(0.199)	(0.199)	(0.204)	(0.200)	(0.200)
FFR_{m-3}	0.0793	0.0786	0.0831	0.0943	0.0894	0.0973	0.0992	0.1054	0.1049	0.0860	0.1064	0.0935
	(0.202)	(0.201)	(0.194)	(0.191)	(0.196)	(0.195)	(0.193)	(0.193)	(0.192)	(0.188)	(0.193)	(0.200)
Constant	0.8006	0.9874	1.0041*	1.1359*	1.0119*	0.9870	1.3044**	1.1247*	1.1512*	0.8870	0.9445	1.1525*
	(0.570)	(0.634)	(0.569)	(0.618)	(0.602)	(0.613)	(0.625)	(0.632)	(0.656)	(0.620)	(0.758)	(0.636)
N	111	111	111	111	111	111	111	111	111	111	111	111
R^2	0.13	0.11	0.13	0.14	0.13	0.14	0.14	0.14	0.13	0.13	0.12	0.14

Table 6: **Futures market expectations.** This table presents the regression results of predicting changes in investor expectations using recent inflation in the U.S., voting districts, and non-voting districts. The table reports results using the inflation effective subsample. The first dependent variable, Δf_m, measures the change in the average implied Federal funds futures rate across various terms (source: Refinitiv DataStream) from the day after the previous meeting $m-1$ to the last day of the current meeting m. The second and third dependent variables decompose Δf_m into two segments: "Between meetings," defined as the change in FFF from the day after the previous meeting $m-1$ to the day before the current meeting m, and "During meetings," defined as the change in FFF from the day before to the last day of the current meeting m. We use the largest sample available through the end of the paper's sample period, 1989–2019. This data limitation prevents us from conducting a similar analysis using unemployment rates, which would have yielded only 25 data points. Additional data details are provided in Internet Appendix IA.4, and relevant summary statistics are reported in Appendix Table A3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	Changes in average FFF rates Δf_m			Between meetings			During meetings		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Infl^{Vote}_{m,t-1}$		0.6911***	0.7889**		0.6487**	0.7559**		0.0423	0.0329
		(0.261)	(0.338)		(0.257)	(0.319)		(0.081)	(0.119)
$Infl^{NoVote}_{m,t-1}$		-0.2497			-0.2619			0.0122	
		(0.180)			(0.170)			(0.063)	
$Infl^{US}_{m,t-1}$	0.3992**		-0.3395	0.3467*		-0.3611	0.0525		0.0216
	(0.174)		(0.298)	(0.176)		(0.276)	(0.048)		(0.109)
FFR_{m-1}	-0.0057	-0.0063	-0.0066	-0.0038	-0.0044	-0.0047	-0.0019	-0.0019	-0.0019
	(0.022)	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)	(0.004)	(0.005)	(0.005)
Constant	-0.0401	-0.0326	-0.0342	-0.0274	-0.0202	-0.0217	-0.0127	-0.0124	-0.0125
	(0.099)	(0.095)	(0.096)	(0.099)	(0.094)	(0.095)	(0.018)	(0.018)	(0.018)
N	96	96	96	96	96	96	96	96	96
R^2	0.063	0.10	0.100	0.052	0.093	0.089	0.016	0.017	0.017

Table 7: **Treasury yields.** This table presents the regression results of predicting changes in market yields for Treasury bonds using recent macro variables for the U.S., voting districts, and non-voting districts, one maturity at a time. The first (last) two panels report the results for the inflation rate (UR) using the inflation (UR) effective subsample. Week 0 denotes the week of the FOMC meeting; $\Delta yield_{(-4,h)}$ denotes the yield difference from 4 weeks prior to the meeting to h week, where yield (and hence the level difference) is in units of percent per annum. The unit of observation is one FOMC meeting. For each term-h, we run the specification as displayed in Equation (3) with $\Delta yield_{(-4,h)}$ as the dependent variable of interest. To conserve space, we report only the coefficient of voting-group macro variables and selected maturities (short term is 3 month and long term is 5 year). Panels A and C control for non-voting measures, and Panels B and D control for U.S. measures. Relevant summary statistics are shown in Appendix Table A3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:			$\Delta yield_{(-4,h)}$		
Horizon in weeks (-4,h)	(-4,-2)	(-4,-1)	(-4,0)	(-4,+1)	(-4,+2)
	(1)	(2)	(3)	(4)	(5)
Panel A. Inflation; Controlling with non-voting measures					
$Infl^{Vote}_{m,t-1}$, 3m	0.1194	0.2384*	0.4094**	0.2892	0.4170*
	(0.098)	(0.125)	(0.160)	(0.175)	(0.214)
$Infl^{Vote}_{m,t-1}$, 5yr	0.0361	0.2012	0.3463	0.4058*	0.3537
	(0.143)	(0.159)	(0.211)	(0.230)	(0.235)
Panel B. Inflation Controlling with US measures					
$Infl^{Vote}_{m,t-1}$, 3m	0.1413	0.2454	0.4286*	0.2831	0.4234
	(0.162)	(0.213)	(0.257)	(0.299)	(0.335)
$Infl^{Vote}_{m,t-1}$, 5yr	0.0018	0.2511	0.4354	0.4926	0.2934
	(0.227)	(0.255)	(0.351)	(0.378)	(0.376)
Panel C. UR; Controlling with non-voting measures					
$UR^{Vote}_{m,t-1}$, 3m	0.0492	-0.0789	-0.2730	-0.2392	-0.1869
	(0.066)	(0.125)	(0.300)	(0.210)	(0.200)
$UR^{Vote}_{m,t-1}$, 5yr	0.0102	-0.0228	-0.0682	0.0303	0.0433
	(0.048)	(0.064)	(0.100)	(0.108)	(0.136)
Panel D. UR; Controlling with US measures					
$UR^{Vote}_{m,t-1}$, 3m	0.0486	-0.1866	-0.4778	-0.4406	-0.3413
	(0.108)	(0.200)	(0.467)	(0.330)	(0.322)
$UR^{Vote}_{m,t-1}$, 5yr	-0.0046	-0.0634	-0.1133	0.0309	0.0759
	(0.075)	(0.098)	(0.152)	(0.173)	(0.228)

Appendix

Table A1: **Summary statistics for panel variables.** This table presents the summary statistics for the panel variables used in the paper. $DistrictMentions^i_m$ denotes the word counts of district i's keywords (geographical features, federal agencies, banks, local businesses, universities, newspapers) during meeting m. We identify mentions based on words spoken by governors or district presidents. Then we construct three variables that capture governors' attitudes towards a district president. $TextualSimilarity^i_m$ is the cosine similarity score calculated between speech blocks from all governors and those from district i's president during meeting m. $SentimentCat^i_m$ is a categorical variable that equals 1 if governor sentiment towards district i is positive, -1 if negative, and 0 otherwise; $Sentiment^i_m$ gives the exact numerical sentiment value. More specifically, governor sentiment towards district i is the text sentiment of all speech blocks that mention this district. $Vote^i_m$ equals one if district i has voting rights during meeting m. $Dissent^i_m$ equals one if voting participant i dissented in meeting m; $DissentTighter^i_m$ ($DissentEasier^i_m$) equals one if voting participant i dissented for a tighter (an easier) policy in meeting m.

Variable	Mean	SD	Min	Max	5th	25th	50th	75th	95th
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$DistrictMentions^i_m$, Governors and Presidents	3.81	4.41	0	40	0	1	2	5	13
$DistrictMentions^i_m$, Governors	0.73	1.56	0	23	0	0	0	1	4
$DistrictMentions^i_m$, Governors-Chair	0.35	1.03	0	18	0	0	0	0	2
$DistrictMentions^i_m$, Governors-Non-Chair	0.38	0.99	0	16	0	0	0	0	2
$DistrictMentions^i_m$, Presidents	3.09	3.85	0	35	0	0	2	4	10
$DistrictMentions^i_m$, Voting Presidents	1.26	2.48	0	30	0	0	0	1	6
$DistrictMentions^i_m$, Non-voting Presidents	1.82	2.95	-7	30	0	0	1	2	8
$TextualSimilarity^i_m$	0.22	0.36	0.00	0.96	0.00	0.00	0.00	0.52	0.90
$SentimentCat^i_m$	0.27	0.48	-1	1	0	0	0	1	1
$Sentiment^i_m$	0.03	0.08	-1.00	0.70	0.00	0.00	0.00	0.05	0.15
$Vote^i_m$	0.42	0.49	0	1	0	0	0	1	1
$Dissenters^i_m$	0.09	0.28	0	1	0	0	0	0	1
$DissentersTighter^i_m$	0.06	0.24	0	1	0	0	0	0	1
$DissentersEasier^i_m$	0.01	0.11	0	1	0	0	0	0	0

Table A2: **Summary statistics of variables used in the main meeting-level specification.** This table presents the summary statistics for the meeting-level variables used for Table 3 and Table 4. As in the paper, each meeting has time stamp m and ΔFFR_m denotes the change in the Federal funds target rate from the last meeting $(m-1)$ to this meeting (m). The unit for ΔFFR_m is percent per annum. $Infl^{US}_{m,t-1}$ denotes the prior month's U.S. inflation rate. $Infl^{Vote}_{m,t-1}$ ($Infl^{NoVote}_{m,t-1}$) denotes the prior month's voting-district (non-voting-district) inflation rates during meeting m. Units for all inflation measures are in monthly percent. Similar notation meanings apply to $Infl^{US}_{m,t-1}$, $Infl^{Vote}_{m,t-1}$ and $Infl^{NoVote}_{m,t-1}$. Section 3 and Tables 3 and 4 provide more details about the data and constructions of variables and subsamples presented here.

Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel A: *Full sample (N=472)*									
ΔFFR_m	-0.01	0.64	-4.00	4.12	-0.75	-0.12	0.00	0.19	0.69
$Infl^{US}_{m,t-1}$	0.35	0.35	-1.55	1.42	-0.16	0.13	0.34	0.53	0.97
$Infl^{Vote}_{m,t-1}$	0.35	0.36	-1.55	1.51	-0.17	0.14	0.32	0.53	0.99
$Infl^{NoVote}_{m,t-1}$	0.35	0.35	-1.55	1.52	-0.17	0.14	0.34	0.55	0.95
$UR^{US}_{m,t-1}$	6.02	1.48	3.50	10.29	3.83	4.95	5.73	7.08	8.88
$UR^{Vote}_{m,t-1}$	6.12	1.56	3.27	10.97	4.05	4.96	5.87	7.17	9.07
$UR^{NoVote}_{m,t-1}$	5.95	1.47	3.55	10.57	3.77	4.85	5.65	6.95	8.87
Panel B: *Greenbook sample (N=456)*									
ΔFFR_m	-0.01	0.65	-4.00	4.12	-0.75	-0.12	0.00	0.19	0.69
$E_m(Infl_{q1})$	3.74	2.48	0.00	11.50	1.00	1.80	3.10	5.00	9.10
$E_m(UNEMP_{q1})$	6.30	1.55	3.50	11.10	4.10	5.10	6.00	7.20	9.50
$E_m(gGDP_{q0})$	2.35	2.76	-10.90	9.00	-3.00	1.40	2.50	3.70	6.60
$Infl^{US}_{m,t-1}$	0.36	0.35	-1.55	1.42	-0.15	0.14	0.34	0.54	0.97
$Infl^{Vote}_{m,t-1}$	0.36	0.36	-1.55	1.51	-0.17	0.15	0.32	0.55	1.01
$Infl^{NoVote}_{m,t-1}$	0.36	0.35	-1.55	1.52	-0.17	0.15	0.34	0.56	0.95
$UR^{US}_{m,t-1}$	6.12	1.43	3.79	10.29	4.07	5.09	5.81	7.10	8.88
$UR^{Vote}_{m,t-1}$	6.22	1.51	3.68	10.97	4.17	5.09	5.99	7.22	9.08
$UR^{NoVote}_{m,t-1}$	6.05	1.42	3.55	10.57	4.05	5.00	5.72	6.97	8.97
Panel C: *Greenbook × Inflation effective subsample in Table 3, Panel A (N=130)*									
ΔFFR_m	0.06	0.47	-1.00	3.00	-0.50	0.00	0.00	0.25	0.69
$E_m(Infl_{q1})$	2.88	1.95	0.10	10.70	0.90	1.60	2.40	3.40	6.90
$E_m(UNEMP_{q1})$	5.61	1.19	3.50	10.50	3.90	4.70	5.60	6.20	7.10
$E_m(gGDP_{q0})$	2.59	1.91	-4.00	7.20	-1.30	2.00	2.70	3.60	5.00
$Infl^{US}_{m,t-1}$	0.26	0.28	-0.57	1.27	-0.25	0.09	0.25	0.44	0.69
$Infl^{Vote}_{m,t-1}$	0.24	0.29	-0.48	1.20	-0.25	0.04	0.24	0.41	0.73
$Infl^{NoVote}_{m,t-1}$	0.27	0.29	-0.66	1.32	-0.22	0.11	0.27	0.46	0.69
Panel D: *Greenbook × Inflation placebo subsample in Table 3, Panel A (N=326)*									
ΔFFR_m	-0.04	0.71	-4.00	4.12	-0.88	-0.25	0.00	0.12	0.62
$E_m(Infl_{q1})$	4.08	2.59	0.00	11.50	1.10	2.00	3.50	5.70	9.70
$E_m(UNEMP_{q1})$	6.57	1.60	3.60	11.10	4.30	5.30	6.40	7.60	9.60
$E_m(gGDP_{q0})$	2.26	3.03	-10.90	9.00	-3.70	1.20	2.30	3.80	6.90
$Infl^{US}_{m,t-1}$	0.40	0.36	-1.55	1.42	-0.10	0.18	0.37	0.60	1.05
$Infl^{Vote}_{m,t-1}$	0.40	0.37	-1.55	1.51	-0.12	0.19	0.37	0.64	1.07
$Infl^{NoVote}_{m,t-1}$	0.40	0.37	-1.55	1.52	-0.11	0.16	0.37	0.59	1.03

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Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel E: *Greenbook × UR effective subsample in in Table 3, Panel B (N=111)*									
ΔFFR_m	0.03	0.89	-4.00	4.12	-1.00	-0.12	0.00	0.25	1.00
$E_m(Infl_{q1})$	5.14	2.33	1.50	11.00	2.30	3.40	4.50	6.40	10.00
$E_m(UNEMP_{q1})$	6.48	1.39	3.50	10.50	4.10	5.50	6.40	7.30	9.10
$E_m(gGDP_{q0})$	2.87	3.21	-10.50	8.20	-4.00	1.50	3.10	5.20	7.10
$UR^{US}_{m,t-1}$	6.62	1.05	4.43	10.23	5.26	5.73	6.74	7.18	8.78
$UR^{Vote}_{m,t-1}$	6.72	1.07	4.53	10.03	5.10	5.94	6.58	7.34	8.36
$UR^{NoVote}_{m,t-1}$	6.55	1.10	4.35	10.57	5.19	5.61	6.61	7.09	8.77
Panel F: *Greenbook × UR placebo subsample in in Table 3, Panel B (N=256)*									
ΔFFR_m	-0.04	0.45	-4.00	2.62	-0.50	-0.12	0.00	0.00	0.50
$E_m(Infl_{q1})$	2.88	2.16	0.00	11.50	0.80	1.50	2.10	3.60	7.40
$E_m(UNEMP_{q1})$	6.19	1.64	3.60	11.10	4.10	4.90	5.80	7.10	9.60
$E_m(gGDP_{q0})$	2.04	2.40	-10.90	9.00	-2.40	1.40	2.30	3.30	5.10
$UR^{US}_{m,t-1}$	5.91	1.52	3.79	10.29	3.99	4.72	5.50	6.98	9.08
$UR^{Vote}_{m,t-1}$	6.01	1.61	3.68	10.97	4.14	4.78	5.57	7.10	9.13
$UR^{NoVote}_{m,t-1}$	5.83	1.49	3.55	10.27	3.96	4.75	5.49	6.85	9.01
Panel G: *Inflation robustness variables in Table 4 (N=130)*									
Naïve measure	0.24	0.29	-0.48	1.20	-0.25	0.04	0.23	0.42	0.73
Some past information	0.25	0.27	-0.43	1.10	-0.20	0.04	0.24	0.42	0.70
Strictly past information	0.26	0.27	-0.53	1.10	-0.17	0.10	0.24	0.46	0.68

Table A3: **Summary statistics of variables used in other meeting-level specifications.** This table presents the summary statistics for other meeting-level dependent variables used for Tables 6 and 7. Δf_m is the change in the average implied rates from Federal funds futures contracts. Futures data is obtained from Refinitiv DataStream, which is available from 1989 on. The three Δf_m variables differ in the timelines; Δf_m calculates the change in futures rates from the day after the previous FOMC meeting to the last day of the present FOMC meeting; "between meeting" calculates the change in futures rates from the day after the previous FOMC meeting to the day before the present FOMC meeting; "during meeting" calculates the change in futures rates from the day before the present FOMC meeting to the last day of the present FOMC meeting. $\Delta yield_{(-4,h)}$ is the first difference between market Treasury yield rates by the ends of Week -4 (0=meeting week) and Week h. Treasury yield rates are obtained from FRED. Units of all variables are percent per annum.

Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Δf_m	0.01	0.36	-2.13	1.03	-0.42	-0.16	0.01	0.18	0.54
Δf_m between meeting	0.02	0.35	-2.18	0.99	-0.37	-0.12	0.01	0.17	0.52
Δf_m during meeting	-0.01	0.10	-0.62	0.16	-0.18	-0.03	0.00	0.03	0.10
$\Delta yield3m_{(-4,-2)}$	0.02	0.24	-1.02	1.20	-0.29	-0.06	0.01	0.08	0.41
$\Delta yield3m_{(-4,-1)}$	0.02	0.31	-0.98	2.09	-0.35	-0.08	0.02	0.11	0.40
$\Delta yield3m_{(-4,0)}$	-0.01	0.36	-1.24	1.54	-0.71	-0.08	0.03	0.11	0.42
$\Delta yield3m_{(-4,+1)}$	0.01	0.43	-1.22	3.09	-0.66	-0.07	0.03	0.16	0.45
$\Delta yield3m_{(-4,+2)}$	0.02	0.49	-1.24	3.52	-0.85	-0.10	0.02	0.17	0.46
$\Delta yield5yr_{(-4,-2)}$	0.01	0.25	-0.51	0.89	-0.39	-0.14	0.01	0.16	0.45
$\Delta yield5yr_{(-4,-1)}$	0.01	0.29	-0.72	0.88	-0.46	-0.15	0.00	0.14	0.53
$\Delta yield5yr_{(-4,0)}$	-0.01	0.33	-0.84	1.11	-0.52	-0.21	-0.02	0.18	0.52
$\Delta yield5yr_{(-4,+1)}$	0.01	0.35	-0.71	0.95	-0.48	-0.23	-0.06	0.22	0.75
$\Delta yield5yr_{(-4,+2)}$	-0.01	0.41	-0.97	1.12	-0.59	-0.25	-0.08	0.23	0.77

Internet Appendices for "When Do FOMC Voting Rights Affect Monetary Policy?"

IA. Data Appendix

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

IA.1. Local Economic Conditions

Inflation. We investigated Reserve Banks' websites and data archives, and found no readily-available inflation rate or CPI time-series data at the Federal Reserve District level that cover enough years for our research. Next we turned to the Bureau of Labor Statistics (BLS). The BLS reports metropolitan statistical area (MSA) CPI data for all urban consumers; much of this CPI data are available at a monthly or bimonthly frequency starting from as early as 1914. We could obtain state-level inflation data from Hazell, Herreño, Nakamura, and Steinsson (2022), which is available for 34 states from 1978 or 1989 to 2017, with the majority of states missing data for 1987 and 1988. However, district boundaries often do not fall along state lines, which could cause empirical challenges (when we differentiate districts from each other) given our research interest. Inflation dispersion among districts at (preferably) FOMC meeting frequency is the wedge we want to exploit in this research. In addition, from a practical perspective, we also prefer inflation measures that are publicly available and more easily accessible. As a result, MSA-based measures suit our criteria best. We are able to find at least one valid metropolitan statistical area CPI dataset that has a long sample for each district. We also prefer areas with as much monthly data as possible, given that the FOMC meets monthly or bimonthly.

Against this backdrop, Table IA.1 summarizes area and CPI data from BLS that are closely related to each Federal Reserve district and their respective time-series coverage in terms of longitude and frequency. We do not use series that are discontinued. It is also noteworthy that we are not the first group to use BLS MSA CPI-U data to proxy for local inflation in finance and economics literature (e.g., Reinsdorf (1994), Coen, Eisner, Marlin, and Shah (1999), Cortes (2008), Bils, Klenow, and Malin (2012), Vavra (2014), Diamond (2016), Stroebel and Vavra (2019), Mian, Sufi, and Verner (2020), among many others).

The frequency of CPI data availability for each district-time is often different. In addition, FOMC meetings do not occur on a calendar monthly or quarterly frequency. These add challenges to our next empirical objective, which is to identify the incremental local information that becomes available to or known by FOMC members (especially presidents) between two FOMC meetings. In our research, we conduct three economically-motivated steps, as also summarized in Section 3.1.2.

First, we convert each individual MSA-level CPI-U series into monthly frequency and unit. 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)), to be conservative, we do not fill or "invent" the missing months during these long gaps. Instead, we categorize these periods as missing because we cannot conjecture high-frequency dynamics in their macro fundamentals with confidence.

Second, we address the match with FOMC timing, which motivates some of our robustness tests. The rule of thumb is to incorporate information about the last month's inflation as much as possible and not to tolerate future information. Here is a case-by-case breakdown of our main measure:

- If there is a new CPI data point available at the end of the month prior to the month of FOMC meeting ($t-1$), then we use $Infl_{t-1}$. Note that this applies to monthly, bimonthly, or three-month frequency.

- In the other bimonthly case, if there is a new CPI data point available at a frequency of $\{t-2, t, t+2, \text{etc.}\}$, we use the monthly inflation rates calculated using CPI values of $t-2$ and t.

- In the remaining two three-monthly cases, if there is a new CPI data point available at a frequency of $\{t-3, t, t+3, \text{etc.}\}$, we use the monthly inflation rates calculated using CPI values of $t-3$ and t. If there is a new CPI data point available at a frequency of $\{t-2, t+1, t+4, \text{etc.}\}$, we use the monthly inflation rates calculated using CPI values of $t-5$ and $t-2$, as we do not tolerate future information.

Third and finally, we obtain MSA-level population data (source: the U.S. Census) and compute the population-weighted average as some districts have multiple MSAs. To validate the economic importance of this step, we compare the sum of the population from MSAs within a district with Federal District population data (source: FRED). As Table IA.1 shows, Boston, New York, Philadelphia, Cleveland, St Louis, Minneapolis, and Kansas City remain single-MSA districts given source data availability. Among the remaining five districts with multiple MSAs, Richmond District's population coverage increases from as high as 20% if using a main-MSA measure to 30% if using a population-weighted measure; Atlanta, 14% to 33%; Chicago, 28% to 44%; Dallas, 30% to 62%; San Francisco, 13% to 76%. This motivates the importance of using population-weighted inflation measures.

The timing matching results in three robustness measures that we test:

(1) The naïve measure.

(2) A measure that builds on our main measure but tolerates current information only if the meeting day is on or after the 15th of the month and otherwise uses

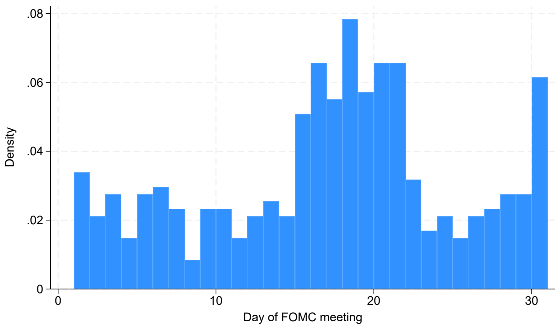

Figure IA.1: Histogram of day of the month of FOMC meetings from 1969-2019.

last available monthly inflation values. Our main measure chooses a parsimonious approach by tolerating current information because Figure IA.1 shows that most (68.4%) FOMC meetings take place during the second half of a month, and decisions made at these meetings are not likely to affect same-month inflation. This alternative measure would be more conservative in incorporating current information, hence an important alternative measure.

(3) A measure that incorporates strictly past information.

Table IA.1: **Availability of local CPI data for all urban consumers from the Bureau of Labor Statistics (BLS).**

District	Metropolitan Area Data (BLS)	Coverage	
01-Boston	Boston-Cambridge-Newton	1914-2019	1914-1940: Annual (irregular)
			1941-1952: Month
			1953-1977: Every three months
			1978-2019: Every two months
	Boston-Brockton-Nashua	2008-2012	Annual
02-New York	New York-Newark-Jersey City	1914-2019	1914-1940: Annual (irregular)
			1941-2019: Month
03-Philadelphia	Philadelphia-Camden-Wilmington	1914-2019	1914-1940: Annual (irregular)
			1941-1997: Month
			1998-2019: Every two months
04-Cleveland	Midwest Region	1966-2019	1966-1977: Every three months
			1978-1986: Every two months
			1987-2019: Month
	Cincinnati-Hamilton (discontinued)	1992-2017	Annual (irregular)
	Cleveland-Akron (discontinued)	1992-2017	Every two months
	Pittsburgh	1984-2017	1984-1997: Every two months
			1998-2019: Annual
05-Richmond	Washington-Arlington-Alexandria	1914-2019	1914-1940: Annual (irregular)
			1941-1947: Month
			1948-1977: Every three months
			1978-2019: Every two months
	Baltimore-Columbia-Towson	1914-2019	1914-1940: Annual (irregular)
			1941-1947: Month
			1948-1977: Every three months
			1978-2019: Every two months
06-Atlanta	Atlanta-Sandy Springs-Roswell	1917-2019	1917-1936: Annual (irregular)
			1937-1977: Every three months
			1978-1986: Every two months
			1987-1997: Annual
			1998-2019: Every two months
	Miami-Fort Lauderdale-West Palm Beach	1977-2019	Every two months
	Tampa-St. Petersburg-Clearwater	2017-2019	Every two months
07-Chicago	Chicago-Naperville-Elgin	1914-2019	1914-1940: Annual (irregular)
			1941-2019: Month
	Detroit-Warren-Dearborn	1914-2019	1914-1940: Annual (irregular)
			1941-1986: Month
			1987-2019: Every two months
	Milwaukee-Racine (discontinued)	1996-2017	Annual (irregular)

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District	Metropolitan Area Data (BLS)	Coverage	
08-St. Louis	St. Louis	1917-2019	1917-1934: Annual (irregular)
			1935-1940: Every three months
			1941-1947: Month
			1947-1977: Every three months
			1978-1997: Every two months
			1998-2017: Annual
			2018-2019: Every two months
09-Minneapolis	Minneapolis-St. Paul-Bloomington	1917-2019	1917-1934: Annual (irregular)
			1935-1940: Every three months
			1941-1947: Month
			1947-1977: Every three months
			1978-1986: Every two months
			1987-2017: Annual
			2018-2019: Every two months
10-Kansas City	Denver-Aurora-Lakewood	1964-2019	1964-1977: Every three months
			1978-1986: Every two months
			1987-2017: Annual
			2018-2019: Every two months
	Kansas City (discontinued)	2014-2017	Annual (irregular)
11-Dallas	Houston-The Woodlands-Sugar Land	1914-2019	1914-1940: Annual (irregular)
			1941-1952: Month
			1953-1977: Every three months
			1978-2019: Every two months
	Dallas-Fort Worth-Arlington	1963-2019	1963-1977: Every three months
			1978-2019: Every two months
12-San Francisco	San Francisco-Oakland-Hayward	1914-2019	1914-1940: Annual (irregular)
			1941-1947: Month
			1947-1977: Every three months
			1978-1986: Every two months
			1987-1997: Month
			1998-2019: Every two months
	Anchorage area	1960-2019	1960-1968: Annual (irregular)
			1969-1977: Every three months
			1978-1986: Every two months
			1987-2017: Annual
			2018-2019: Every two months
	Honolulu Area	1963-2019	1963-1977: Every three months
			1978-1986: Every two months
			1987-2017: Annual
			2018-2019: Every two months
	Los Angeles-Long Beach-Anaheim	1914-2019	1914-1940: Annual (irregular)
			1941-2019: Month
	Phoenix-Mesa-Scottsdale	1914-2019	1914-1940: Annual (irregular)
			1941-1997: Month
			1998-2019: Every two months
	Portland (discontinued)	2012-2017	Annual (irregular)
	Riverside-San Bernardino-Ontario	2017-2019	Every two months
	San Diego-Carlsbad	1965-2019	1965-1977: Every three months
			1978-1986: Every two months
			1987-2017: Annual
	Seattle-Tacoma-Bellevue	1914-2019	1914-1940: Annual (irregular)
			1941-1947: Month
			1948-1977: Every three months
			1978-1986: Every two months
			1987-1997: Annual
			1998-2019: Every two months

Unemployment rates Given the Fed's dual mandate, we also consider unemployment rates (UR). Our goal is to obtain the longest sample, we therefore use the balanced state-month UR data available starting in 1976 (source: BLS).

With UR, we face a different challenge than we did with inflation data. Raw data are at the state level, which leads to an overlapping concern, while in our research we are precisely interested in exploiting cross-district variation. Half of the states sit in multiple districts. Table IA.2 below shows the exact state composition in each district, with shaded districts being those that are in two districts.

Table IA.2: **State growth rates used to calculate district growth rates.**
Gray indicates a state that is covered 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

Therefore, in order to give our data a chance to generate cross-district variation, we first assign each state to a primary Fed district based on population coverage using the Federal Reserve shapefile. We then use state-year population data (source: FRED) to construct district-level population-weighted unemployment rates. For each meeting, we can compute the recent past month's voting-group, non-voting-group, and 12-district (i.e., the "U.S." variable in our paper) averages of unemployment rates.

Quarterly-available measures. In Internet Appendix Table IB.3, we demonstrate the importance of using high-frequency data in testing our hypothesis by collapsing our MSA-monthly-based inflation measure, which should effectively capture incremental information coming up between meetings, into quarterly inflation and then merging it back with FOMC meetings. There are typically two meetings within a calendar quarter, which could mix up the macro signals. Regardless, we are aware of these quarterly-available macro variables.

- The BEA produces MSA-level or state-level GDP data (`http://www.bea.gov/newsreleases/regional/gdp_state/qgsp_newsrelease.htm`); however, the earliest downloadable granular-level GDP data, both nominal and real, starts in 2001, which can be confirmed at `https://apps.bea.gov/regional/downloadzip.cfm` or from FRED. We instead consider personal income (PI) as a proxy for economic growth. According to the BEA,[IA.2] data for quarterly personal income by state (seasonally adjusted) start as early as 1948 for some states and in 1958 for others. 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. The state-quarterly personal income datasets

[IA.2] See `https://apps.bea.gov/regional/downloadzip.cfm`, zip folder Personal Income by State, Table SQINC1__ALL_AREAS_1948_2022.csv, rows "Personal income."

from both the BEA and REAP websites on personal income give the same numbers. Similarly, we use state-year population data (source: FRED) to construct district-level population-weighted real PI growth rates; we then deflate them using our district-level population-weighted inflation measure from the main paper (by first aggregating it into calendar-quarter frequency).

- The Quarterly Census of Employment and Wages (QCEW) database provides the total wage dollar amount (non-seasonally adjusted) for each county during each quarter from 1975 to 2022.[IA.3] The database is as large as 13 gigabytes, and there are around 3,100 unique counties. Therefore, one obvious advantage of QCEW's wage data is that we can precisely create district-level total wages (and hence growth rates) given the shapefiles; one obvious drawback is that wage data is not highly correlated with personal income or productivity growth, conceptually or empirically; in addition, we need to deal with the strong seasonality in wages.

  To give this measure the best chance, we first verify that 99.7% of the counties included in Fed districts can be found in the QCEW database, except for the San Francisco district, which only overlaps with QCEW by 97.2%. Next, while QCEW does not provide seasonally adjusted (SA) measures, we compute our own seasonally-adjusted measures of wage growth. We first aggregate up and obtain a district-quarter-level total wage amount in dollars by summing up the precise county list. We next apply the BEA's methodology to fix season adjustments.[IA.4] We then subtract the quarterly district inflation from it to obtain real QCEW wage growth.

  We want to understand how informative this QCEW-based U.S. real wage growth is about the governors' forecast of the current real GDP growth, $E_m(gGDP_{q0})$, prepared for meeting m. We use lagged variables as before. We find weak correlations (0.22 in the full sample) between QCEW-based real wage growth and $E_m(gGDP_{q0})$.

- State-quarter-level YoY inflation rates from Hazell, Herreño, Nakamura, and Steinsson (2022). Their data can be obtained from `https://eml.berkeley.edu/~enakamura/papers/statecpi_beta.csv` and from the other authors' websites.[IA.5] The unit of observation in the Hazell et al. (2022) dataset is at the state-quarter-level and it reports YoY (annual) inflation rates for the non-tradable sector, the tradable sector, and all sectors; this database does not include shelter. We focus on "all," denoted as "pi" in their dataset. Their dataset was constructed with proprietary access to a BLS dataset. The dataset covers 33 states and the District of Columbia, and Table IA.3 is a full summary of state coverage and data availability. Overall, their measure has reasonable state-level coverage. However, we find that their dataset is less suitable for our empirical design due to the state overlapping and the quarterly frequency concerns.

[IA.3] Our last download was on May 20, 2023.

[IA.4] To validate our method, we validate the BEA's SA method. The SA process involves the X13ARIMA software developed by the Census Bureau (x13as_ascii-v1-1-b60.zip). We download two wage series with both unadjusted and adjusted time series, available from FRED's website. Using the code, we are able to confirm that FRED's seasonal adjustment method is the same as the default setting of the X13ARIMA method in the Python package "statsmodels." We apply this Python code to all unadjusted district-level data (aggregated up from county-level wage data). We are happy to share our code.

[IA.5] We thank the authors for making their dataset available and taking the time to discuss it with us.

Table IA.3: Data summary of Hazell et al. (2022) raw data availability.

	State	Start	Until	
1	Alabama	1989	2017	
2	Alaska	1978	2017	no 1987,1988
3	Arkansas	1989	2017	
4	California	1978	2017	no 1987,1988
5	Colorado	1989	2017	
6	Connecticut	1989	2017	
7	District of Columbia	1978	2017	no 1987,1988
8	Florida	1978	2017	no 1987,1988
9	Georgia	1978	2017	no 1987,1988
10	Hawaii	1978	2017	no 1987,1988
11	Illinois	1978	2017	no 1987,1988
12	Indiana	1989	2017	
13	Kansas	1989	2017	
14	Louisiana	1989	2017	
15	Maryland	1978	2017	no 1987,1988
16	Massachusetts	1978	2017	no 1987,1988
17	Michigan	1978	2017	no 1987,1988
18	Minnesota	1978	2017	no 1987,1988
19	Mississippi	1989	2017	
20	Missouri	1978	2017	no 1987,1988
21	New Jersey	1978	2017	no 1987,1988
22	New York	1978	2017	no 1987,1988
23	North Carolina	1989	2017	
24	Ohio	1978	2017	no 1987,1988
25	Oklahoma	1989	2017	
26	Oregon	1978	2017	no 1987,1988
27	Pennsylvania	1978	2017	no 1987,1988
28	South Carolina	1989	2017	
29	Tennessee	1978	2017	no 1987,1988
30	Texas	1978	2017	no 1987,1988
31	Utah	1989	2017	
32	Virginia	1989	2017	
33	Washington	1978	2017	no 1987,1988
34	Wisconsin	1978	2017	no 1987,1988

IA.2. Datasets Related to the FOMC

IA.2.1. FOMC events.

We collect all FOMC meetings from January 1958 to December 2019; to answer our research question that involves Federal funds rates and meeting decisions, we eventually focus on all FOMC meetings from January 1969 to December 2019 due to target rate data availability. To be useful, we require that FOMC meetings:

(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 a domestic or global crisis response), 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 outcomes, the Federal funds rate (FFR). 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 investors; when there are no decisions being made or votes being cast, no statement is released. An example is the 1/9/2008 conference call, during which no voting happened and no decision was made.[IA.6] In contrast, the FOMC released a statement on the 10/7/2008 conference call at 7:00 AM EDT on October 8, 2008,[IA.7] which states 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 in its meeting transcript, released five years later).[IA.8] While the two examples above are conference calls, most of the FOMC events in our sample are scheduled meetings. We collect this data to validate Point (1) above.

(3) *Generated transcripts or minutes.* Our research also examines the speech patterns of Reserve Bank presidents and members of the Board of Governors at FOMC meetings. In addition, we examine whether the market understands the role of Reserve Bank presidents at FOMC meetings, and therefore public releases of detailed records of FOMC meeting proceedings are important. Transcripts are the most detailed record of FOMC meetings and are 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 December 2023, we are able to download and retrieve 365 FOMC transcripts, corresponding to meetings from 4/20/1976 to 12/13/2017.

Overall, we have 472 FOMC events from 1/14/1969 to 12/11/2019 that have FFR decisions, public statements/announcements, and recorded transcripts/minutes. In terms of event formality, 459 are meetings and 13 are conference calls. Here are the conference calls that satisfy our research objective:

[IA.6] https://www.federalreserve.gov/monetarypolicy/files/FOMC20080109confcall.pdf.
[IA.7] https://www.federalreserve.gov/newsevents/pressreleases/monetary20081008a.htm.
[IA.8] https://www.federalreserve.gov/monetarypolicy/files/FOMC20081007confcall.pdf.

	Conference Calls in our analysis	Chairman
1	3/10/1978	Arthur F. Burns
2	5/5/1978	G. William Miller
3	3/7/1980	Paul A. Volcker
4	5/6/1980	Paul A. Volcker
5	11/26/1980	Paul A. Volcker
6	12/5/1980	Paul A. Volcker
7	12/12/1980	Paul A. Volcker
8	2/24/1981	Paul A. Volcker
9	5/6/1981	Paul A. Volcker
10	10/15/1998	Alan Greenspan
11	4/18/2001	Alan Greenspan
12	9/17/2001	Alan Greenspan
13	10/7/2008	Ben S. Bernanke

For simplicity, we refer to all of them as FOMC meetings in the paper. Our results are robust when we drop the conference calls (as shown in Table IB.2 of this Internet Appendix).

IA.2.2. FOMC dissenter data.

Source Documents

To collect our dissenter data, we compile the voting results for each member – agree or dissent – from various publicly available documents that describe the *proceedings* of the FOMC. There are 12 votes, but that number does vary over time, especially during turnovers and transitions (see Figure 2 in the paper). 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 2017, 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 2017-2019, 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 1976-2019. 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

-10-

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 FOMC meetings has three steps. First, we use Python to parse down the full participant roster of each meeting as listed on the first or second page of the various meeting records available on the Federal Reserve website. One major challenge during this process is that the formats of these documents have changed quite a few times over the past 62 years. Therefore, we also manually check 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 affiliations are not mentioned at all, which can be observed in some examples above. Common last names such as "Johnson" or "Meyer" could refer to different people at different meetings or from different districts.[IA.9] The third challenge is that the same person could also serve both as a governor and a district president during their central banking career. For instance, Janet L. Yellen was a governor 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 a participant's name), we build from scratch 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 various Reserve Bank websites for president information.[IA.10]

In the second step, we identify the voting outcomes. It is easy to identify dissenters, as public statements, minutes, transcripts, and other meeting records all summarize this information in one or two sentences. In this step, we build on the existing effort by Thornton and Wheelock (2014);[IA.11] they provide the *last names* of the voting members who dissented in FOMC scheduled meetings from 1936 to present. We make several important 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 the voting decisions by every member. Finally, we report full names and district and board affiliations. As a result, our dataset is at the meeting-member level, which makes it versatile for other research questions.

IA.2.3. FOMC transcript data.

To conduct the textual analysis discussed in Section 4, we need transcripts that record all words spoken by meeting participants (voting and non-voting), word for word. Transcripts have a 5-year delay in public release and are only publicly available from 1976. Therefore, the longest transcript sample we can obtain is from 4/20/1976 to 12/13/2017 (which is the last transcript available at the time of our latest empirical update). 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 365 transcripts from 4/20/1976 to 12/13/2017.

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

[IA.9] Starting with the January 26-27, 2010 meeting, transcripts and minutes dropped the titles and started to include full names.

[IA.10] 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.

[IA.11] Their dataset can be found here: https://www.stlouisfed.org/fomcspeak/history-fomc-dissents.

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.

IA.2.4. 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.[IA.12] Kuttner's dataset starts in 1989, but 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 change in the FFR for meetings after June 19, 2019. This allows us to extend our sample until the last meeting in 2019.

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

[IA.12] 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/1Up04KzMYug9zyKWYFdrOgQD7S6n_Q7d7/edit#gid=696203667. At the time of writing, the last available update is the June 19, 2019 meeting.

IA.3. Recent Media Evidence

1. The 2023 to 2024 Voting Rotation: https://www.barrons.com/articles/fed-interest-rates-2024-election-outlook-0831db6d, December 23, 2023, Barron's.

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From left to right: Mary Daly, Loretta Mester, Raphael Bostic, and Thomas Barkin. (ILLUSTRATION BY LYNNE CARTY/BARRON'S; BLOOMBERG (3); FEDERAL RESERVE BANK OF RICHMOND (BARKIN))

FEDERAL RESERVE | FEATURE

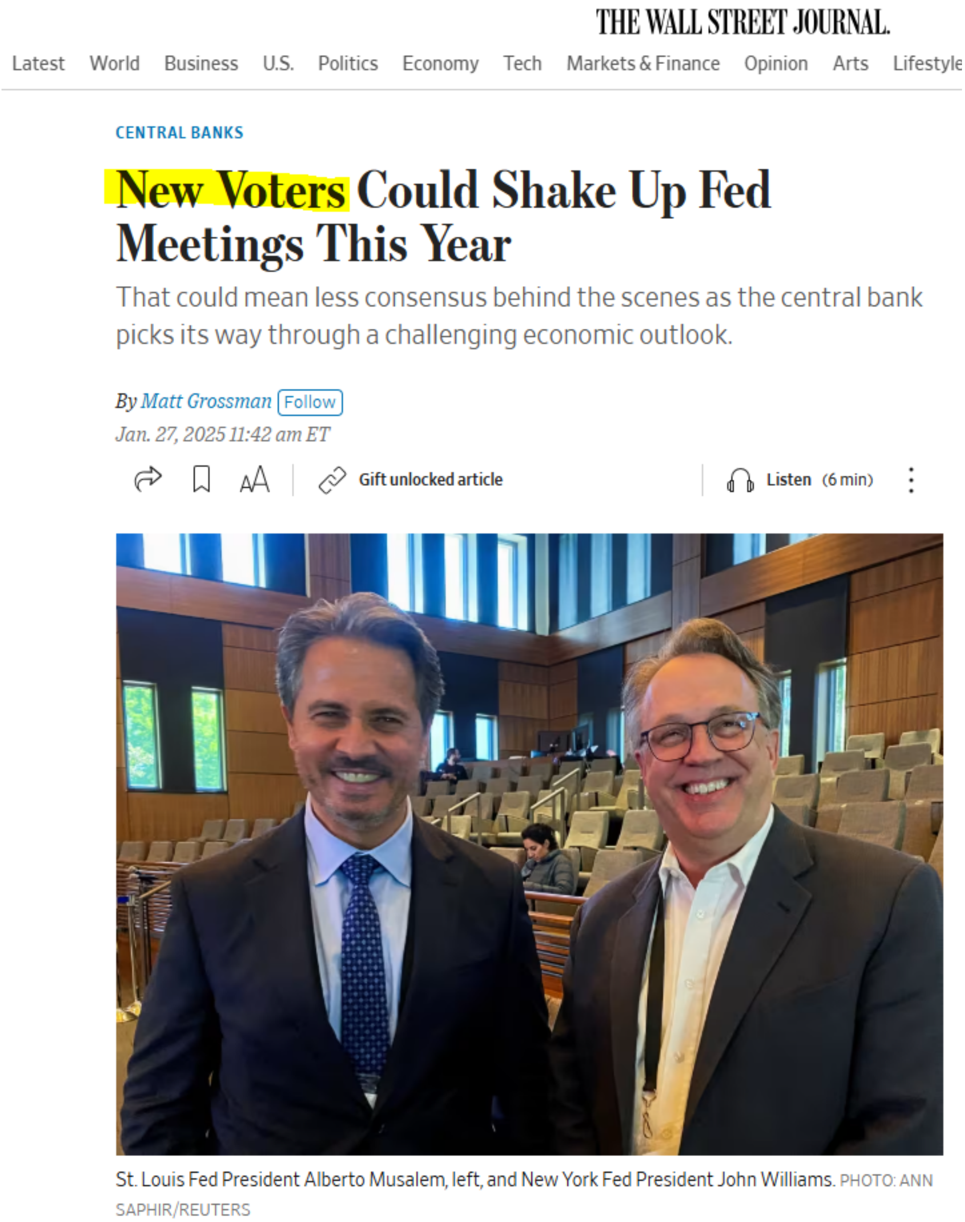
The Fed Faces Multiple Challenges in 2024. Navigating an Election Year Is One.

The Federal Reserve expects to cut interest rates in 2024, but not by as much as the market anticipates. Meet the FOMC's newest members.

By Megan Cassella

Dec 29, 2023, 2:00 am EST

2. The 2024 to 2025 Voting Rotation: https://www.wsj.com/articles/new-voters-could-shake-up-fed-meetings-this-year-6a7000af, January 27, 2025, Wall Street Journal.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CENTRAL BANKS

New Voters Could Shake Up Fed Meetings This Year

That could mean less consensus behind the scenes as the central bank picks its way through a challenging economic outlook.

By *Matt Grossman* Follow

Jan. 27, 2025 11:42 am ET

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St. Louis Fed President Alberto Musalem, left, and New York Fed President John Williams. PHOTO: ANN SAPHIR/REUTERS

IA.4. Futures Data

To capture the market's 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 the market's expectations about 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. These contracts start trading in late 1980s.

The 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 was 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 futures 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 IA.2 shows the day gaps between two consecutive meetings within a year in our sample from 1958 to 2021. Since the 1980s, the gaps seem to stabilize 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.

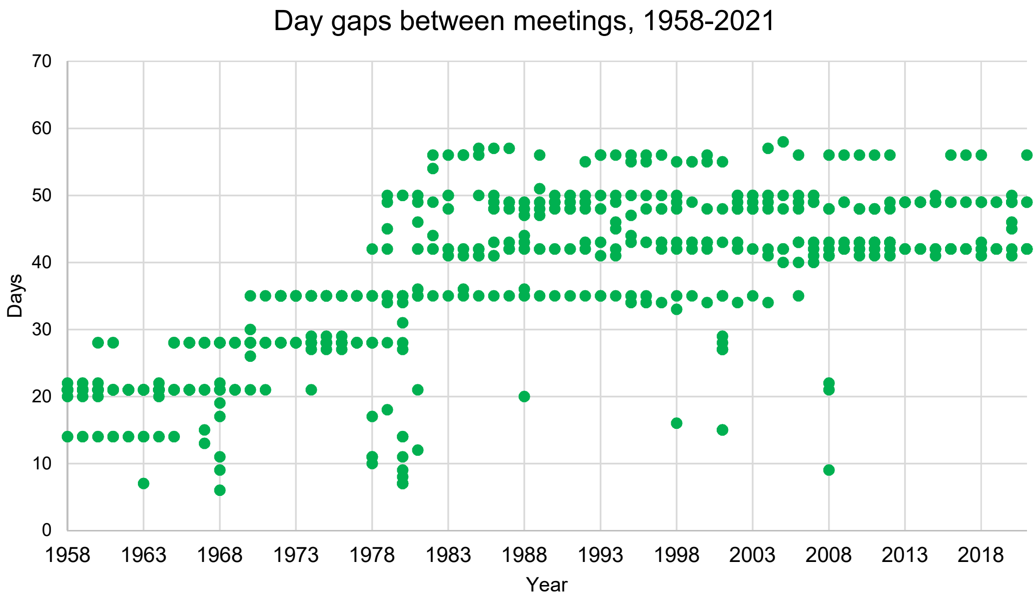

Figure IA.2: Number of days between two meetings. There are a few dots for each year; some years appear to have fewer dots due to overlaps.

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 in Section 6.1; the average implied rate at the end of 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"). We obtain the longest possible sample available from DataStream up to the end of the sample period studied in the present research, 1989-2019.

IB. Supplementary Tables and Figures

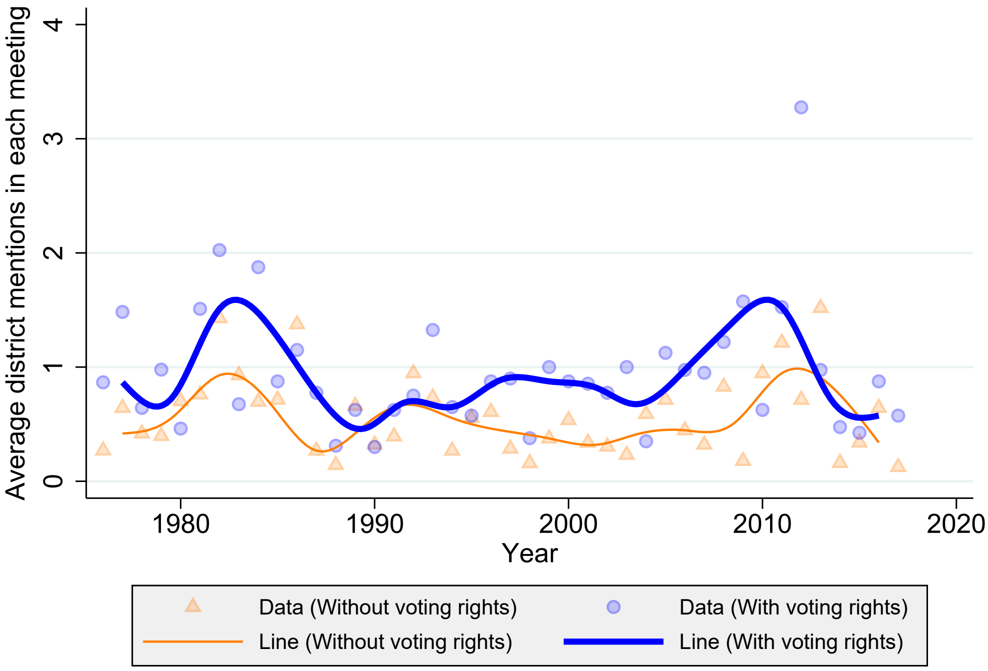

Figure IB.1: **Mentions of voting districts and non-voting districts by governors.** We search words spoken by governors for district keywords (mentions). Mentions of voting districts' keywords are significantly higher than those of non-voting districts' keywords, with a p-value of 0.0000 in a one-sided paired t-test. Regressions are presented in Table **??**, Panel B, Column (2).

Table IB.1: Taylor rule and Greenbook measures (full sample).

Dependent variable:	ΔFFR_m			
	(1)	(2)	(3)	(4)
$E_m(Infl_{q1})$	0.0751***			0.0951***
	(0.023)			(0.026)
$E_m(UNEMP_{q1})$		-0.0217		-0.0467**
		(0.021)		(0.023)
$E_m(gGDP_{q0})$			0.0387**	0.0401**
			(0.017)	(0.016)
FFR_{m-1}	0.2032*	0.2374**	0.2046*	0.1442
	(0.121)	(0.120)	(0.117)	(0.118)
FFR_{m-2}	-0.1920	-0.2022	-0.1940	-0.1873
	(0.196)	(0.196)	(0.188)	(0.184)
FFR_{m-3}	-0.0656	-0.0517	-0.0220	-0.0136
	(0.116)	(0.117)	(0.120)	(0.117)
Constant	0.0208	0.2231	-0.0350	0.1583
	(0.067)	(0.176)	(0.068)	(0.164)
N	453	453	453	453
R^2	0.11	0.086	0.11	0.15

Table IB.2: **Predicting changes in the FFR: excluding conference calls.** This table reports robustness results for Table 3 dropping the 13 meetings that were conducted via conference call. See other table notes in Table 3.

Dependent variable:	ΔFFR_m			
Subsample:	*Inflation effective*	*Inflation placebo*	*UR effective*	*UR placebo*
	(1)	(2)	(3)	(4)
$Infl^{Vote}_{m,t-1}$	0.5455**	0.4800		
	(0.221)	(0.336)		
$Infl^{NoVote}_{m,t-1}$	-0.2556	-0.4654		
	(0.218)	(0.394)		
$UR^{Vote}_{m,t-1}$			-0.4762*	-0.0460
			(0.261)	(0.063)
$UR^{NoVote}_{m,t-1}$			-0.0042	-0.0089
			(0.318)	(0.057)
$E_m(Infl_{q1})$	0.0890	0.0801***	0.0829	0.1047***
	(0.061)	(0.030)	(0.071)	(0.027)
$E_m(UNEMP_{q1})$	0.0072	-0.0335	0.3866	0.0509
	(0.050)	(0.025)	(0.414)	(0.092)
$E_m(gGDP_{q0})$	0.0052	0.0119	0.0497	0.0271
	(0.058)	(0.012)	(0.060)	(0.019)
FFR_{m-1}	-0.1314	0.2512**	-0.0391	0.2149*
	(0.285)	(0.109)	(0.222)	(0.116)
FFR_{m-2}	-0.0655	-0.0449	0.0692	-0.0368
	(0.411)	(0.167)	(0.298)	(0.152)
FFR_{m-3}	0.1762	-0.2635**	-0.1303	-0.2077**
	(0.235)	(0.108)	(0.223)	(0.091)
Constant	-0.1508	0.1770	0.7816	-0.1752*
	(0.229)	(0.196)	(0.639)	(0.106)
N	115	297	94	232
R^2	0.16	0.34	0.18	0.49
% Random t-stat $\geq$ actual t-stat	2.28%	46.7%	3.76%	51.2%

Table IB.3: **Predicting changes in the FFR: Quarterly measures.** This table illustrates results using quarterly measures in respective effective subsamples. Columns (1)-(2) mimic quarterly releases using our MSA-based monthly inflation dataset. Column (1) collapses our MSA-based monthly inflation dataset into a district-quarterly dataset and then merges with FOMC meetings using strictly last quarter's value. Column (2) collapses our MSA-based monthly inflation dataset into a district-quarterly dataset, expands it back into monthly frequency, and then merges with FOMC meetings using our timing criteria assuming quarter-end releases. Column (3) starts with Hazell et al. (2022)'s state-quarterly inflation measures (half of the states have data from 1989-2017 while the rest do from 1978-2017), assigns each state a primary district given the shapefile (as we do to UR), and obtains the population-weighted district-quarterly inflation. To construct the macro variable used in Column (4), we obtain the state-quarterly personal income (PI) growth rates from BEA, calculate state-quarterly real PI growth using the corresponding inflation data, assign each state a primary district given the shapefile (as we do to UR), and finally obtain the population-weighted district-quarterly real PI growth. In terms of timing, Columns (1), (3) and (4) always use the last quarter's measure to match with the FOMC meeting; Column (2) uses the average of t-1, t-2, and t-3.

Dependent variable:	ΔFFR_m			
Subsample:	*Inflation effective*	*Inflation effective*	*Inflation effective*	*Real PI effective*
Inflation measure:	*Last quarterly*	*Last 3 months*	*Last quarterly*	*Last quarterly*
Data source:	*MSA*	*MSA*	*Hazell et al.*	*BEA*
	(1)	(2)	(3)	(4)
$Infl^{Vote}_{m,t-1}$	0.0243	0.0404	-0.3485	
	(0.147)	(0.277)	(1.117)	
$Infl^{NoVote}_{m,t-1}$	0.1113	0.2207	0.3406	
	(0.141)	(0.333)	(1.393)	
$rgPI^{Vote}_{m,t-1}$				0.0438
				(0.132)
$rgPI^{NoVote}_{m,t-1}$				-0.0284
				(0.164)
$E_m(Infl_{q1})$	0.0715	0.0751	0.3102**	0.1545**
	(0.047)	(0.050)	(0.132)	(0.065)
$E_m(UNEMP_{q1})$	0.0175	0.0541	-0.1104	-0.2232**
	(0.046)	(0.045)	(0.115)	(0.093)
$E_m(gGDP_{q0})$	0.0412	-0.0247	0.1474**	0.0683**
	(0.047)	(0.053)	(0.066)	(0.033)
FFR_{m-1}	-0.0939	0.5374**	-0.2274	-0.0086
	(0.267)	(0.227)	(0.162)	(0.117)
FFR_{m-2}	-0.1157	-0.8414**	-0.1054	-0.1234
	(0.400)	(0.349)	(0.317)	(0.258)
FFR_{m-3}	0.2004	0.2871	0.2011	0.0748
	(0.246)	(0.238)	(0.227)	(0.211)
Constant	-0.3970*	-0.3500	0.1247	0.9904**
	(0.233)	(0.215)	(0.560)	(0.440)
N	128	128	84	140
R^2	0.15	0.27	0.24	0.15