Do the Voting Rights of Federal Reserve Bank Presidents Matter?*

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Abstract

Voting seats at FOMC meetings rotate exogenously among Reserve Bank presidents on a yearly basis. Using detailed data on 472 FOMC meetings that took place between 1969 and 2019, we show that when there is a substantial dispersion in inflation across districts, inflation in Reserve Bank presidents' districts affects Federal funds target rates only when those presidents hold voting seats at FOMC meetings. The economic conditions in voting districts are a source of monetary policy shocks, affect Taylor rule regressions, and have a profound effect on financial markets. The path of the target rate would have been different if the economic conditions in all districts affected FOMC decisions.

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1. Introduction

The Federal Reserve System (the Fed) is responsible for setting monetary policy in the United States, 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.

We use detailed data on 472 FOMC meetings that took place between 1969 and 2019 and the predetermined rotations of Reserve Bank presidents' voting rights (since 1942) to show that when there is a substantial dispersion in inflation across districts, inflation in Reserve Bank presidents' districts affects the FFR only when those presidents hold voting seats at FOMC meetings. 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 0.25-0.29 SD or 10-13 basis point increase in the next FFR. In the same specification, the coefficients for inflation in non-voting districts are indistinguishable from zero. This decomposition result survives a series of robustness tests, including tests that involve a wide range of alternative district-level inflation measures. It should be noted that the rotating nature of Reserve Bank presidents' voting rights was determined in 1942, implying

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

that the allocation of voting rights is exogenous to the economic conditions in Reserve Bank presidents' districts.[2]

To provide more direct support for the voting mechanism, we use hand-collected data to track the voting decisions of each voting participant in a meeting and show that voting presidents dissent based on inflation in their districts. According to FOMC transcripts, voting districts are 20% more likely to be mentioned by governors and Reserve Bank presidents during FOMC meetings than are non-voting districts. Governors' attitudes towards voting presidents are also more positive than their attitudes towards non-voting presidents.

This mechanism has the potential to improve our understanding of how monetary policy decisions are made. First, we show that the FOMC voting structure is a systematic source of Romer and Romer (2004) monetary policy (MP) shocks, measured as the difference between the actual FFR decision and the intended FFR at the start of the meeting. We find that a one standard deviation increase in voting district inflation leads to a 0.26 SD increase in the MP shock, which is economically sizable because the Romer-Romer MP shock explains 45% of the variation in changes in the FFR. The results are robust after controlling for national conditions. Second, we augment a state-of-the-art Taylor rule model with the inflation in voting and non-voting districts. We find that in most specifications voting district inflation is a positive and significant determinant of changes in the FFR when we control for non-voting district inflation, national inflation, or the Greenbook inflation forecast. These findings indicate that inflation in *voting* districts contributes to our understanding of monetary policy above and beyond *aggregate* economic conditions.

Next, we test whether inflation in voting districts affects asset prices. We find that inflation in voting districts has a robust positive effect on changes in Treasury yields, particularly at shorter maturities. A one SD increase in voting district inflation leads to a 0.31-0.4 SD increase in the yield change across various maturities from 3 months to 10 years. Inflation in non-voting districts does not affect changes in long-term Treasury yields. The results are robust after we control for national inflation.

The effects on Treasury yields begin to peak and become statistically significant one week before FOMC meetings, indicating that the market prices in voting district inflation prior to the meeting. Indeed, using Federal funds futures data from 1989 to 2019, we show that market participants understand and price the effect of local inflation on FOMC decisions. We find that inflation for voting districts has robust,

[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

significant effects on changes in average FF futures rates from the end of the previous meeting to the end of the current meeting.

Finally, we show that distortions in the target rates 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 decades to correct. For instance, target rates would have been 36 basis points higher during the pre-Global Financial Crisis period (2000-2005) if economic conditions in all districts had been taken into account equally. We also find that if votes were allocated between districts according to their economic size, the distortion in the target rates due to the existing voting scheme would be pronounced. This is consistent with the dramatic shift in the geographical allocation of economic activity across districts, such as the rise of the San Francisco District (covering Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, and Washington) since the mid-1980s.

We conclude the paper with a discussion of how to address these distortions. FOMC members could change their behavior and place greater emphasis on national inflation, rather than on inflation in voting districts. However, as long as regional presidents care about inflation in their districts and only some presidents vote, the power of incentives suggests that distortions in FOMC decisions are likely to persist. Alternatively, with Congressional approval, policymakers could change the voting structure of the FOMC either by giving voting rights to all reserve bank presidents or by removing those rights from all presidents so that only governors vote. Both approaches have shortcomings. Allocating (equal) voting rights to all presidents and governors could marginalize the role of governors (7 governors versus 12 reserve bank presidents). Allocating voting rights to governors only could reduce reserve bank presidents' interest in the FOMC because they would have no formal influence on FOMC decisions. Finally, policymakers could revise the Reserve Bank district boundaries. The current boundaries reflect economic activity at the time the district map was designed, i.e., about a century ago. Since the geographical allocation of economic activity in the U.S. has dramatically changed, the existing district maps lead to an unequal allocation of votes across units of economic activity.

Our paper contributes to several strands of the economics and finance literature. First, it contributes to the macroeconomics literature that studies the determinants of monetary policy decisions. In his seminal work, Taylor (1993) demonstrates that past monetary policy rules can be closely tracked by changes in the price level or real income. 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 monetary policy decisions.[3]

While this study focuses on the real consequences of the FOMC voting structure, our research also relates to the literature that studies the voting behaviors of FOMC members and their background characteristics (e.g., Belden (1989), Havrilesky and Schweitzer (1990), Havrilesky and Gildea (1991), Chappell Jr, Havrilesky, and McGregor (1993), Chappell Jr and McGregor (2000), Crowe and Meade (2008), Malmendier, Nagel, and Yan (2021), and Bordo and Istrefi (2023)). The standard empirical framework in this literature has individual-level interest rate preferences (as revealed in meeting transcripts or other documents) as the dependent variable of interest and individual-level characteristics (e.g., career, political party, education, gender, local economy, and so on) as explanatory variables. Existing studies acknowledge the importance of understanding the effect of personal biases on monetary policy decisions, but have not reached a consensus.[4] Our study differs from this literature in two major ways. First, and most importantly, while the literature focuses on examining the voting members' personal biases, our main goal is to compare voting and non-voting Reserve Bank presidents and their relative effects on FOMC decisions.[5] Second, our voting sample extends from 1/7/1958 to 12/11/2019, a much longer sample than, to the best of our knowledge, all existing papers in this personal bias literature, which increases the statistical power of our tests.

Second, our paper contributes to the political economy literature that studies the balance of power between various forms of government, including the federal government, the states, and municipalities. This literature has analyzed the provision of a wide range of services, including welfare, legal services, health services, and hous-

[3]In a contemporaneous work, Hack, Istrefi, and Meier (2023) use 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 economic outcomes (e.g., GDP). Our study is instead focused on the difference in economic conditions between voting and non-voting districts. Importantly, we show that local economic conditions affect FOMC voting decisions when we control for voting member "type" by including individual fixed effects, implying that local economic conditions play a distinct role from the composition of hawks and doves in the FOMC. Consistent with our dissent results, Bobrov, Kamdar, and Ulate (2024) use another macro variable (unemployment rates) to predict dissent decisions. Our paper differs from their work as our main contribution is to show that voting district inflation rates have causal effects on aggregate monetary and real outcomes.

[4]Among those of more relevance for our research, 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 arrive at the opposite conclusion, supporting the role of regional developments in explaining presidents' interest rate preferences. Jung and Latsos (2014) represent a more recent update in this debate using a 1990-2008 sample but find mixed results. None of these studies examines the real effects on FOMC voting.

[5]In a different setting, Chen (2017) shows that local economic conditions have a significant effect on firm managers' macroeconomic expectations and consequently on firms' investment and employment decisions.

ing (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)). Consistent with an insightful theoretical discussion of the FOMC governance structure by Faust (1996), our paper contributes to this literature by providing the first evidence on the effects of decision rights allocated to Federal Reserve Banks on macroeconomic policy. Specifically, we show how national and local inflation rates are aggregated into FOMC decisions and how the voting rights of FOMC members affect this aggregation process. Furthermore, Fos, Tamburelli, and Xu (2024) focus on non-voting district behaviors and establish the existence of "local monetary policy." They show that when Federal Reserve districts experience high inflation but lack voting rights to influence FOMC decisions, Federal Reserve Banks reduce the amount of credit extended via the discount window.

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.[6] The Federal Open Market Committee (FOMC) is the monetary policymaking body of the Federal Reserve System and was created by the Banking Act of 1933. Voting rights in the 1933 FOMC were exclusive to the twelve Reserve Bank presidents; this was amended in 1935 and 1942 to extend voting rights to the Federal Reserve Board of Governors. This is the modern FOMC, which consists of twelve voting members—the seven members of the Board of Governors of the Federal Reserve System, the president of the Federal Reserve Bank of New York, and four of the remaining eleven Reserve Bank presidents,

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

who serve one-year terms on a rotating basis.

Members of the Board of Governors are nominated by the President of the United States and confirmed by the Senate. Each governor can serve up to 14 years, and the terms are staggered such that one term expires every two years. If a governor leaves before her term is up, 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 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 put in place in the 1942 amendment.[7] The rotating seats are filled from the following four groups of Banks, one Bank president from each group: (1) Boston, Philadelphia, and Richmond; (2) Cleveland and Chicago; (3) Atlanta, St. Louis, and Dallas; (4) Minneapolis, Kansas City, and San Francisco. 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 the maps of the twelve districts. Importantly, since the assignment of voting rights to presidents of Reserve Banks is specified in Section 12A of the Federal Reserve Act,[8] the public can be, and should be, fully informed about the allocation of voting rights amongst presidents of Reserve Banks.

[Insert Figure 1 here]

The FOMC holds eight regularly scheduled meetings per year.[9] At these meetings, the Committee reviews economic and financial conditions, determines the ap-

[7]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. We show in Internet Appendix Table 2 that deviations from the assigned voting scheme are very rare.

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

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

propriate 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.

3.1. Data Sources

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

3.1.1. FOMC meetings

We focus on all FOMC events (meetings and conference calls) from January 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 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 voted on target rate decisions.[10] 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.[11]

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. Later in the paper, we focus on transcripts to shed light on how the voting rights of district presidents affect their voting and communication decisions. Transcripts are made available to the public with a five-year delay, and the first transcript record from the Federal Reserve archive is the 4/20/1976 meeting.

[10] 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 involved decisions on money supply and exchange rates.

[11] We run robustness tests of our main results dropping the 13 conference calls in the Internet Appendix.

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.[12] The blue solid line and the dashed orange line decompose the total number of actual votes into the number of voting presidents and governors, respectively, and show that the variation in the number of votes is primarily due to the variation in the number of governors, which is often below 7 due to vacancies.

[Insert Figure 2 here]

3.1.2. Local inflation

Local inflation refers to the inflation rates in the 12 Reserve Bank districts.[13] Because there are no readily available inflation or CPI data reported at the Reserve Bank district level or state level, we rely on data reported by the Bureau of Labor Statistics (BLS). Specifically, BLS reports the "Metropolitan Statistical Area" (MSA) CPI for all urban consumers. Table IA.1 in the Internet Appendix summarizes all data options downloadable from the BLS website at the metropolitan area level and evaluates how suitable they may be to proxy for district-level CPI data based on their time series properties (year coverage and frequency). Given that FOMC meetings happen every month or every other month, CPI data at the monthly frequency is preferred for our research objective as it captures the incremental information that becomes available to or known by FOMC members between two FOMC meetings. 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).

Most of the time, districts have consecutive CPI data at monthly (28.6%), bimonthly (42.8%), or three-month frequency (13.4%),[14] and the sample frequency can vary over time within the same district. To impose consistency across districts, we construct monthly inflation rates. For monthly CPI series, monthly inflation is the percentage change in CPI. For other frequencies (bimonthly or quarterly), we compute the percentage changes between two consecutive 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

[12] 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.

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

[14] 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).

available March and May CPI values is 0.4%, we assign the April and May inflation rates a value of 0.2%.[15]

Next, we describe how we match FOMC meetings and inflation rates. Ideally, we want to identify the most recent monthly inflation rates that (i) should enter policymakers' information set and hence influence their inflation forecasts and (ii) are not influenced by the FOMC meeting under consideration. A naïve match that simply uses the lagged monthly (imputed) inflation rates may introduce a measurement error because CPI data is often released at a lower than monthly frequency. 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 can influence our analysis results if the February meeting decisions affect the February and March inflation rates. However, it is also not ideal to use inflation rates from whenever the last measurement is available (i.e., two or three months ago) because there could be another FOMC meeting between the last inflation measurement and the FOMC meeting under consideration. Moreover, contemporaneous monthly inflation rates could affect (and therefore be useful for) FOMC decisions for two reasons. First, presidents are likely aware of contemporaneous local inflation information given personal and workplace interactions. In addition, since most (68.4%) meetings take place during the second half of a month (see Figure IA.1 in the Internet Appendix), decisions made at these meetings are not likely to affect the contemporaneous month's inflation.

Given these trade-offs, we use the following approach to match FOMC meetings and inflation series and explore two alternatives for robustness later. If there is a new CPI measurement in the month prior to the meeting month ($t(m)$ or t for simplicity), we use the last month's inflation ($t-1$) no matter what its collection schedule — monthly, bimonthly or trimonthly. When CPI data are measured on a bimonthly (trimonthly) schedule, if the most recent measurement is during the current meeting month t and the FOMC meeting is during the second half of the month, we use the contemporaneous inflation using CPI data from $t-2$ to t (from $t-3$ to t). Otherwise, we use the inflation rates from the most recent past CPI measurement. We consider two robustness tests to confirm that our results are not sensitive to this matching procedure. First, we construct a measure of inflation that does not take into account district-month observations for which the inflation measure is very sensitive to the matching procedure. Specifically, we drop district-meetings for which changing

[15] In the cases with 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.

the matching procedure (relative to the naïve approach) leads to a larger than two standard deviation change in measured inflation (see the distribution in Figure IA.2 in the Internet Appendix). We refer to this sample as the "robust inflation measurement sample" in the rest of the paper. Second, we consider an inflation measure that is based on historical information only; we discuss this test later in Table 4, Column (3).

We aggregate districts into two groups: districts with voting rights and 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 monthly or quarterly macro variable is time stamped with "t." Given our research objective, we are interested in tracking recent past inflation in districts with and without voting rights in meeting m, which we denote as $\{m, t-1\}$. The previous month's U.S. inflation rate is denoted as $Infl_{m,t-1}^{US}$. The inflation variables in this paper are all in units of monthly percent. We report the results of several robustness tests later in Table 4 concerning our inflation measure. We examine an array of alternative inflation variables in terms of granular-level data sources (e.g., main MSA), inflation measurement timing, and horizons (e.g., 1 month vs. 3 months).

In Internet Appendix Section IA.2 we explain our efforts to find other data sources to proxy for local macro variables that would be suitable for our research question. We obtain and study state-month-level unemployment rates (source: BLS), state-quarter-level personal income (source: BEA), county-quarter-level wage data (source: Quarterly Census of Employment and Wages), and state-quarter-level inflation data (source: Hazell, Herreño, Nakamura, and Steinsson (2022)). In summary, they mostly share two common limitations. First, these sources have state-level data, which leads to an overlapping concern as states do not uniquely correspond to districts. That is, we are interested in exploiting cross-district variation in inflation and therefore do not want to create spurious correlation in inflation across districts. Second, these sources have data at a lower than monthly frequency (e.g., quarterly). This is a limitation because we are interested in identifying new information arriving between FOMC meetings and there are typically two meetings within a calendar quarter.

3.1.3. Outcome variables

Target Federal funds rate data. We use standard data sources to obtain information on FFRs. Romer and Romer (2004) provide data that cover FOMC meetings from the January 14, 1969 meeting through the December 17, 1996 meeting. Kenneth N. Kuttner's dataset covers FOMC meetings from the February 5, 1997 meeting to the June 19, 2019 meeting. Starting in 2008, the target rate becomes a range. Given that most studies are interested in changes in the target FFR, we follow Kuttner's choice of using the change in the lower range value to obtain the changes in the FFR for meetings after June 19, 2019.[16] This allows us to extend our sample through the end of 2019.

FOMC voting. We collect voting results for each participant in an FOMC meeting – agree, dissent for a tighter monetary policy, dissent for an easier monetary policy, or dissent for other reasons – from various public FOMC documents that describe the proceedings of FOMC meetings: Record of Policy Actions (before 1967), Record of Policy Actions and Minutes of Actions (1967-1975), Transcript and Minutes (1976-2017),[17] and Minutes (2017-2019). We start with the existing effort made by Thornton and Wheelock (2014), whose dataset provides the last names of all dissenters in a meeting (i.e., 09/21/11, Fisher, Kocherlakota, Plosser). We 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.3.

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.

Monetary policy shocks. We focus on Romer and Romer (2004)'s monetary shocks, denoted by $DTARG$, that capture the difference between the actual FFR decision and the proposed or "initial intended" FFR entering the meeting, using a narrative and direct approach (i.e., manually collecting the intended and actual rates based on FOMC documents). This approach allows the sample to go back to 1969, whereas the high-frequency shocks in the literature typically start in the late 1990s and early 2000s. We

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

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

obtain the 1969-1996 series from Romer and Romer (2004) and the 1997-2007 series from Wieland and Yang (2020).

Federal funds futures. Following the literature (e.g., Kuttner (2001), Bernanke and Kuttner (2005), Gürkaynak (2005)), we use the price of Federal funds futures contracts averaged over the settlement month.[18] Our measure is the average implied rate of Federal funds contracts across 1- through 24-month terms, denoted by Δf_m, which is readily downloadable from Refinitiv DataStream starting in 1989. Internet Appendix Section IA.4 offers more data details.

3.2. Descriptive Statistics

Summary statistics for all variables that appear in our specifications are relegated to Appendix Tables A1, A2 and A3, and we explain more as we discuss the results. In this section, we briefly discuss variables used to establish the main decomposition result. In Table A1, we report summary statistics for changes in the FFR as well as inflation and real personal income growth variables. Panel As cover the full 1969-2019 sample period, and Panel Bs cover 1969-2019 excluding the zero lower bound (ZLB) period. The latter is the main sample of our paper, as during the ZLB period, the FFR is not the main tool of U.S. monetary policy.

Consider first the full 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 0.35% and 0.36%, respectively. The summary statistics in Panel B are quite similar to those in Panel A. Appendix Table A3 reports the summary statistics of other variables used in our time-series specifications, including the Romer and Romer (2004) monetary shock, changes in yield rates at various maturities, changes in the average FF futures rates, in order of appearance in the rest of the paper. Appendix Table A2 reports the summary statistics of variables used in our panel evidence.

Next, we turn to the time-series properties of district-level inflation rates. The unconditional correlation between inflation rates for voting and non-voting districts is, as expected, high in the full time-series sample and the non-ZLB sample. Figure 3 shows that the time-varying correlation between average inflation rates for voting and

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

non-voting districts within a moving rolling window (50 meetings) fluctuates substantially during the sample period, taking values mostly between 36.5% and 95.3%.

[Insert Figure 3 here]

4. Main Results

In this section, we use the rotating structure of FOMC voting to decompose national inflation into inflation for voting and non-voting districts. We then provide the first evidence on the real consequences of the rotating structure of FOMC voting.

4.1. The Exogenous Rotation of FOMC Voting

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

First, we show that prespecified voting rights determine which Reserve Bank presidents can vote at an FOMC meeting. That is, the intended voting scheme indeed closely tracks with the actual voting scheme (see Table 1). 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.[19] 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 0.90 and are highly statistically significant with large F-statistics.[20]

[Insert Table 1 here]

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 inflation (see Table 2). We find no significant relationship between local inflation and whether a

[19] In the sample period, which runs from 1969-2019, 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).

[20] Small deviations are expected due to health issues or other reasons, such 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 7). 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).

district's representative can vote in an FOMC meeting. Thus, the results of two tests support the assumption that we can treat the variation in district presidents' voting rights as exogenous to local inflation and to the outcome variables we consider.

[Insert Table 2 here]

4.2. The Effect of Local Inflation on the FFR: The Role of FOMC Voting

In this section we present the main decomposition result of our paper — the effect of local inflation and the FOMC's voting structure on the FFR. The main outcome variable is the change in the Federal funds target rates between meetings. Specifically, we estimate the following specification:

$$\Delta FFR_m = \alpha + \beta_1 Infl^{Vote}_{m,t-1} + \beta_2 Infl^{NoVote}_{m,t-1} + \tau FFR_{m-1} + \varepsilon_m, \tag{1}$$

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, $Infl^{Vote}_{m,t-1}$ is the last average monthly inflation rate for voting districts prior to meeting m, and $Infl^{NoVote}_{m,t-1}$ is the last average monthly inflation rate for non-voting districts. FFR_{m-1} is the Fed funds target rate from meeting $m-1$. The unit of observation is one FOMC meeting.

The results are reported in Table 3. Panel A reports baseline results. Column (1) shows that, as expected, higher national inflation is a positive predictor of an increase in the FFR. Specifically, in terms of economic magnitude, a one standard deviation (SD) increase in national inflation in the preceding month, compared to the historical average, predicts a 0.14 SD or 8.8 basis point increase in the next FFR.

[Insert Table 3 here]

In Columns (2) and (3) we show that higher inflation remains a positive and significant predictor of an increase in the FFR in two important subsamples. In Column (2), we estimate the regression in the high inflation dispersion subsample. When districts have different (similar) inflation rates, it is more (less) critical which district is voting. We therefore expect the decomposition results to be pronounced in the high inflation dispersion subsample. Figure 4 shows which FOMC meetings are included in the high inflation dispersion subsample. In Column (3), we further make sure that the timing of inflation measurement is not driving the results (see Section 3.1.2 for a detailed discussion). Our findings indicate that the relationship between national inflation and the FFR remains positive and significant in these subsamples.

[Insert Figure 4 here]

Columns (4) through (6) 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 only and only in the subsample with high inflation dispersion across districts (Columns (5) and (6)). In terms of economic magnitude, the estimates in Column (5) indicate that a one SD increase in the voting district average inflation in the last month predicts a 0.25 SD or 10.0 basis point increase in the next FFR. In contrast, there is no such relationship for a non-voting district's inflation: the relationship between the inflation average of non-voting districts and changes in the FFR is indistinguishable from zero. Importantly, for non-voting districts, the economic magnitude of the estimated coefficient is three times smaller than for voting districts. This finding is the first indication in the literature that during periods of high inflation dispersion across districts the voting rights of FOMC members have a profound effect on one of the FOMC's most important decisions.

Next, we repeat the analysis while dropping the 57 FOMC meetings that occurred during the zero lower bound (ZLB) period (December 2008 to December 2015). We drop these observations because there is a limit on how FFRs can change during this period. Panel B in Table 3 reports the results. As expected, most of our key coefficients exhibit greater economic significance because we removed the FOMC meetings in which decisions were not focused on changing the FFR target rate. Based on the non-ZLB results in Column (6), a one SD increase in a voting district's last period inflation predicts a 0.29 SD or 12.7 basis point increase in the next FFR. In the remaining part of the paper we use the sample of 206 non-ZLB and high inflation dispersion FOMC meetings as our main sample of interest.

We perform several robustness tests. First, we show that the results are robust to using alternative constructions of district-level inflation, in terms of aggregation strategy, measurement timing, and horizons. Table 4 summarizes the regression results. Our results are robust to (i) measuring inflation as the main MSA inflation measure in a district (Column (2)), (ii) measuring inflation using data available at the time of the FOMC meeting (Column (3)), and (iii) measuring inflation during the three months that precede a given FOMC meeting. The economic magnitudes are quite similar across alternative inflation measures. For instance, Columns (2)-(4) show a significant relationship between FFR changes and voting district inflation, which translates to a 0.21-0.33 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.

[Insert Table 4 here]

We also find that when the regression includes further non-overlapping lags for inflation for voting and non-voting districts, the largest and most significant positive coefficients are obtained for the most recent measures. Detailed results are relegated to Table IB.1 in the Internet Appendix. This empirical finding indicates that changes in the FFR are plausibly most sensitive to recent developments in local inflation, which in turn lends support to our main inflation choice.

Overall, we find that our results are not particularly sensitive to any of these robustness tests based on alternative inflation measures. Having said that, as we explain in the Data section, we believe that our default measure of inflation is the most suitable for addressing the research question at hand.

To further demonstrate that our decomposition result is not driven by randomness noise, we simulate 5,000 random voting schedules. For each year, we assign FOMC votes as follows. New York always votes and 4 additional voting seats are randomly picked from the remaining 11 districts. For each simulated voting schedule, we calculate the average voting and non-voting inflation series and recompute the coefficient and t-statistics of these two series in our main no-ZLB and high dispersion subsample. Figure IB.2 shows the histograms of the t statistics, with blue shaded bars indicating the median values and red bars indicating t statistics that correspond to the actual voting scheme.

The simulation shows two important results. First, it is more common for non-voting inflation to be significant than for voting inflation, as the non-voting histogram (plot (b)) seems to be more shifted to the right than the voting histogram (plot (a)). This is expected given that the non-voting group is larger (7 out of 11 districts are non-voting; note that the New York district is always excluded from the non-voting group). Second, it is extremely rare (around 3%) to have a statistical significance for the voting inflation that is as high as that from the actual voting schedule. Thus, if the estimated coefficients captured randomness and noise, it would be very unlikely for the voting coefficient to be as significant as it is in the main specification.

In our second set of robustness tests, we investigate whether our results change if we drop a district or a group of districts based on geography. Figure 5 shows that for most districts, our main finding has some sensitivity to dropping a district. However, some districts seem to be more important than others. Specifically, we find that our results are slightly stronger when we drop the St Louis or Dallas districts. When we drop the Boston, New York, Chicago, or San Francisco districts, our results are slightly weaker. For example, when we drop the New York district, the coefficient drops from 0.4235 to 0.3363 and remains statistically significant. This is an important robustness test because the New York district's president's voting right is not rotating. When we drop groups of districts, we find that only dropping the Boston-Philadelphia-Richmond group leads to a significant change in the estimated coefficient, indicating members of this geographic group likely utilize their voting rights to a greater extent than members of other groups do.

[Insert Figures 5 here]

Finally, we show that our results are robust to the exclusion of the 13 conference call meetings, as shown in Table IB.2 in the Internet Appendix. Our results are also robust to the inclusion of three lags of the FFR in the regression to allow for interest rate smoothing (following Coibion and Gorodnichenko (2012)). The results are reported in the Table IB.3. Moreover, Table IB.4 presents the lack of significance in the decomposition if we consider the low inflation dispersion period. Table IB.5 presents evidence on robustness if we use the standard deviation (of the 12 district inflation rates) instead of the max-min spread to measure inflation dispersion. Lastly, Table IB.6 shows that the results are robust to controlling for lagged quarterly US real personal income (PI) growth.[21]

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

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

4.3.1. FOMC Voting and Local Inflation

We focus on voting dissent decisions at FOMC meetings because these are clearly observable deviations from the consensus opinion. In addition, voting dissent is in-

[21] We construct state population-weighted PI growth (source: BEA) as the district PI growth. Real growth is nominal growth minus district inflation.

formative about the second moment of decision making at an FOMC meeting, while Equation (1) focuses on the level effect.

Specifically, for each voting district president i at FOMC meeting m, we construct the following variable: $Dissent_m^i$ equals one if FOMC voting president i is a dissenter at meeting m and zero otherwise. We then estimate the following regression:

$$Dissent_m^i = \alpha_{g(i)} + \alpha_m + \alpha_i + \beta Infl_{m,t-1}^i + \gamma Infl_{m,t-1}^{US} + \varepsilon_m^i, \quad (2)$$

where $\alpha_{g(i)}$ is district fixed effects, α_m is meeting fixed effects, and α_i is person fixed effects. Inflation is as defined in Equation (1), except that here we use district-meeting-level measures rather than the meeting-level measures used in previous analyses. Panel A in Table A2 reports summary statistics for voting decisions at the meeting-voting president level. The average likelihood of dissent is 8% for voting presidents.

Estimates of Equation (2) are reported in Table 5. Columns (1) through (4) report the results in the baseline sample and Columns (5) through (8) report the results in the robust inflation measurement sample. Columns (1) through (3) and Columns (5) through (7) include district and voting member fixed effects. The results show that a higher inflation rate in a voting president's district predicts a significantly higher likelihood of dissent. In other words, presidents in districts with inflation rates that are higher than other districts or the national level are more likely to dissent. In economic magnitude, Columns (3) and (7) show that a one standard deviation (SD) increase in voting-district inflation in the preceding month predicts a 2.0% and a 2.8% increase in the likelihood of a dissent decision, respectively, which is sizable given that a dissent decision from a Reserve Bank president only occurs at an 8% likelihood (see Table A2).

[Insert Table 5 here]

In Columns (4) and (8), we report the results for a specification that replaces district fixed effects with meeting fixed effects, implying that we only use variation within a meeting. The inclusion of meeting fixed effects also implies that we do not need to control for the national inflation. We find that the results for the robust inflation measurement sample remain robust when we use within-meeting variation in local inflation.

4.3.2. Textual Analysis

In this section, we present an analysis of FOMC transcripts to support more directly our conjecture that the voting rights of reserve bank presidents contribute to the effect inflation in those presidents' districts has on U.S. monetary policy. Under this hypothesis, one would expect establishments and organizations in districts with voting rights to be mentioned more often and "favored" more than those in districts without voting rights.

Summary statistics for the textual analysis sample are reported in Panel C of Table A2. The unit of observation is meeting-district. The average (median) number of times a keyword that can be linked to a district is mentioned by either governors or Reserve Bank presidents is 3.81 (2.00). Governors are less likely to refer to a specific district than presidents of Reserve Banks: the average number of times a keyword that can be linked to a district is mentioned by a governor (a Reserve Bank president) is 0.73 (3.09). This finding indicates that presidents of Reserve Banks are more likely than governors to speak about districts. Besides the district mentions, we also study the Board of Governors' attitudes towards a district during each meeting, by constructing speech similarity scores and sentiment variables. Zeros in these variables meaningfully represent no similarity or neutral sentiment.

We begin the analysis by providing a specific example, in which John J. Balles, president and chief executive officer of the Federal Reserve Bank of San Francisco from 1972 to 1986, voted for a tighter policy on September 18, 1979. These words are from a single block of his speech, rather than an assembly of multiple blocks of his speech during the meeting that reveal his rationale.[22]

> *"Well, in addition to the Sunbelt,* ***the area west of the Rockies*** *is not feeling very much if any recession yet. Aerospace, electronics, and agriculture in general are all quite strong. One indication is that the [volume of] help wanted ads in the* ***Los Angeles Times*** *is almost unreal... In addition to the input that we bring to these meetings and the usual sources of our own research staff and directors, last Friday when* ***Vice Chairman Schultz*** *visited us in* ***San Francisco*** *we called in a special small group of bankers, businessmen, and academicians for a very frank exchange of views. We sounded them out about their feelings on the economy and on Fed policy, and I must say, Fred, that I thought the reactions were quite candid and somewhat humiliating in a way. The bankers generally expressed the view that as yet there's very little evidence that the high level of interest rates is having any significant total effect on cutting off credit demand... So I lean toward the view that we may have to use monetary policy as the principal weapon to break inflationary expectations and to get some deceleration in the actual rate of inflation.* ***Our directors*** *clearly voted to increase the discount*

[22]Here is the exact transcript link: https://www.federalreserve.gov/monetarypolicy/files/FOMC19790918meeting.pdf, pages 27-28.

rate to reinforce what they thought should be a further snugging up in our efforts to get the rate of growth in the aggregates down somewhat."

Next, we perform a descriptive analysis of the relationship between voting rights and mentions of districts' keywords by governors. A district's keywords include geographical features (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.[23] Figure 6 shows that the average number of keywords spoken by governors can be linked to a district having a vote or not during our sample periods. Thick (with voting rights) and thin (without voting rights) lines indicate that, during most of the sample period, districts with voting rights are almost always more frequently mentioned in transcripts than districts without voting rights. This is the first indication of a positive relationship between whether a president of a Reserve Bank has voting rights at an FOMC meeting and the attention given to that district at that meeting.

[Insert Figure 6 here]

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

$$DistrictMentions_m^i = \alpha_m + \beta Vote_m^i + \varepsilon_m^i, \tag{3}$$

where $DistrictMentions_m^i$ is the word count of district i's keywords in meeting m, $Vote_m^i$ equals 1 if district i's president has a voting right in meeting m, and α_m is meeting fixed effects. The inclusion of meeting fixed effects implies that the estimates are based on within-meeting variation in how often voting and non-voting districts are mentioned. The sample covers transcripts for the 1976-2017 period. The unit of observation is meeting-district; that is, for each meeting, there are 12 data points.

The results are reported in Panel A of Table 6. Columns report estimates of the same specification using different word samples to search for district keywords. In Column (1), we count keywords associated with each of the twelve districts using word samples from governors and presidents. We find a positive and significant relationship

[23]The full list is available upon request.

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 in the transcript by presidents or governors. 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% more likely to be mentioned if its president is a voting member of the meeting.

[Insert Table 6 here]

We next differentiate between 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. 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 Figure 6.

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

Panel B of Table 6 studies the attitude of governors toward districts. We use three measures of 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)). 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 towards voting districts than towards non-voting districts. This is an economically sizable difference, given that the unconditional agreement score is 0.22.

5. Implications

In the previous section, we establish the main decomposition result: FFR decisions are more sensitive to inflation in voting districts than in non-voting districts. Since the allocation of voting rights among districts is predetermined and exogenous to districts' inflation, these findings imply that the effect on FOMC decisions is causal. In this section, we investigate whether these findings have significant implications for key academic research areas and policy issues. Importantly, we assess whether inflation in voting districts has incremental explanatory power above and beyond national inflation.

5.1. Implications for Monetary Policy Shocks

In this section, we explore the possibility that the FOMC voting structure may be a source of monetary policy shocks. To do so, we use a measure of monetary policy shocks as a dependent variable in Equation (1). In particular, we focus on Romer and Romer (2004)'s monetary shocks because this concept precisely captures what policymakers do and believe, which is conceptually closer to our research objective thus far. Romer-Romer monetary shocks calculate the difference between the actual FFR decision and the intended FFR at the beginning of the meeting. The sample goes back to 1969. Table 7 reports the results.

[Insert Table 7 here]

The results in Column (1) show that national inflation is a significant positive predictor of monetary shocks. Column (2) shows that when we decompose national inflation into inflation in voting and non-voting districts, inflation in voting districts is a significant determinant of monetary shocks. In contrast, the coefficient of inflation in non-voting districts is insignificant. For instance, a one SD increase in voting district inflation leads to an 8.5 bps or 0.26 SD increase in Romer-Romer shocks. In addition, Romer-Romer shocks empirically account for almost 45% of the total variance of changes in the FFR from meeting $m-1$ to meeting m during our sample period. As a result, the economic magnitude of the effect of voting district inflation on the Romer-Romer shocks is considered sizable. In Column (3), we show that when we control for national inflation, the coefficient for inflation in voting districts retains its economic magnitude but becomes insignificant. Columns (4)-(6) repeat the previous three columns using our robust inflation measurement sample.

5.2. Implications for the Taylor Rule

We continue investigating whether our findings change the way we understand the determinants of monetary policy. Taylor (1993) demonstrates that past monetary policy rules can be closely tracked by changes in the price level or real income. Building on that, the literature has enhanced the reduced-form model by including lagged target rates and Greenbook forecasts.[24] In this section, we estimate the Taylor rule augmented with recent inflation from districts with or without voting rights. Our approach builds on but differs from a general specification of the Taylor rule, as we accommodate local inflation to reflect our research objective. The Taylor rule is forward looking, and therefore, in its empirical adaptation, the recent literature uses the Greenbook (currently known as the Tealbook) to obtain Federal Reserve Board of Governors staff members' forecasts for the aggregate economy, typically available a week before each FOMC meeting. Each Greenbook has a five-year delay in its public release, suggesting that only ex-post analysis of the Taylor rule is empirically possible. Notably, our paper has a different objective, as we are interested in whether recent past local inflation in voting versus non-voting districts affect FOMC decisions. Moreover, to the best of our knowledge, there is no local economic projection data reflecting each Federal Reserve president's beliefs, surveyed before each FOMC meeting, that is publicly available at the district level.

We estimate the following specification:

$$\Delta FFR_m = \alpha + \beta_1 Infl_{m,t-1}^{Vote} + \beta_2 Infl_{m,t-1}^{NoVote} + \sum_{k=1}^{K} \tau_k FFR_{m-k} + \boldsymbol{\delta X_m} + \varepsilon_m, \qquad (4)$$

where as before ΔFFR_m is the change in the Federal funds target rate from meeting $m-1$ to meeting m. Most of the variables are as explained in Section 3.1.2. $\boldsymbol{X_m}$ denotes the set of control variables, including U.S. inflation and the Greenbook forecasts. We

[24] There exists an extensive body of literature that focuses on identifying other determinants to help improve the predictive power of the reduced-form Taylor rule model. For instance, Clarida, Gali, and Gertler (2000) (and many papers around the same time, such as Rudebusch (2002)) document that current interest rate decisions can be closely predicted by recent lagged interest rate(s). Romer and Romer (2000) document that Greenbook (also known as the Tealbook) forecasts of changes in price level and real income or productivity at the aggregate level systematically outperform forecasts by professional forecasters. Coibion and Gorodnichenko (2012)'s empirical framework, which incorporates both aforementioned important findings, is commonly used by researchers as the state-of-the-art empirical framework for testing the monetary policy consequences of new determinants, such as financial instability and stock market behaviors (see, e.g., Cieslak and Vissing-Jorgensen (2021)).

allow for interest rate smoothing (lagged FFR terms) up to the third order. The unit of observation is one FOMC meeting.

Table 8 reports the results. In Column (1), we replicate the baseline aggregate framework using Greenbook variables as in Cieslak and Vissing-Jorgensen (2021).[25] In Column (2), we replace Greenbook forecasts with recent national inflation and find that it is a positive and significant predictor of changes in the FFR. Column (3) shows, however, that inflation in voting districts is a positive and significant determinant of changes in the FFR when we control for inflation in non-voting districts. Columns (5) through (7) show similar results in the robust inflation measurement sample. Columns (4) and (8) further show that when we control for national inflation, the effect of inflation in voting districts remains statistically significant in the robust inflation measurement sample only.

[Insert Table 8 here]

5.3. Implications for Capital Markets

In this section, we test whether inflation in voting districts affects Treasury and futures markets. We consider the changes in yields for 3-month, 1-year, 2-year, 5-year, and 10-year maturity Treasury bonds. Specifically, we regress changes in Treasury bond yield rates on recent inflation in voting districts and non-voting districts. We consider the changes in yields around the week of the FOMC meeting (week 0). Specifically, $\Delta yield_{(-4,h)}$ denotes the yield difference from 4 weeks prior to the meeting to h week. Yield (and hence the level difference) is in units of percent per annum.

Table 9 reports the results. In Panel A, we use inflation in voting and non-voting districts as we do in demonstrating the main decomposition result. The results indicate a robust effect of inflation in voting districts on changes in Treasury yields from 4 weeks prior to the FOMC meeting.[26] For instance, estimates in Column (4) indicate that inflation in voting districts has a positive and significant affect on changes in yields. In terms of economic magnitude, a one SD increase in voting district inflation leads to a 13.4 bps or 0.35 SD increase in the yield change for 1-year maturity Treasury bonds. The economic magnitude decreases mostly monotonically with maturity, i.e., from 3m (0.40 SD) to 10y (0.31 SD) Treasury yields, which is expected as the channel is the

[25] In our replication of Table 4, Column (2) from Cieslak and Vissing-Jorgensen (2021), using the same 1994-2008 sample and our dataset, our coefficient estimate is 0.089*** (SE=0.011) for the Greenbook real GDP growth forecast (compared to 0.084 in their estimation), and 0.105*** (SE=0.021) for the Greenbook national inflation forecast (compared to 0.14 in their estimation). Both estimates are within 95% confidence intervals of the estimates in their paper.

[26] The results below are not sensitive to the starting week choice in terms of week -4, -3, or -2.

pure interest rate channel (instead of a risk premium channel). When we consider various horizons across columns, it is interesting that the effect already begins to peak and becomes statistically significant one week prior to FOMC meetings. This is an indication that the market already seems to price voting district inflation in prior to the meeting.

[Insert Table 9 here]

In Panel B, we use national inflation and inflation in voting districts. That is, we assess whether inflation in voting districts has explanatory power above and beyond national inflation. Coefficients for inflation in voting districts are similar to the coefficients in Panel A and remain positive and significant. In Panels C and D we repeat the analyses using the robust inflation measurement sample and find qualitatively similar results. Overall, the results provide clear evidence that the interaction of local inflation with the FOMC voting structure has a significant effect on Treasury yields.

We also see evidence from Table 9, Column (3) that is potentially consistent with market participants predicting this effect, which raises the possibility that market participants realize that inflation rates in voting districts have a significant effect on the FFR and have been gradually pricing them into the Treasury market. Next, we formally test this hypothesis using futures market data. If market participants understand that the decisions of FOMC members depend partly on inflation in voting districts, the relationship between FF futures rates and districts' inflation should be stronger for voting districts than for non-voting districts. A similar prediction applies if market participants follow comments about inflation made by voting FOMC members. To perform this test, we replace changes in Federal funds rates from last meeting $m-1$ to this meeting m in our regression (1) with changes in the average Federal funds futures rate, Δf_m. As mentioned earlier, the sample of this variable runs from 1989 to 2019 (see detailed descriptions in Section 3 and Internet Appendix Section IA.4).

The results are reported in Table 10. Column (1) shows that the previous 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 those 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 0.30 SD or 10.4 basis point increase in Δf_m, significant at the 5% level. In Column (3), we show that the voting effect in market expectations of the FFR remains positive and significant after controlling for national inflation. Further, when we focus on the robust inflation measurement sample in Columns (4) through (6), the results are qualitatively unchanged.

[Insert Table 10 here]

Overall, our results indicate that voting districts' inflation has a profound effect on Treasury markets and that investors realize the importance of disaggregating national inflation and taking into account the governance structure of the FOMC.

5.4. 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 of voting rights to five out of twelve Reserve Banks. In this section, we conduct two analyses to demonstrate the economic magnitude of the distortions in question and then explore two specific counterfactuals.

We begin by investigating how large the potential distortion could be. To simplify the message, we consider two extreme counterfactual cases. The first counterfactual case, Min(4), creates an inflation series that uses the four lowest inflation values across the eleven Reserve Bank districts to generate a voting-group average (New York's president always votes). That is, in this exercise we reallocate the voting rights of the four rotating districts to the four districts with the lowest inflation rates. The second counterfactual case, "Max(4)," always uses the largest four inflation numbers.

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

[Insert Figure 7 here]

While the analysis in Figure 7 implies that a distortion to ΔFFR can be large, there is a possibility that these distortions could cancel out as one looks at the path of FFR targets. As a result, we study two specific counterfactual cases and trace out their implied FFR target rates. 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.[27] The Banking Act of 1935

[27] See https://www.federalreservehistory.org/essays/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*. In that counterfactual, FOMC decisions are based on the equal-weighted inflation rates of all twelve districts. We fix the other coefficient estimates and other data inputs of the estimated regression, and replace the actual voting district inflation series with the counterfactual series. The counterfactual path of ΔFFR can be computed, and as a result, the target rate can be computed. For the subsample with lower inflation dispersion, we set the counterfactual path of ΔFFR to be the actual ΔFFR. Therefore, there is no distortion accumulation during that subsample. We also consider a second counterfactual case in which all districts have a voting right, but their voting power is proportional to the district's size (as measured by personal income levels).

Figure 8 presents the results. The time series in this plot are the difference between the counterfactual target rate series and the actual target rate series, expressed in basis points. Flat lines are low-dispersion periods, as changes in the FFR are simply replaced by (hence equal to) actual values. The equal-weighted counterfactual series (solid green line with crosses) shows that the path of the target rate would have been different if all districts affected FOMC decisions equally. For instance, the results suggest that target rates would have been higher during the pre-Global Financial Crisis period (2000-2005) if inflation in all districts had been taken into account equally. Importantly, the results show that voting-related distortions to FOMC decisions do not cancel out after two or three years. The size-weighted counterfactual series (solid blue line with diamonds) also indicates large distortions to the target rate series. Interestingly, equal-weighted and size-weighted counterfactual series sharply diverge during the post-1985 period. This finding is consistent with the dramatic shift in the geographical allocation of economic activity across districts, such as the rise of the San Francisco district, making the century-old district map outdated (Figure 1).

[Insert Figure 8 here]

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.

5.5. Revisiting the Voting Structure of the FOMC

There are two primary ways to shift monetary policy to better reflect national inflation. First, FOMC decision makers could change their behavior and place a greater emphasis on inflation, rather than inflation in voting districts only. Since agents respond to incentives and this approach does not lead to a change in incentives, the likelihood that this would be effective is unclear. That is, as long as regional presidents care about inflation in their districts and only some presidents vote, distortions in FOMC decisions are likely to persist.

Alternatively, policymakers could change the voting structure of the FOMC, either by giving voting rights to all Reserve Bank presidents or by removing those rights from all presidents so that only governors vote. While both approaches reduce the likelihood that a small group of presidents has disproportionate voting power, they have shortcomings. Allocating (equal) voting rights to all presidents and governors could marginalize the role of governors (7 governors versus 12 reserve bank presidents). Allocating voting rights to governors only could reduce reserve bank presidents' interest in the FOMC because they would have no formal influence on FOMC decisions.

In addition to the question of how to allocate votes across districts, the results in this paper call into question whether district boundaries are up to date. Consider, for instance, the California and St. Louis districts. The large (small) geographical area covered by the California (St. Louis) district likely represents the extent of its economic activity at the time when the map was designed, i.e., about a century ago. Since the geographical allocation of economic activity in the U.S. has dramatically changed during that century, allocating votes equally across districts would lead to an unequal allocation of votes across units of economic activity. Indeed, the large difference between equal-weighted and size-weighted counterfactual values in Figure 8 suggests that that mismatch is non-trivial.

6. Conclusion

In this paper, we show that during periods of high dispersion in inflation rates across districts, inflation in Reserve Bank districts affects the FFR only when those Banks' presidents hold voting seats at FOMC meetings. To provide more direct evidence of this voting mechanism, we use a hand-collected dataset that tracks the voting decisions of each FOMC member to show that voting presidents dissent based on inflation in their districts. Moreover, Reserve Bank presidents' districts are more likely to be mentioned and favored in discussions than are the districts of non-voting presidents according to FOMC transcripts. In terms of economic significance, the economic conditions in voting districts are a significant source of Romer-Romer monetary policy shocks, affect Taylor rule regressions, and have a profound effect 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.

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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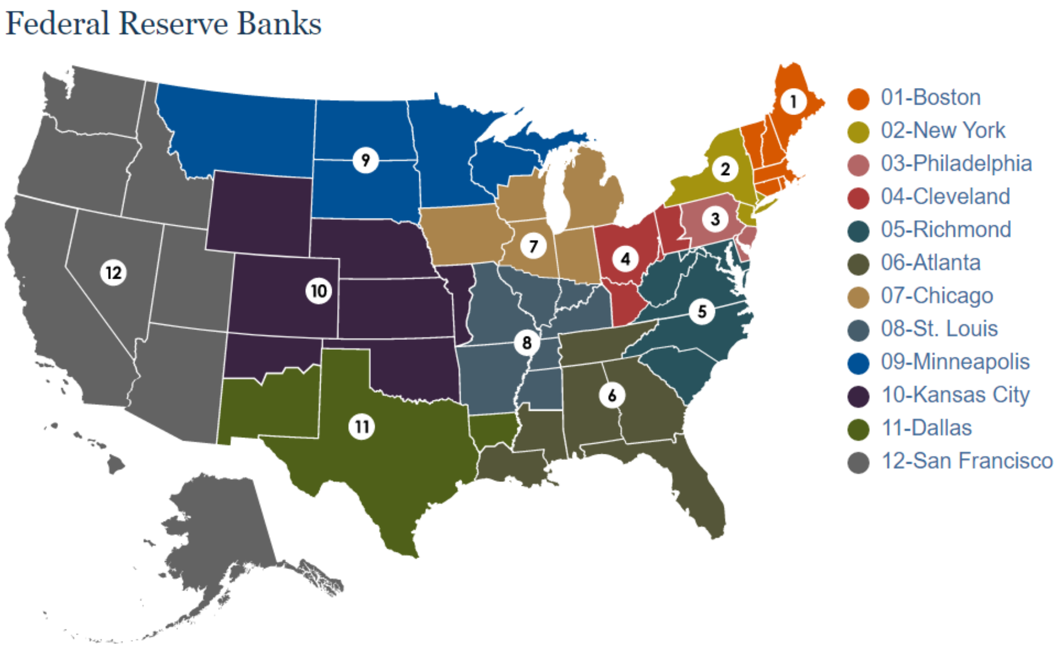

Figure 1: **Federal Reserve Banks.** Source: https://www.federalreserve.gov/aboutthefed/structure-federal-reserve-banks.htm

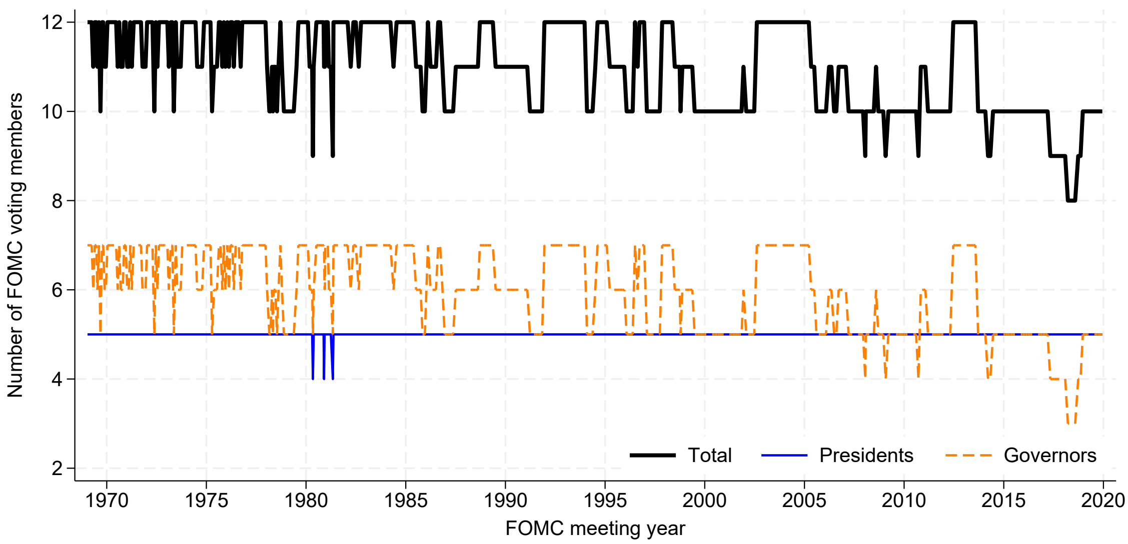

Figure 2: **Number of voting members at FOMC meetings from 1969 to 2019.**

Figure 3: **Rolling correlation between voting and non-voting district inflation rates.** In this figure we report the time series of rolling correlation between voting and non-voting district inflation rates. The rolling window uses 50 FOMC meetings, and the figure presents rolling correlations starting on 1/14/1969 and ending on 12/11/2019.

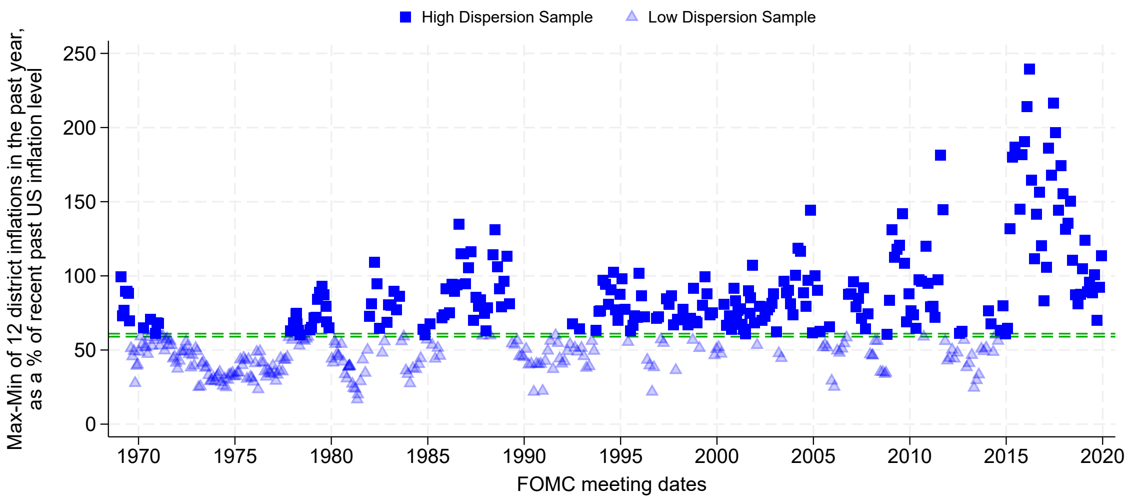

Figure 4: **Local inflation dispersion.** This figure shows the time series of the inflation dispersion indicator under the robust inflation measurement sample. It is the max-min spread of 12 district inflation rates in the past year, scaled by the recent past (3-year) U.S. inflation level. The two dashed lines indicate the 50th cutoff under the full time-series and no-ZLB sample. The plot using the baseline sample is relegated to Figure IB.1 in the Internet Appendix.

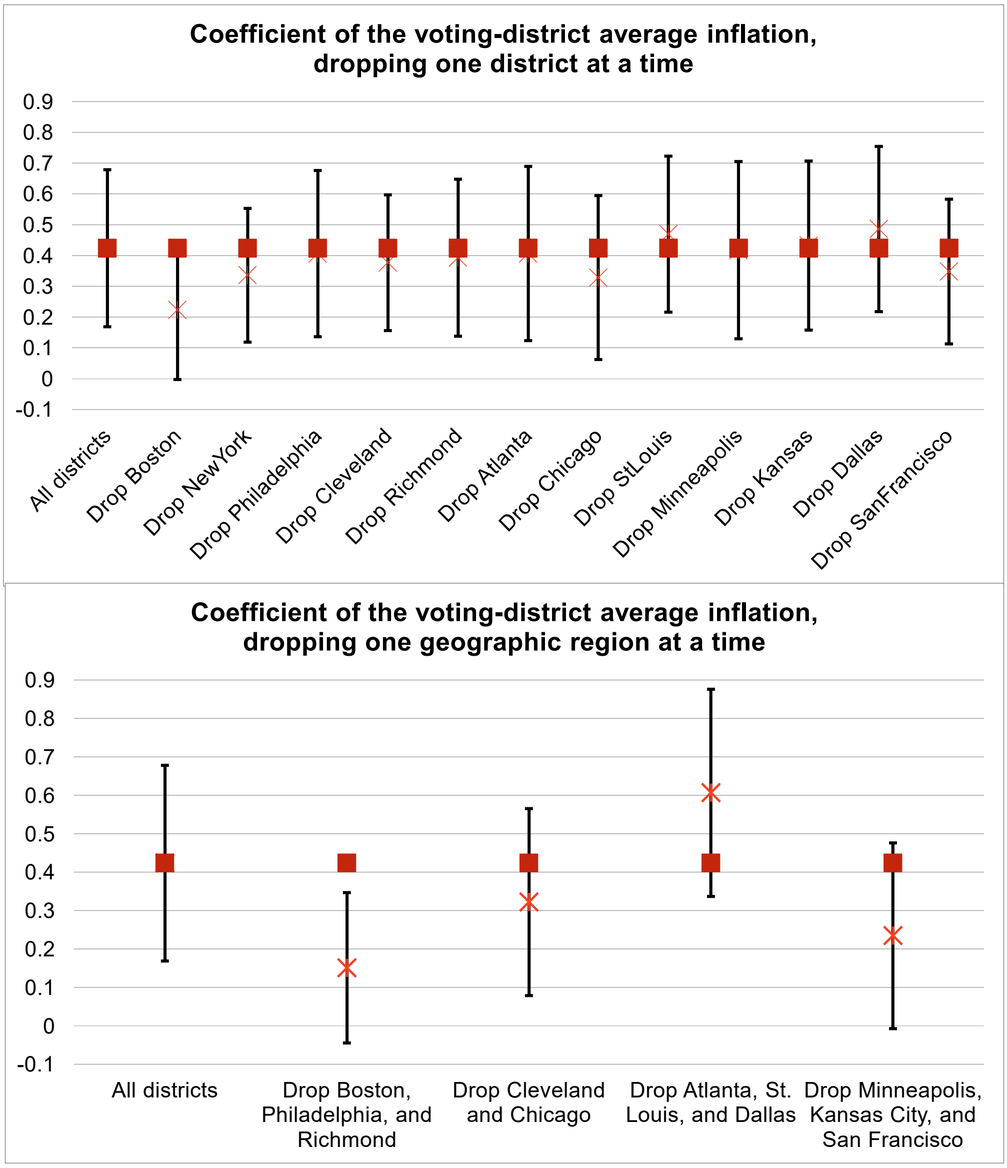

Figure 5: **Robustness test: The role of individual districts and geographical groups.** In this figure we report the coefficients of $Infl^{Vote}_{m,t-1}$ in the specification of Column (6) in Table 3's Panel B (i.e., the robust inflation measurement subsample with no zero lower bound and high inflation dispersion) while dropping one district at a time when constructing the voting and non-voting district macro variables. We drop one district from the entire analysis, whether it is a voting district or not. Coefficient estimates of $Infl^{Vote}_{m,t-1}$ dropping one district at a time are displayed in the top plot, and those dropping one geographical group at a time are displayed in the bottom plot. The "x" marker indicates the coefficient estimate and the bands indicate a 90% confidence interval. The square market indicates the 0.4235*** coefficient estimate of the baseline model, which includes all districts in the analysis.

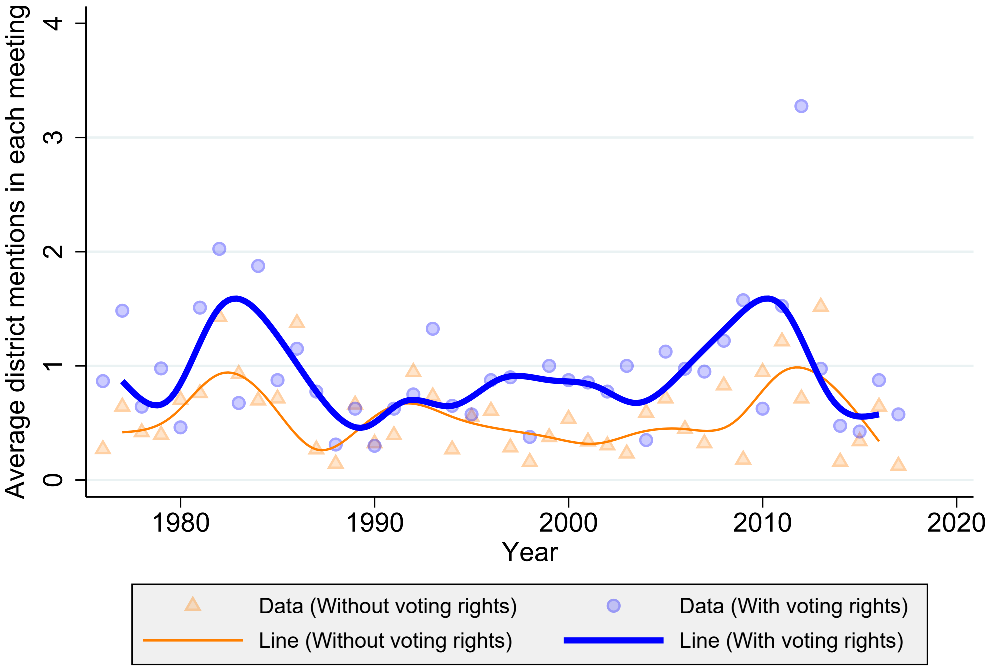

Figure 6: **Mentions of voting districts and non-voting districts by governors.** We search words spoken by governors for district keywords (mentions). Mentions of voting districts' keywords are significantly higher than those of non-voting districts' keywords, with a p-value of 0.0000 in a one-sided paired t-test. Regressions are presented in Table 6, Panel A, Column (2).

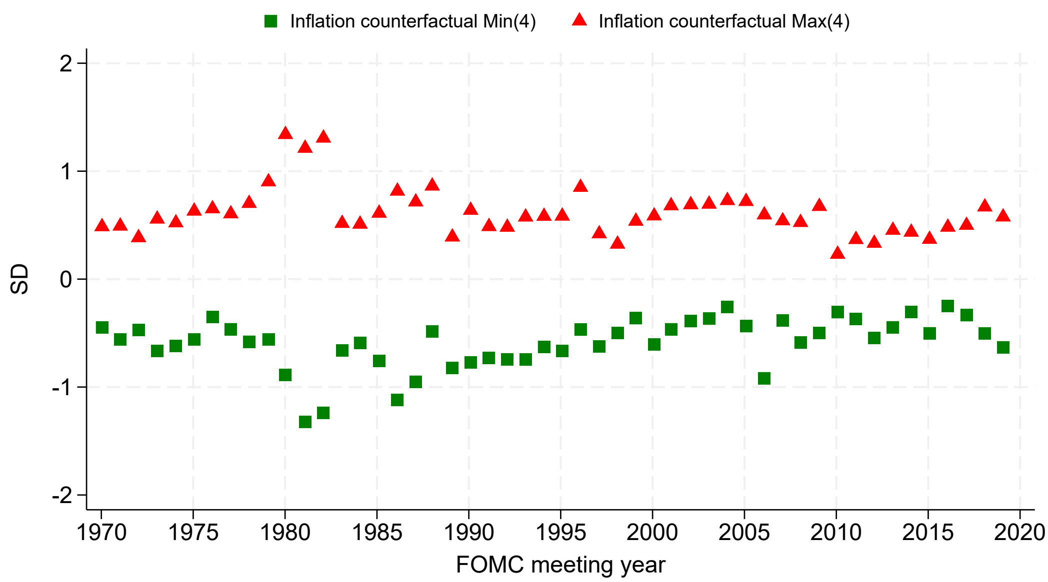

Figure 7: **The economic magnitude of extreme counterfactuals.** This figure demonstrates the economic magnitude of two extreme counterfactual cases. In the Min(4) (Max(4)) case, we assume that votes are allocated to the four out of 11 districts (without New York) with the lowest (highest) inflation 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.

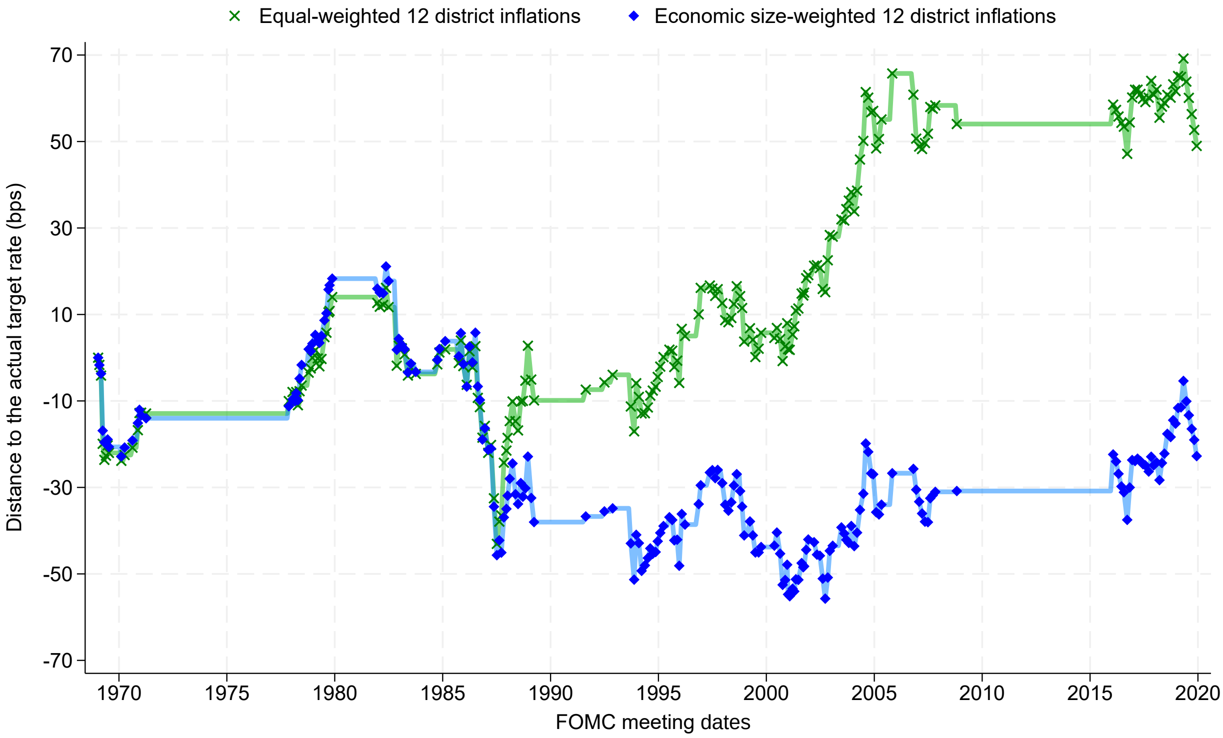

Figure 8: **Counterfactual minus actual paths of target rates.** This figure demonstrates what the path of the target rate would have looked like if decisions relied on one of two alternative voting inflation rates: (1) the equal-weighted average of all twelve districts' inflation rates and (2) the economic size-weighted average of all twelve districts, where district economic size is based on quarterly personal income. The time series above displays the counterfactual target rate series *minus* the actual target rate series, expressed in basis points. Here are the specific steps to obtain counterfactual target rates over time (denoted as $\overline{FFR}_m$). **{Case 1.}** During the period *outside* our no ZLB x high-dispersion subsample, we use the actual ΔFFR_m to compute $\overline{FFR}_m$, given $\overline{FFR}_{m-1}$ from the last meeting. **{Case 2.}** During the no ZLB x high-dispersion subsample, we use coefficients from Column (6) in Table 3's Panel B and replace the actual voting-group inflation rates with a counterfactual case to compute a $\Delta\overline{FFR}_m$. Then, we use the counterfactual $\Delta\overline{FFR}_m$ to compute $\overline{FFR}_m$, given $\overline{FFR}_{m-1}$ from the last meeting. **{More technical notes:}** $\Delta\overline{FFR}_m$ is not the fitted part from regression (6) in Table 3, Panel B, as we also need to add back the part of ΔFFR_m that cannot be explained by the model as it is. In addition, $\Delta\overline{FFR}_m$ also loads on the target rate from the previous meeting $(m-1)$ in this counterfactual computation, where $m-1$ could be under Case 1 or Case 2. That is why such counterfactual target rates are computed iteratively, i.e., one period at a time.

Table 1: **Actual vs. by law voting scheme.** This table 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. Columns (3) and (4) replicate (1) and (2), respectively, excluding the zero lower bound (ZLB) period from December 2008 to December 2015. The last two rows report the number of mismatches between actual voting and federal-law-determined voting, divided by the total number of meeting-districts. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	$ActualVote^i_m$			
Sample:	1969-2019		1969-2019, No ZLB	
	(1)	(2)	(3)	(4)
$ByLawVote^i_m$	0.9278***	0.9147***	0.9180***	0.9033***
	(0.005)	(0.006)	(0.006)	(0.007)
Constant	0.0179***	0.0179***	0.0205***	0.0205***
	(0.002)	(0.002)	(0.003)	(0.003)
N	5664	5192	4980	4565
R^2	0.87	0.85	0.85	0.83
F-statistic	32,380.6	22,285.3	24,796.9	17,073.3
Drop NY District:		X		X
% Mismatches with 1942 and alternate member schemes	1.0%	1.1%	1.2%	1.3%

Table 2: **Can districts' economic conditions predict the allocation of voting rights?** This table is a placebo test which projects whether a district's president voted (yes=1; no=0) in next year's meetings on its past economic conditions. We estimate the following regression: $Vote_{i,\tau} = \alpha + \beta_1 Inf_{i,q4(\tau-1)}(Inf_{i,\tau-1}) + \varepsilon_{r,\tau}$, where $Vote_{i,\tau}$ is an indicator of whether the representative of district i votes during year τ, $Inf_{i,q4(\tau-1)}$ is district i's inflation rate during the fourth quarter that precedes year τ (in quarterly percent), and $Inf_{i,\tau-1}$ is district i's inflation rate during last year $\tau - 1$ (in annual percent). The unit of observation is district-year, and therefore, N=612, 51 years $\times$ 12 districts. We consider the full time-series sample and the sample without zero lower bound years. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	Voting Indicator			
Sample:	1969-2019		1969-2019, No ZLB	
	(1)	(2)	(3)	(4)
Q4 Inflation	0.0127		0.0159	
	(0.018)		(0.022)	
Last year Inflation		0.0105		0.0087
		(0.007)		(0.007)
Constant	0.4644***	0.4302***	0.4688***	0.4419***
	(0.021)	(0.031)	(0.025)	(0.036)
N	612	612	528	528
R^2	0.00079	0.0042	0.00098	0.0029

Table 3: **Predicting changes in Federal funds rates.** This table presents estimates of regression (1), in which we regress changes in the FFR on recent inflation variables for voting and non-voting districts. The unit of observation is one FOMC meeting. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. Appendix Table A1 presents summary statistics of this regression. Panel A reports the results for the full time-series sample (1969-2019). Panel B reports the results for the sample that excludes the zero lower bound (ZLB) period from December 2008 to December 2015. Columns (5) and (6) are referred to as main results. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m					
High $Infl$ dispersion (>50th) sample:	No	Yes	Yes	No	Yes	Yes
Robust Inflation Measurement sample:	No	No	Yes	No	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Full time-series sample						
$Infl^{US}_{m,t-1}$	0.2579**	0.3772***	0.4097***			
	(0.129)	(0.098)	(0.096)			
$Infl^{Vote}_{m,t-1}$				0.1502	0.3111**	0.3042**
				(0.291)	(0.134)	(0.135)
$Infl^{NoVote}_{m,t-1}$				0.1127	0.0730	0.1130
				(0.329)	(0.140)	(0.138)
FFR_{m-1}	-0.0253*	-0.0035	-0.0083	-0.0256*	-0.0043	-0.0090
	(0.013)	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)
Constant	0.0391	-0.0473	-0.0429	0.0392	-0.0435	-0.0406
	(0.065)	(0.043)	(0.043)	(0.066)	(0.044)	(0.043)
N	471	235	235	471	235	235
R^2	0.017	0.083	0.088	0.018	0.088	0.092
Panel B: Exclude Zero Lower Bound						
$Infl^{US}_{m,t-1}$	0.2828*	0.4521***	0.5134***			
	(0.160)	(0.124)	(0.127)			
$Infl^{Vote}_{m,t-1}$				0.1861	0.3994**	0.4235***
				(0.316)	(0.155)	(0.155)
$Infl^{NoVote}_{m,t-1}$				0.1032	0.0692	0.1053
				(0.354)	(0.155)	(0.153)
FFR_{m-1}	-0.0310*	-0.0061	-0.0136	-0.0314*	-0.0078	-0.0152
	(0.017)	(0.014)	(0.015)	(0.017)	(0.014)	(0.015)
Constant	0.0746	-0.0568	-0.0450	0.0752	-0.0487	-0.0389
	(0.096)	(0.066)	(0.066)	(0.098)	(0.067)	(0.067)
N	414	206	206	414	206	206
R^2	0.018	0.086	0.095	0.019	0.092	0.10

Table 4: **Alternative inflation measures.** This table presents estimates of regression (1), in which we regress changes in the FFR on recent macro variables for voting and non-voting districts. This table focuses on the no ZLB x high inflation dispersion sample and is based on Columns (5) and (6) of Panel B in Table 3. The unit of observation is one FOMC meeting. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. In Column (1), we repeat the results from the main specification. In Column (2), we use the main-MSA district inflation measure. In Column (3), we use an inflation measure using strictly historical data relative to the FOMC meeting; we discuss this in detail in Section 3.1.2. In Column (4), we use a measure that captures the past 3-month inflation rate. All inflation units are in monthly percent. Panel A uses the baseline sample; Panel B uses the robust inflation measurement sample. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m			
$Infl$ measure:	Base result	Main MSA	FOMC Timing	3-month
	(1)	(2)	(3)	(4)
Panel A Baseline sample.				
$Infl^{Vote}_{m,t-1}$	0.3994**	0.4696***	0.3154**	0.4232*
	(0.155)	(0.164)	(0.141)	(0.232)
$Infl^{NoVote}_{m,t-1}$	0.0692	0.0282	0.1626	0.1397
	(0.155)	(0.153)	(0.164)	(0.261)
FFR_{m-1}	-0.0078	-0.0251	-0.0096	-0.0096
	(0.014)	(0.017)	(0.014)	(0.015)
Constant	-0.0487	0.0231	-0.0441	-0.0731
	(0.067)	(0.070)	(0.066)	(0.070)
N	206	206	206	206
R^2	0.092	0.098	0.091	0.089
Panel B. Robust Inflation Measurement sample.				
$Infl^{Vote}_{m,t-1}$	0.4235***	0.4402***	0.3158**	0.4370*
	(0.155)	(0.160)	(0.142)	(0.239)
$Infl^{NoVote}_{m,t-1}$	0.1053	0.0649	0.2341	0.1789
	(0.153)	(0.155)	(0.165)	(0.256)
FFR_{m-1}	-0.0152	-0.0250	-0.0174	-0.0172
	(0.015)	(0.017)	(0.015)	(0.016)
Constant	-0.0389	0.0175	-0.0362	-0.0597
	(0.067)	(0.070)	(0.066)	(0.070)
N	206	206	206	206
R^2	0.10	0.099	0.10	0.089

Table 5: **Dissent decisions.** This table presents the results of regressing an indicator of voting dissent on a president's corresponding (local) macro variables at the meeting-voter level using our main sample (1969-2019) that is consistent with the main specification in Table 3. Voting dissent is a vote against the decision at the end of the meeting. $Dissent^i_m$ equals 1 if the voter dissented and 0 otherwise. Other detailed variable summary statistics can be found in Appendix Table A2. Dissent data collection and local macro variable construction are explained in detail in Section 3 and Internet Appendix IA.3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:				$Dissent^i_m$				
Region FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Person FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meeting FE	No	No	No	Yes	No	No	No	Yes
Robust Inflation Measurement sample:	No	No	No	No	Yes	Yes	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Infl^i_{m,t-1}$		0.0316**	0.0472**	0.0229		0.0320**	0.0645***	0.0411*
		(0.015)	(0.023)	(0.023)		(0.015)	(0.023)	(0.024)
$Infl^{US}_{m,t-1}$	0.0187		-0.0287		0.0059		-0.0593*	
	(0.021)		(0.033)		(0.021)		(0.033)	
Constant	0.0771***	0.0724***	0.0773***	0.0756***	0.0792***	0.0696***	0.0796***	0.0663***
	(0.009)	(0.007)	(0.009)	(0.010)	(0.009)	(0.007)	(0.010)	(0.010)
N	2119	2119	2119	2119	2066	2066	2066	2066
R^2	0.17	0.17	0.17	0.42	0.17	0.17	0.17	0.43

Table 6: **FOMC meeting attention.** 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. For each meeting, there are 12 data points representing the 12 districts, bringing the total N to 4,380 (365×12). We construct seven samples 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. 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 7: **Implications: Monetary policy shocks.** This table presents the regression results of predicting the difference between the actual FFR decision and the proposed FFR decision using recent macro variables for the U.S., voting districts, and non-voting districts. This table focuses on the no ZLB x high inflation dispersion sample and is based on Columns (5) and (6) of Panel B in Table 3. $DTARG_m$ is the difference between the actual FFR decision and the proposed FFR decision going into meeting m, which is a concept first raised and measured in Romer and Romer (2004). We obtain the 1969-1996 series from Romer and Romer (2004) and the 1997-2007 series from Wieland and Yang (2020) who publish their replication work and extended dataset at `https://www.openicpsr.org/openicpsr/project/135741/version/V1/view`. The unit of observation is one FOMC meeting. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. Appendix Table A3 presents summary statistics of variables in this regression. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	Romer-Romer MP Shocks, $DTARG_m$					
Robust Inflation Measurement sample:	No	No	No	Yes	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
$Infl^{US}_{m,t-1}$	0.2693**		-0.0006	0.3231**		0.1018
	(0.128)		(0.238)	(0.129)		(0.230)
$Infl^{Vote}_{m,t-1}$		0.2782**	0.2838		0.2599*	0.2308
		(0.139)	(0.211)		(0.135)	(0.202)
$Infl^{NoVote}_{m,t-1}$		0.0059			0.0754	
		(0.139)			(0.134)	
FFR_{m-1}	-0.0102	-0.0121	-0.0121	-0.0136	-0.0148	-0.0148
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Constant	-0.0074	0.0018	0.0022	-0.0070	-0.0019	-0.0009
	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)
N	173	173	173	173	173	173
R^2	0.045	0.052	0.052	0.065	0.070	0.069

Table 8: **Implications: The Taylor rule.** This table estimates a variant of a generic Taylor rule (as in Cieslak and Vissing-Jorgensen (2021)) augmented by our voting and non-voting district macro variables. This table focuses on the no ZLB x high inflation dispersion sample and is based on Columns (5) and (6) of Panel B in Table 3. Given that Greenbooks are released to the public with a 5-year delay, our sample period for this analysis ends in 2017. We follow Cieslak and Vissing-Jorgensen (2021) and use $E_m(Infl_{q1})$ (one-quarter-ahead forecast of GDP deflator inflation) and $E_m(gGDP_{q0})$ (current-quarter nowcast of real GDP growth). The unit of observation is one FOMC meeting. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:				ΔFFR_m				
Robust Inflation Measurement sample:	No	No	No	No	Yes	Yes	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$E_m(Infl_{q1})$	0.0844***			0.0574**	0.0915***		0.0577**	0.0581**
	(0.032)			(0.027)	(0.031)		(0.026)	(0.026)
$E_m(gGDP_{q0})$	0.0247	0.0171	0.0150	0.0176	0.0219	0.0095	0.0135	0.0135
	(0.032)	(0.034)	(0.034)	(0.033)	(0.033)	(0.035)	(0.033)	(0.033)
FFR_{m-1}	0.0241	0.0767	0.0697	0.0260	0.0618	0.1163	0.0641	0.0638
	(0.092)	(0.095)	(0.094)	(0.092)	(0.144)	(0.141)	(0.140)	(0.140)
FFR_{m-2}	-0.0252	-0.0839	-0.0653	-0.0327	-0.0933	-0.1448	-0.1012	-0.1001
	(0.162)	(0.162)	(0.168)	(0.166)	(0.211)	(0.209)	(0.209)	(0.209)
FFR_{m-3}	-0.0271	0.0031	-0.0107	-0.0224	-0.0075	0.0118	-0.0018	-0.0027
	(0.132)	(0.130)	(0.135)	(0.134)	(0.133)	(0.136)	(0.135)	(0.135)
$Infl^{Vote}_{m,t-1}$			0.3957**	0.3905		0.4368**	0.3899**	0.4271*
			(0.180)	(0.260)		(0.179)	(0.168)	(0.257)
$Infl^{NoVote}_{m,t-1}$			0.0605			0.0800	-0.0289	
			(0.157)			(0.161)	(0.163)	
$Infl^{US}_{m,t-1}$		0.4408***		-0.0913				-0.0690
		(0.155)		(0.266)				(0.271)
Constant	-0.1273*	-0.1072	-0.0908	-0.1051	-0.0972	-0.0540	-0.0750	-0.0744
	(0.065)	(0.068)	(0.071)	(0.068)	(0.074)	(0.079)	(0.075)	(0.075)
N	188	188	188	188	188	188	188	188
R^2	0.11	0.11	0.12	0.14	0.11	0.13	0.15	0.15

Table 9: **Implications: 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. This table focuses on the no ZLB x high inflation dispersion sample and is based on Columns (5) and (6) of Panel B in Table 3. 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. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. Appendix Table A3 presents summary statistics for this regression. To conserve space, we collapse the results from 160 regressions (8 horizons$\times$5 maturities$\times$4 panels) and report only the voting-group inflation coefficients and their standard errors in this table. In each $Infl^{Vote}_{m,t-1}$ row, 3m (1y, 2y, 5y, 10y) indicates the respective yield maturity. The extensive full tables are available upon request. Panels A and C control for non-voting measures, and Panels B and D control for national measures. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	$\Delta yield_{(-4,h)}$							
Horizon in weeks (-4,h)	(-4,-3)	(-4,-2)	(-4,-1)	(-4,0)	(-4,+1)	(-4,+2)	(-4,+3)	(-4,+4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Baseline sample. Controlling for non-voting measures								
$Infl^{Vote}_{m,t-1}$, 3m	0.1256	0.1434	0.3089**	0.5230***	0.4000**	0.4280**	0.4685**	0.4978**
	(0.081)	(0.097)	(0.130)	(0.173)	(0.189)	(0.207)	(0.203)	(0.237)
$Infl^{Vote}_{m,t-1}$, 1y	0.1407	0.1403	0.2825**	0.4480**	0.5234***	0.5240**	0.5427**	0.5394**
	(0.085)	(0.100)	(0.141)	(0.175)	(0.199)	(0.220)	(0.209)	(0.228)
$Infl^{Vote}_{m,t-1}$, 2y	0.1073	0.1107	0.2450*	0.3832**	0.4754**	0.4842**	0.5451***	0.4951**
	(0.093)	(0.114)	(0.148)	(0.179)	(0.203)	(0.214)	(0.209)	(0.223)
$Infl^{Vote}_{m,t-1}$, 5y	0.1058	0.0917	0.2194*	0.3590**	0.4251**	0.3783**	0.4415**	0.4009**
	(0.088)	(0.104)	(0.128)	(0.160)	(0.181)	(0.191)	(0.193)	(0.202)
$Infl^{Vote}_{m,t-1}$, 10y	0.0818	0.0971	0.2070*	0.3045**	0.3434**	0.3185*	0.3549**	0.3233*
	(0.076)	(0.093)	(0.118)	(0.146)	(0.158)	(0.162)	(0.174)	(0.180)
Panel B: Baseline sample. Controlling for national measures								
$Infl^{Vote}_{m,t-1}$, 3m	0.1145	0.1743	0.3819**	0.6396**	0.4806	0.5068	0.5824*	0.6408*
	(0.107)	(0.153)	(0.187)	(0.257)	(0.302)	(0.325)	(0.310)	(0.347)
$Infl^{Vote}_{m,t-1}$, 1y	0.1901	0.1923	0.4254**	0.6350**	0.7115**	0.6441*	0.6065*	0.5653
	(0.127)	(0.157)	(0.211)	(0.271)	(0.311)	(0.340)	(0.335)	(0.365)
$Infl^{Vote}_{m,t-1}$, 2y	0.1307	0.1229	0.3502	0.5136*	0.6208*	0.5429	0.6009*	0.4845
	(0.143)	(0.180)	(0.229)	(0.283)	(0.325)	(0.336)	(0.329)	(0.356)
$Infl^{Vote}_{m,t-1}$, 5y	0.1446	0.1001	0.3209	0.5036*	0.5872**	0.4089	0.4713	0.3755
	(0.140)	(0.166)	(0.205)	(0.257)	(0.298)	(0.310)	(0.314)	(0.330)
$Infl^{Vote}_{m,t-1}$, 10y	0.1216	0.1265	0.3095	0.4306*	0.4586*	0.3430	0.3771	0.2968
	(0.122)	(0.149)	(0.188)	(0.232)	(0.261)	(0.264)	(0.281)	(0.299)
Panel C: Robust Inflation Measurement sample. Controlling for non-voting measures								
$Infl^{Vote}_{m,t-1}$, 3m	0.1229	0.1275	0.3753**	0.5914***	0.4551**	0.4538**	0.4869**	0.5160**
	(0.081)	(0.097)	(0.146)	(0.187)	(0.192)	(0.203)	(0.199)	(0.237)
$Infl^{Vote}_{m,t-1}$, 1y	0.1217	0.0867	0.2815*	0.4376**	0.4828**	0.4533**	0.4496**	0.4380*
	(0.082)	(0.100)	(0.145)	(0.180)	(0.196)	(0.214)	(0.203)	(0.222)
$Infl^{Vote}_{m,t-1}$, 2y	0.1142	0.0862	0.2840*	0.4250**	0.5150**	0.5170**	0.5554***	0.5006**
	(0.094)	(0.117)	(0.152)	(0.183)	(0.201)	(0.210)	(0.203)	(0.218)
$Infl^{Vote}_{m,t-1}$, 5y	0.0866	0.0393	0.2193*	0.3395**	0.3917**	0.3330*	0.3597*	0.3113
	(0.084)	(0.104)	(0.126)	(0.157)	(0.175)	(0.184)	(0.187)	(0.194)
$Infl^{Vote}_{m,t-1}$, 10y	0.0608	0.0433	0.1979*	0.2674*	0.2988**	0.2634*	0.2663	0.2286
	(0.074)	(0.093)	(0.115)	(0.142)	(0.151)	(0.156)	(0.169)	(0.174)
Panel D: Robust Inflation Measurement sample. Controlling for national measures								
$Infl^{Vote}_{m,t-1}$, 3m	0.1163	0.1434	0.4530**	0.7055***	0.5398*	0.5156*	0.5792*	0.6445*
	(0.104)	(0.150)	(0.200)	(0.266)	(0.299)	(0.311)	(0.299)	(0.345)
$Infl^{Vote}_{m,t-1}$, 1y	0.1516	0.0923	0.3788*	0.5544**	0.5786*	0.4428	0.3710	0.3350
	(0.120)	(0.154)	(0.212)	(0.273)	(0.300)	(0.322)	(0.317)	(0.350)
$Infl^{Vote}_{m,t-1}$, 2y	0.1445	0.0871	0.3948*	0.5467*	0.6437**	0.5428*	0.5617*	0.4568
	(0.143)	(0.182)	(0.232)	(0.286)	(0.317)	(0.322)	(0.311)	(0.341)
$Infl^{Vote}_{m,t-1}$, 5y	0.1081	0.0119	0.2932	0.4285*	0.4915*	0.2886	0.2917	0.2015
	(0.132)	(0.160)	(0.196)	(0.248)	(0.282)	(0.292)	(0.299)	(0.316)
$Infl^{Vote}_{m,t-1}$, 10y	0.0833	0.0378	0.2698	0.3328	0.3500	0.2099	0.1901	0.1167
	(0.117)	(0.146)	(0.178)	(0.219)	(0.241)	(0.247)	(0.268)	(0.285)

Table 10: **Implications: Market expectations.** This table presents the regression results of predicting changes in investor expectations using recent macro variables for the U.S., voting districts, and non-voting districts. This table focuses on the no ZLB x high inflation dispersion sample and is based on Columns (5) and (6) of Panel B in Table 3. The main dependent variable is the change in the average implied Federal funds futures rate across various terms (source: Refinitiv DataStream). Data details can be found in Internet Appendix IA.4. The variables, the robust inflation measurement sample, and the meeting-level inflation dispersion measure are as defined in Sections 3.1.2 and 4.2. Appendix Table A3 presents summary statistics for this regression. We use the largest sample available until the end of the paper sample, 1989-2019. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	Changes in average FFF rates, Δf_m					
Robust Inflation Measurement sample:	No	No	No	Yes	Yes	Yes
	(1)	(2)	(3)	(4)	(5)	(6)
$Infl^{US}_{m,t-1}$	0.3786**		-0.0764	0.3816**		-0.1112
	(0.155)		(0.246)	(0.155)		(0.253)
$Infl^{Vote}_{m,t-1}$		0.4969**	0.4981*		0.5299**	0.5438*
		(0.214)	(0.277)		(0.223)	(0.291)
$Infl^{NoVote}_{m,t-1}$		-0.0817			-0.1041	
		(0.142)			(0.146)	
FFR_{m-1}	0.0028	-0.0016	-0.0011	0.0031	-0.0009	-0.0005
	(0.016)	(0.015)	(0.015)	(0.017)	(0.015)	(0.015)
Constant	-0.0713	-0.0536	-0.0573	-0.0747	-0.0601	-0.0636
	(0.084)	(0.078)	(0.079)	(0.084)	(0.079)	(0.080)
N	131	131	131	129	129	129
R^2	0.051	0.067	0.066	0.052	0.071	0.070

Appendix

Table A1: **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. As in the paper, each meeting has time stamp m and ΔFFR_m denotes the changes 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. Panels A1-A3 consider our full time-series sample from 1969 to 2019. Panels B1-B3 exclude the zero lower bound period. More specifically, Panel A1 here corresponds to Columns (1) and (2) in Panel A of Table 3; Panel A2: Columns (3) and(4); Panel A3: (5) and (6). Similar correspondence applies to both tables' Panel B. Sections 3.1.2, 4.2, Internet Appendix Section IA.1, and Table 3 provide more details about the data and constructions of variables presented here.

Symbol, Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel A1: 1969-2019 × Baseline sample (N=472)									
ΔFFR_m, FF Target Rate Change from $m-1$ to m	-0.01	0.64	-4.00	4.12	-0.75	-0.12	0.00	0.19	0.69
$Infl^{US}_{m,t-1}$, Inflation, US	0.35	0.34	-1.55	1.42	-0.12	0.14	0.32	0.53	0.97
$Infl^{Vote}_{m,t-1}$, Inflation, Voting District Average	0.35	0.35	-1.55	1.41	-0.17	0.14	0.32	0.54	0.99
$Infl^{NoVote}_{m,t-1}$, Inflation, Non-Voting District Average	0.36	0.35	-1.55	1.52	-0.15	0.14	0.33	0.54	0.96
Panel A2: 1969-2019 × Baseline sample × High Dispersion sample (N=236)									
ΔFFR_m	0.03	0.39	-1.00	3.00	-0.50	0.00	0.00	0.12	0.62
$Infl^{US}_{m,t-1}$	0.25	0.31	-1.55	1.24	-0.16	0.08	0.24	0.41	0.73
$Infl^{Vote}_{m,t-1}$	0.24	0.32	-1.55	1.22	-0.20	0.07	0.24	0.42	0.79
$Infl^{NoVote}_{m,t-1}$	0.25	0.32	-1.55	1.31	-0.17	0.08	0.25	0.43	0.74
Panel A3: 1969-2019 × Robust Inflation Measurement sample × High Dispersion sample (N=236)									
ΔFFR_m	0.02	0.41	-1.62	3.00	-0.50	0.00	0.00	0.12	0.62
$Infl^{US}_{m,t-1}$	0.24	0.32	-1.55	1.24	-0.24	0.08	0.24	0.41	0.73
$Infl^{Vote}_{m,t-1}$	0.24	0.33	-1.55	1.22	-0.21	0.05	0.23	0.41	0.79
$Infl^{NoVote}_{m,t-1}$	0.25	0.33	-1.55	1.31	-0.22	0.08	0.25	0.42	0.76
Panel B1: No ZLB × Baseline sample (N=415)									
ΔFFR_m	-0.01	0.68	-4.00	4.12	-0.75	-0.25	0.00	0.25	0.75
$Infl^{US}_{m,t-1}$	0.39	0.32	-0.44	1.42	-0.08	0.17	0.34	0.55	1.02
$Infl^{Vote}_{m,t-1}$	0.39	0.33	-0.45	1.41	-0.11	0.17	0.34	0.58	1.01
$Infl^{NoVote}_{m,t-1}$	0.39	0.33	-0.58	1.52	-0.07	0.17	0.36	0.57	0.97
Panel B2: No ZLB × Baseline sample × High Dispersion sample (N=207)									
ΔFFR_m	0.04	0.42	-1.00	3.00	-0.50	0.00	0.00	0.25	0.62
$Infl^{US}_{m,t-1}$	0.28	0.29	-0.44	1.24	-0.12	0.11	0.26	0.43	0.81
$Infl^{Vote}_{m,t-1}$	0.27	0.30	-0.43	1.22	-0.20	0.09	0.25	0.43	0.80
$Infl^{NoVote}_{m,t-1}$	0.29	0.30	-0.58	1.31	-0.17	0.12	0.27	0.45	0.86
Panel B3: No ZLB × Robust Inflation Measurement sample × High Dispersion sample (N=207)									
ΔFFR_m	0.03	0.44	-1.62	3.00	-0.50	0.00	0.00	0.25	0.62
$Infl^{US}_{m,t-1}$	0.28	0.29	-0.44	1.24	-0.14	0.11	0.26	0.43	0.81
$Infl^{Vote}_{m,t-1}$	0.28	0.30	-0.43	1.22	-0.20	0.09	0.25	0.43	0.81
$Infl^{NoVote}_{m,t-1}$	0.29	0.30	-0.58	1.31	-0.17	0.12	0.28	0.44	0.87

Table A2: **Summary statistics for panel variables.**

This table presents the summary statistics for the panel variables used for Tables 5 and 6. For those summary statistics that involve inflation, we report both baseline and robust inflation measurement sample statistics. Panels A and B correspond to the baseline and robust inflation measurement sample results as presented in Table 5, respectively. Panel C presents summary statistics for the panel variables in Table 6, where data are organized at the meeting-district level. Given that transcripts have a 5-year delay, the longest transcript sample we can obtain is from 4/20/1976 to 12/13/2017, a total of 365 meetings; hence, 4,380 = 365×12. $DistrictMentions_m^i$ 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. $TextualSimilarity_m^i$ is the cosine similarity score calculated between speech blocks from all governors and those from district i's president during meeting m. $SentimentCat_m^i$ is a categorical variable that equals 1 if governor sentiment towards district i is positive, -1 if negative, and 0 otherwise; $Sentiment_m^i$ 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. $Vote_m^i$ equals one if district i has voting rights during meeting m.

Symbol, Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel A: Dissent regression sample at the Meeting-Voting President level × Baseline sample (N = 2,119)									
$Dissent_m^i$, Dummy: Dissent=1	0.08	0.28	0	1	0	0	0	0	1
$Infl_{m,t-1}^i$	0.37	0.43	-2.08	2.25	-0.26	0.11	0.34	0.61	1.09
Panel B: Dissent regression sample at the Meeting-Voting President level × Robust Inflation Measurement sample (N = 2,066)									
$Dissent_m^i$, Dummy: Dissent=1	0.08	0.27	0	1	0	0	0	0	1
$Infl_{m,t-1}^i$	0.36	0.43	-2.08	2.25	-0.26	0.11	0.34	0.61	1.09
Panel C: Textual analysis sample at the Meeting-District level (N = 4,380)									
$DistrictMentions_m^i$, District mentions, Governors and Presidents	3.81	4.41	0	40	0	1	2	5	13
$DistrictMentions_m^i$, District mentions, Governors	0.73	1.56	0	23	0	0	0	1	4
$DistrictMentions_m^i$, District mentions, Governors-Chair	0.35	1.03	0	18	0	0	0	0	2
$DistrictMentions_m^i$, District mentions, Governors-Non-Chair	0.38	0.99	0	16	0	0	0	0	2
$DistrictMentions_m^i$, District mentions, Presidents	3.09	3.85	0	35	0	0	2	4	10
$DistrictMentions_m^i$, District mentions, Voting Presidents	1.26	2.48	0	30	0	0	0	1	6
$DistrictMentions_m^i$, District mentions, Non-voting Presidents	1.82	2.95	-7	30	0	0	1	2	8
$TextualSimilarity_m^i$, Governor speech similarity with District	0.22	0.36	0.00	0.96	0.00	0.00	0.00	0.52	0.90
$SentimentCat_m^i$, Category: =1 if Sentiment $>$ 0, =-1 if Sentiment $<$ 0, 0 otherwise	0.27	0.48	-1	1	0	0	0	1	1
$Sentiment_m^i$, Governor sentiment towards District	0.03	0.08	-1.00	0.70	0.00	0.00	0.00	0.05	0.15
$Vote_m^i$, Dummy: Voting=1	0.42	0.49	0	1	0	0	0	1	1

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 7, 9 and 10, focusing on the no ZLB × high dispersion sample as in these tables. $DTARG_m$ is the Romer and Romer (2004) monetary policy shock, capturing the difference between the intended or proposed Federal funds target rate and the actual one that is the outcome of the meeting. Romer and Romer (2004)'s original dataset ends in 1996; we then use published work and data by Wieland and Yang (2020) to obtain an extended series through the end of 2007. $\Delta yield_{(-4,h)}$ is the first difference between market Treasury yield rates by the ends of Week -4 (0=meeting week) and Week h. All horizons are obtained from FRED given the longest possible sample that overlaps with our sample (1969 for 1y, 5y, 10y; 1976 for 2y; 1981 for 3m). To conserve space, selected horizons are reported. Δf_m is the change in the average implied rates from Federal funds futures contracts. Data is obtained from Refinitiv DataStream, which is available since 1989. Units of all three variables are percent per annum.

Symbol, Variable	Mean (1)	SD (2)	Min (3)	Max (4)	5th (5)	25th (6)	50th (7)	75th (8)	95th (9)
Panel A: No ZLB × Baseline sample × High Dispersion sample									
$DTARG$, Romer and Romer (2004) Monetary Policy Shock	0.02	0.33	-0.75	3.00	-0.50	0.00	0.00	0.12	0.50
$\Delta yield3m_{(-4,-3)}$, 3m-Treasury Yield Change from -Week 4 to -Week 3	0.02	0.15	-0.63	0.81	-0.19	-0.04	0.01	0.05	0.28
$\Delta yield1y_{(-4,-3)}$, 1y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.18	-0.78	0.70	-0.26	-0.06	0.00	0.07	0.36
$\Delta yield2y_{(-4,-3)}$, 2y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.18	-0.66	0.58	-0.24	-0.08	0.01	0.10	0.36
$\Delta yield5y_{(-4,-3)}$, 5y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.18	-0.68	0.61	-0.28	-0.09	0.02	0.10	0.32
$\Delta yield10y_{(-4,-3)}$, 10y-Treasury Yield Change from -Week 4 to -Week 3	0.02	0.16	-0.52	0.50	-0.23	-0.08	0.02	0.11	0.31
$\Delta yield3m_{(-4,-1)}$	0.04	0.31	-0.87	2.09	-0.34	-0.09	0.02	0.13	0.47
$\Delta yield1y_{(-4,-1)}$	0.03	0.33	-0.80	1.69	-0.45	-0.11	0.01	0.17	0.56
$\Delta yield2y_{(-4,-1)}$	0.03	0.32	-0.89	1.43	-0.44	-0.13	0.02	0.16	0.56
$\Delta yield5y_{(-4,-1)}$	0.02	0.28	-0.84	1.04	-0.44	-0.14	0.01	0.16	0.53
$\Delta yield10y_{(-4,-1)}$	0.02	0.26	-0.79	0.91	-0.36	-0.14	0.02	0.18	0.51
$\Delta yield3m_{(-4,+1)}$	0.03	0.42	-1.22	3.09	-0.66	-0.13	0.03	0.17	0.54
$\Delta yield1y_{(-4,+1)}$	0.02	0.44	-1.68	2.00	-0.80	-0.17	0.01	0.22	0.63
$\Delta yield2y_{(-4,+1)}$	0.03	0.41	-1.54	1.74	-0.70	-0.22	0.02	0.25	0.75
$\Delta yield5y_{(-4,+1)}$	0.02	0.38	-1.55	1.04	-0.63	-0.22	0.00	0.23	0.71
$\Delta yield10y_{(-4,+1)}$	0.01	0.34	-1.64	0.89	-0.45	-0.19	0.00	0.21	0.64
$\Delta yield3m_{(-4,+3)}$	0.02	0.44	-1.28	2.63	-0.88	-0.15	0.02	0.20	0.67
$\Delta yield1y_{(-4,+3)}$	0.04	0.53	-1.80	2.26	-0.83	-0.16	0.00	0.26	0.85
$\Delta yield2y_{(-4,+3)}$	0.03	0.50	-1.82	1.95	-0.88	-0.19	0.00	0.23	0.79
$\Delta yield5y_{(-4,+3)}$	0.01	0.47	-1.60	1.70	-0.72	-0.23	0.01	0.27	0.76
$\Delta yield10y_{(-4,+3)}$	0.01	0.42	-1.66	1.42	-0.58	-0.22	0.00	0.23	0.76
Δf_m, FF Futures Change from $m-1$ to m	0.01	0.35	-2.13	1.03	-0.56	-0.12	0.01	0.17	0.52
Panel B: No ZLB × Robust Inflation Measurement sample × High Dispersion sample									
$DTARG$, Romer and Romer (2004) Monetary Policy Shock	0.01	0.34	-0.75	3.00	-0.50	0.00	0.00	0.12	0.50
$\Delta yield3m_{(-4,-3)}$, 3m-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.15	-0.63	0.81	-0.20	-0.05	0.01	0.05	0.28
$\Delta yield1y_{(-4,-3)}$, 1y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.19	-0.78	0.70	-0.26	-0.06	0.00	0.07	0.35
$\Delta yield2y_{(-4,-3)}$, 2y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.18	-0.66	0.58	-0.25	-0.08	0.01	0.10	0.36
$\Delta yield5y_{(-4,-3)}$, 5y-Treasury Yield Change from -Week 4 to -Week 3	0.01	0.18	-0.68	0.61	-0.28	-0.09	0.02	0.10	0.34
$\Delta yield10y_{(-4,-3)}$, 10y-Treasury Yield Change from -Week 4 to -Week 3	0.02	0.16	-0.52	0.50	-0.23	-0.08	0.02	0.11	0.32
$\Delta yield3m_{(-4,-1)}$	0.03	0.34	-1.42	2.09	-0.36	-0.10	0.02	0.13	0.47
$\Delta yield1y_{(-4,-1)}$	0.03	0.34	-0.99	1.69	-0.47	-0.11	0.01	0.16	0.56
$\Delta yield2y_{(-4,-1)}$	0.02	0.33	-0.89	1.43	-0.48	-0.13	0.00	0.16	0.56
$\Delta yield5y_{(-4,-1)}$	0.02	0.29	-0.84	1.04	-0.46	-0.14	0.01	0.16	0.53
$\Delta yield10y_{(-4,-1)}$	0.02	0.27	-0.79	0.91	-0.36	-0.15	0.02	0.18	0.51
$\Delta yield3m_{(-4,+1)}$	0.02	0.44	-1.40	3.09	-0.73	-0.13	0.03	0.17	0.54
$\Delta yield1y_{(-4,+1)}$	0.02	0.44	-1.42	2.00	-0.81	-0.18	0.01	0.22	0.63
$\Delta yield2y_{(-4,+1)}$	0.03	0.41	-1.01	1.74	-0.72	-0.23	0.02	0.25	0.75
$\Delta yield5y_{(-4,+1)}$	0.02	0.37	-1.10	1.04	-0.64	-0.22	0.00	0.23	0.71
$\Delta yield10y_{(-4,+1)}$	0.02	0.33	-0.84	0.89	-0.51	-0.19	0.00	0.21	0.64
$\Delta yield3m_{(-4,+3)}$	0.00	0.46	-1.56	2.63	-0.92	-0.19	0.02	0.20	0.67
$\Delta yield1y_{(-4,+3)}$	0.03	0.53	-1.42	2.26	-0.88	-0.17	-0.01	0.26	0.96
$\Delta yield2y_{(-4,+3)}$	0.03	0.50	-1.27	1.95	-0.90	-0.20	0.00	0.23	0.79
$\Delta yield5y_{(-4,+3)}$	0.01	0.47	-1.26	1.70	-0.76	-0.23	0.01	0.27	0.76
$\Delta yield10y_{(-4,+3)}$	0.01	0.41	-1.28	1.42	-0.64	-0.22	0.00	0.23	0.76
Δf_m, FF Futures Change from $m-1$ to m	0.01	0.35	-2.13	1.03	-0.56	-0.12	0.01	0.16	0.52

Internet Appendices for "Do the Voting Rights of Federal Reserve Bank Presidents Matter?"

IA. Data Appendix

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

IA.1. Local Inflation Measure

Sources. We first investigate Reserve Banks' websites and data archives, and find 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 turn 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 is 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. This is because inflation dispersion among districts at (preferably) FOMC meeting frequency is the wedge we want to exploit in this research. In addition, from an empirical practicality 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 data 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 below 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).

Inflation construction. The frequency of CPI data available for each district-time may be different. Most have CPI data for each month or every two months, and before 1978 we observe some trimonthly CPI measurements too. Given our research objective, we aim to construct monthly district-level inflation. We conduct three economically-motivated steps:

First, we convert each individual MSA-level CPI-U series into monthly frequency and unit. That is, for a monthly CPI series, monthly inflation is the percentage change in CPI. For other frequencies, we first compute the percentage change between two consecutive CPI numbers, divide the percentage change by the number of months in the gap, and then backfill. For instance, if data available at a bimonthly frequency has a percentage change between March and May CPI values of 0.4%, we will fill April and May inflation rates with values of 0.2%. For the four districts with long periods of low-frequency data (Atlanta (1987-1997), St Louis (1998-2017), Minneapolis (1987-2017), and Kansas City (1987-2017)), to be conservative, we do not fill 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. For example, when Atlanta is represented (voting) in an FOMC meeting but its inflation data is missing, the voting district average inflation rates prior to the meeting use the other four voting district inflation rates.

Second, we address each MSA series's potential measurement error relative to the FOMC meeting timing. We have a detailed discussion in Section 3.1.2. 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. A similar logic can apply to a bimonthly frequency.

We therefore use the following approach to carefully match FOMC meetings and inflation series. We are interested in the most recent past inflation information. If the CPI series is available at the monthly frequency, then last month's inflation using the lagged value of the meeting's month captures non-future information. Next, let's discuss cases where the CPI series is available at the bimonthly frequency. If the CPI release month coincides with FOMC meeting month t and the meeting date is $\geq$ Day 15, we continue to use the $t-1$ value. This is to capture the possibility that the presidents could already come in with information about their district in the contemporaneous month. In addition, Figure IA.1 below 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. If the CPI release month coincides with meeting month t but the meeting date is $<$ Day 15, we use $t-2$, which is the last release. Similar logic applies to a trimonthly schedule. In sum, the rule of thumb is not to use future data but to always use the most recent inflation data, including in a few cases contemporaneous data when appropriate to prevent overlapping. We also construct an inflation measure where we allow for only historical information; that is, a measure in which we always use the last available inflation data. We consider this robustness test in Table 4, Column (3).

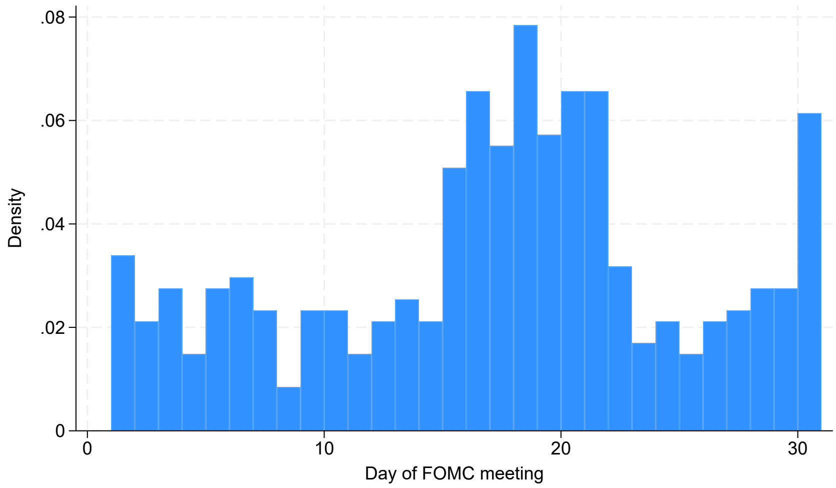

Figure IA.1: Histogram of day of the month of FOMC meetings from 1969-2019.

Third and finally, we obtain MSA-level population data (source: the Census) and compute the population-weighted average. To validate the economic importance of this step, we compare Federal District population data (source: FRED) with the sum of the population from MSAs within a district. 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 district with multiple MSAs, Richmond district 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%.

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

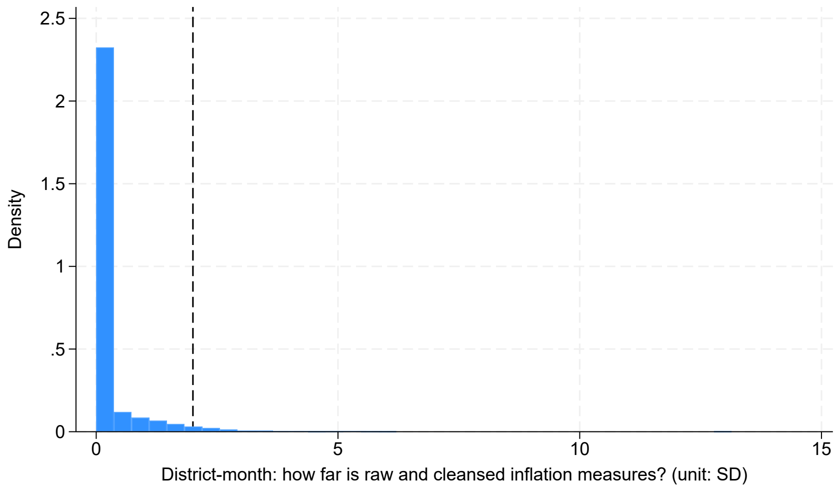


Figure IA.2: **Histogram of standard deviation changes in measured inflation after addressing the inflation measurement and FOMC timing issue.** Specifically, we calculate absolute distance between the naïve inflation rate and the inflation rate with robust measurement timing, and then divide it by the district's recent past (24m) inflation volatility. Dashed line equals to 2.

IA.2. Other Local Macro Measures

During the research process, we also explored other traditional macro variable candidates that would likely affect FFR decisions and evaluated whether they were suitable for our research question. They mostly share two common concerns. Raw data are at the state-level, which leads to a state overlapping concern. We are interested in exploiting cross-district variation and must do our best to mitigate collinearity concerns to start with. However, half of the states (including big ones) sit at district lines. In addition, raw data are available at a lower frequency than monthly; this is an issue as we are interested in identifying new information arriving between meetings, and there are typically two meetings within a calendar quarter. We include more facts and discussions next.

1. Unemployment Rates (UR). UR is a measure commonly used to proxy for real economic activities. From the BLS, we obtain state-monthly unemployment rates. It is a standard fully-balanced database at a high frequency (monthly) starting from 1976. We use state-year population data (source: FRED) to construct district-level population-weighted UR. Table IA.2 below shows the exact state composition in each district. 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.

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

Using the same construction procedure as in Figure 3, Figure IA.3 below depicts the rolling correlation between the voting and non-voting district average UR levels using the 50 past FOMC meetings (see green dotted line). Unemployment rates are always extremely highly correlated over time between voting and non-voting groups, averaging around 0.91 and even moving beyond 0.95 in recent years. Given that our objective is to test whether local economic conditions in voting and non-voting districts have profoundly differential effects on FOMC decisions, a variable with a knowingly high cross-district correlation at almost all times is not ideal.

Our second evaluation is based on whether time variation in the US-level variable is informative about meeting decisions. Table IA.3 below demonstrates the insignificant role of recent past US unemployment rates in explaining changes in FFR, regardless of including controls or the ZLB period or not.

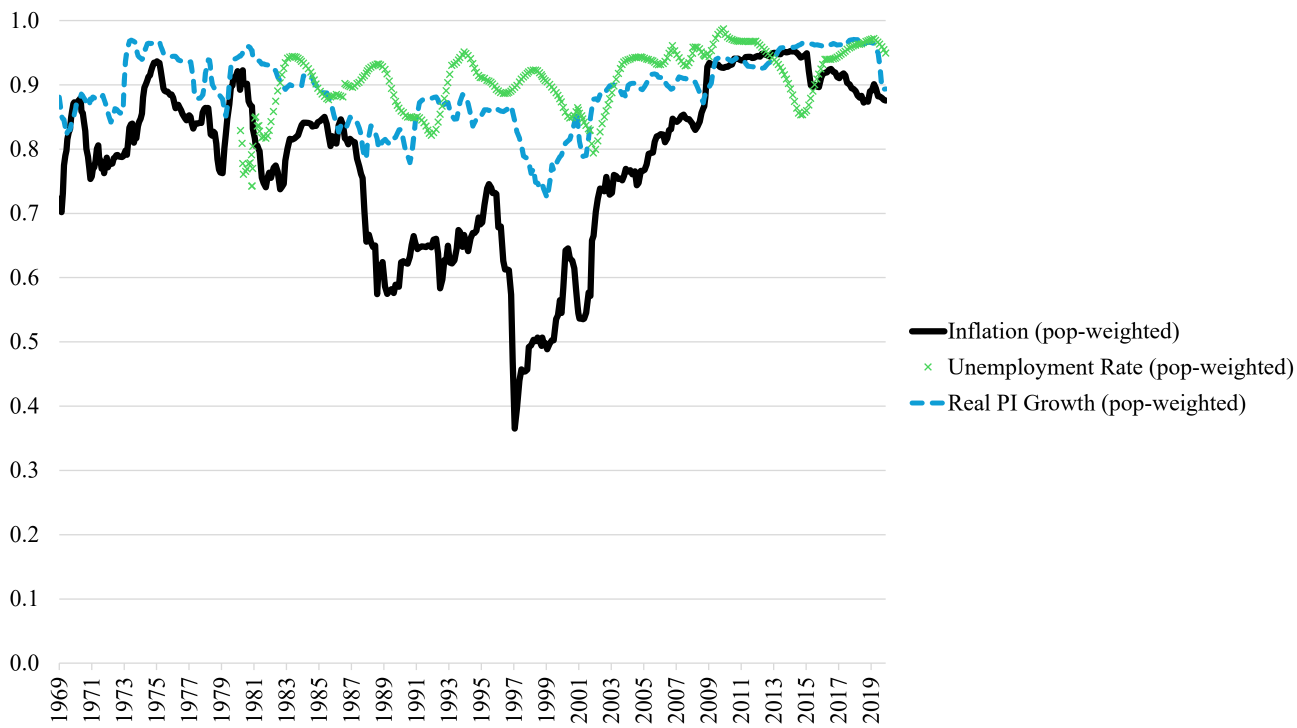


Figure IA.3: **Rolling correlation between voting and non-voting district real variables.** This figure complements Figure 3 and reports the time series of the rolling correlation between voting and non-voting district macro variables: inflation is shown by the black solid line (as originally presented in Figure 3), the unemployment rate is shown by the green dotted line, and real PI growth is shown by the blue dashed line. The rolling window similarly uses 50 FOMC meetings, and the figure presents the rolling correlations beginning in 1/14/1969 and ending in 12/11/2019.

Table IA.3: Macro variables at the U.S. level.

Dependent variable:			ΔFFR_m		
					No ZLB
	(1)	(2)	(3)	(4)	(5)
$Infl^{US}_{m,t-1}$	0.2579**			0.3546**	0.4487***
	(0.129)			(0.138)	(0.172)
$realPI^{US}_{m,q-1}$		0.0933**		0.1098**	0.1658***
		(0.037)		(0.043)	(0.063)
$UR^{US}_{m,t-1}$			-0.0164	-0.0133	-0.0041
			(0.019)	(0.018)	(0.030)
FFR_{m-1}	-0.0253*	-0.0116	-0.0104	-0.0282**	-0.0370**
	(0.013)	(0.015)	(0.017)	(0.014)	(0.018)
Constant	0.0391	-0.0036	0.1449	0.0435	-0.0165
	(0.065)	(0.055)	(0.140)	(0.132)	(0.149)
N	471	471	383	383	326
R^2	0.017	0.025	0.0065	0.046	0.058

2. Real Personal Income Growth. 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 this website 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 downloaded 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; then, we deflate them using our district-level population-weighed inflation measure from the main paper (by first aggregating it into calendar-quarter frequency). For each meeting, we construct recent past quarter voting-group, non-voting group, and 12-district (i.e., the "U.S." variable in our paper) averages of real PI growth rates, denoted as $realPI^{US}_{m,q-1}$, as in Table IA.3 above. That is, if a meeting happens in January, February or March of 2024, we use 2023 Q4's real PI growth. As a result, data limitations of the personal income variable (state overlapping, lack of time-series variation) could be a concern. Regardless, its U.S.-level variable appears to explain changes in the FFR. Figure IA.3 shows that the rolling correlation between voting and non-voting districts' average real PI growth rates always remains quite high as well.

In addition, we compare correlations between 12-district average (US) inflation and real PI growth from our constructions to Greenbook variables that are tested in the Taylor Rule literature (such as Coibion and Gorodnichenko (2012) and Cieslak and Vissing-Jorgensen (2021)) and can serve as validations for our measures. The correlation between the Greenbook nowcast $E_m(gGDP_{q0})$ and our 12-district average quarterly real PI growth at meeting frequency is quite low (0.39 in the full sample; 0.45 in the non-ZLB sample). On the other hand, inflation draws a clear contrast. The correlation between the Greenbook inflation forecast $E_m(Infl_{q1})$ and our 12-district average quarterly inflation (i.e., aggregate past three monthly inflations) at the meeting frequency is 0.77 in the full sample and 0.79 in the non-ZLB sample. The correlations are also similar if we use the last month inflation as in the paper (0.70 in the full sample; 0.73 in the non-ZLB sample). Last but not least, identifying high and low real growth dispersion appear tricky. We have attempted to identify high and low dispersion in real PI growth, but scaling or the level control is tricky. Real growth can often be negative and often times hovers around zero. When we ignore the level control and use simply the max-min spread of real PI growth among the 12 districts, we see high and low dispersion subsamples alternate in a less persistent way, which makes this construct less convincing.

As a result, real PI growth is less suitable for our empirical design, given its low frequency time variation, very high correlation among districts during almost all of our sample period, and low correlation with Greenbook variables.

3. QCEW Real Wage Growth. 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 GB, and

[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."

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

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 shape files; one 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 then apply the BEA's methodology to fix SA.[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; 0.26 in the non-ZLB sample) between QCEW-based real wage growth with $E_m(gGDP_{q0})$.

4. 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 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.4, below, is a full summary of state coverage and data availability. Overall, their measure has reasonable state-level coverage. However, we realize that their dataset is less suitable for our empirical design due to the state overlapping and the quarterly frequency concerns.

[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 codes.

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

Table IA.4: 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.3. Datasets Related to the FOMC

IA.3.1. 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 our target rate data availability:

(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 five years later in its meeting transcript).[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, our research examines 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 all 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 discussed in Section 4.2 and shown in Table IB.2 of this Internet Appendix).

IA.3.2. FOMC dissenter data.

Source Documents

To collect our dissenter data, we compile the voting results for each member – agree, dissent for a tighter monetary policy, dissent for an easier monetary policy, or dissent for other reasons – from various publicly available documents that describe the *proceedings* of the FOMC. There are 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 list 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 time. 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 dissenter(s), as public statements, minutes, transcripts, and other meeting records all summarize this information in one or two sentences. However, we are also interested in whether a dissenter was in favor of tighter or easier policy. In this step, we build on the existing effort by Thornton and Wheelock (2014);[IA.11] they provide *last names* of the voting members who dissented for tighter policy, easier policy, or other reasons in FOMC scheduled meetings from 1936 to present. We make several important necessary additions to their dataset, and we plan to release our dataset for other researchers to use. First, our research team manually checks this existing dataset and is able to validate most documented dissenter names. Then, we record voting results for the conference calls that we also examine in this paper. In addition, our dataset also expands and provides information on who *agreed* with the decision, so that we have a full record of voting decisions by every single member. 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.3.3. FOMC transcript data.

To conduct the textual analysis discussed in Section 4.3, we need to obtain 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 confer-

[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.

ence calls are around 5 to 30 pages. Transcripts are organized in the order that words were spoken by people in the room, including governors and district presidents who have votes, district presidents who do not have votes, Fed economists, and other accompanying staff.

IA.3.4. Target Federal funds rate data.

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

From the February 5, 1997 meeting to the June 19, 2019 meeting, we use Kenneth N. Kuttner's target FFR collection.[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 changes 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.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 were released to be settled at the end of August, the end of September, the end of October, etc. (see e.g. https://www.cmegroup.com/markets/interest-rates/stirs/30-day-federal-fund.quotes.html). These are active contracts with potential trading activities and price fluctuations. Importantly, at the end of the contract term, the value of a Federal funds futures contract is calculated using the arithmetic average of the daily effective Federal funds rates (FFR) during the contract's terminal month, and is reported by the Federal Reserve Bank of New York. If the effective FFR during the terminal month is 2.5%, then the settlement price of a Federal funds futures contract expiring that month would be 100-2.5 = 97.5. Intuitively, if one believes that in the future the target rate will

[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.

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.4 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.

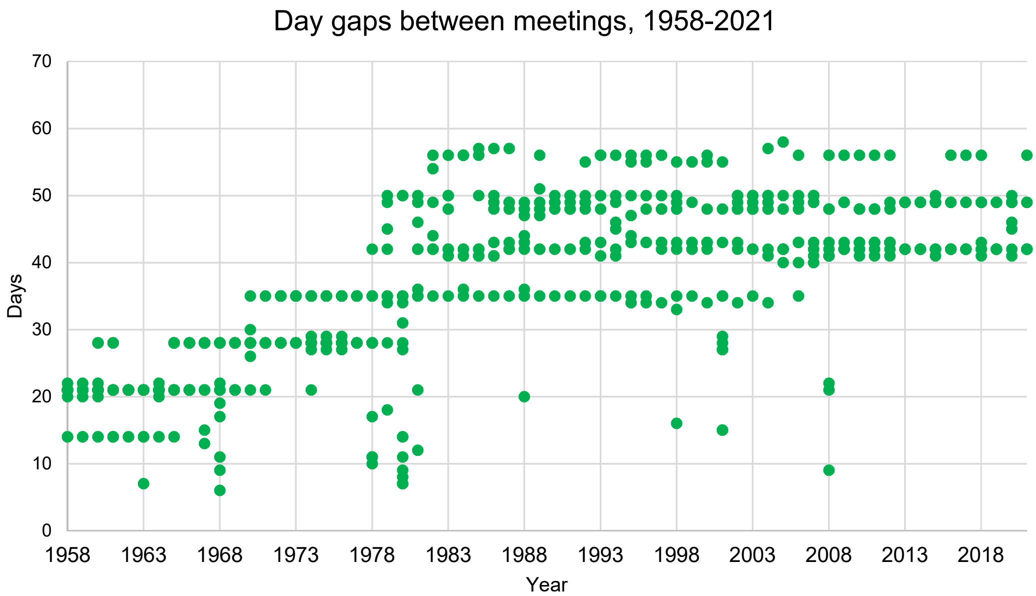


Figure IA.4: Number of days between two meetings. There are a few dots for each year; some years appear to have fewer dots due to overlaps.

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 5.3; 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

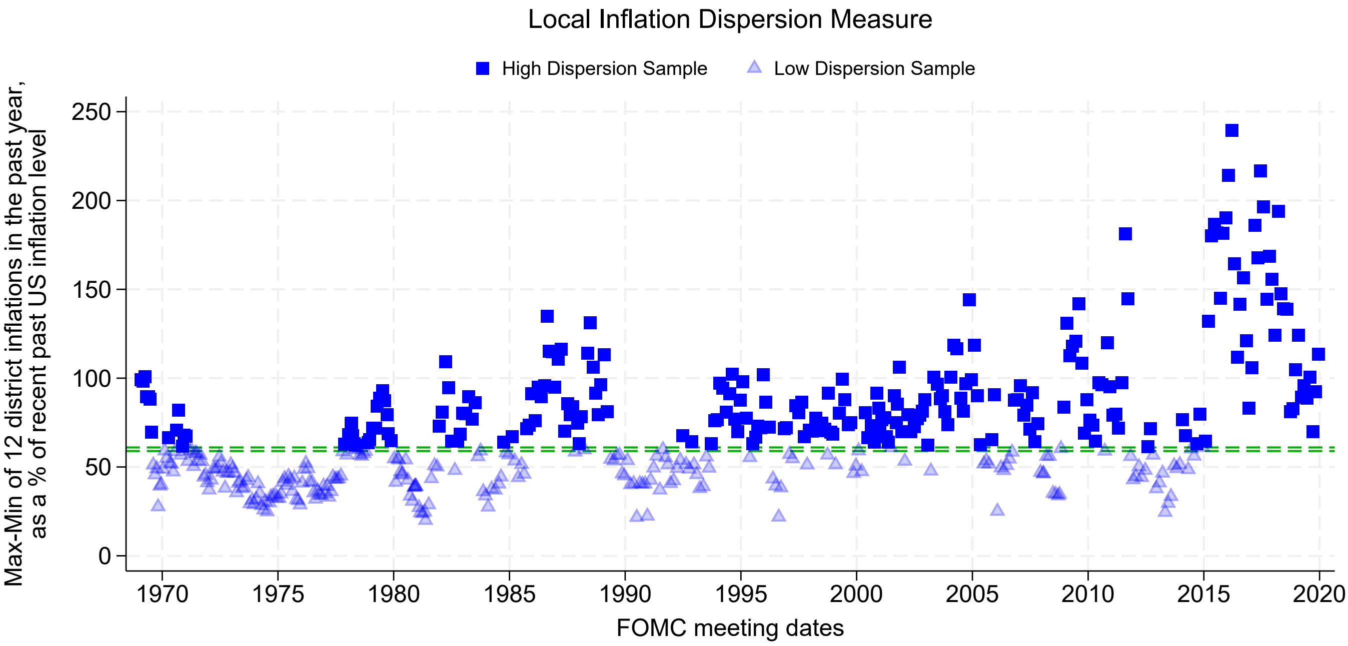
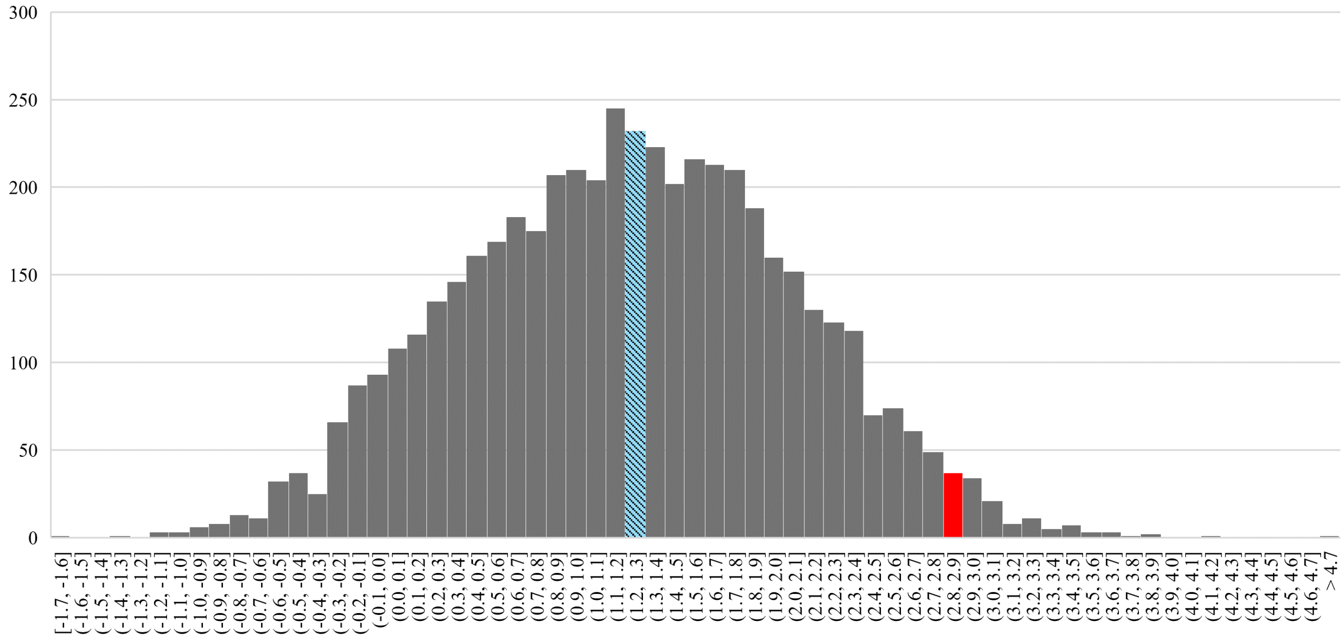
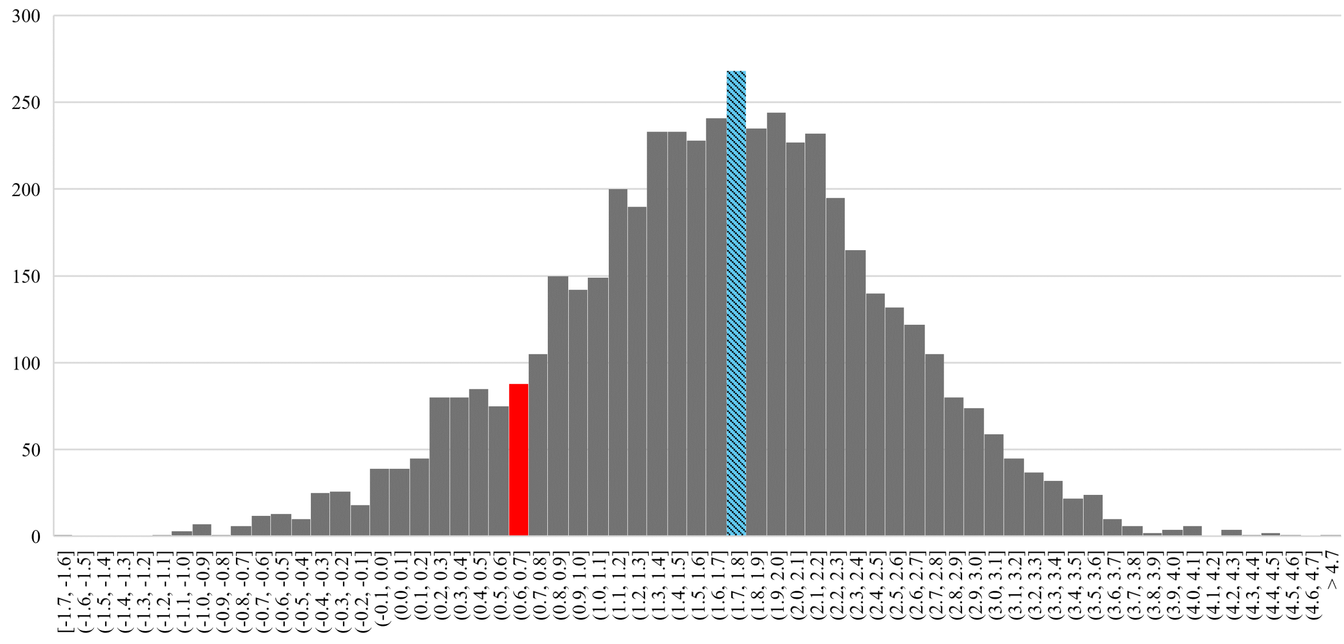


Figure IB.1: **Local inflation dispersion using the original sample.** This figure complements Figure 4 using the original sample. The two dashed lines indicate the 50th cutoff under the full time-series and non-ZLB sample.



(a) Simulated distribution of t statistics of **Voting** Inflation



(b) Simulated distribution of t statistics of **Non-Voting** Inflation

Figure IB.2: **A Voting Schedule Simulation.** We simulate 5000 voting schedules from 1969 to 2019 as follows: (a) New York always vote; (b) for each voting year, 4 additional voting seats are randomly picked from the remaining 11 districts. We calculate the average voting and non-voting inflation series for each realization of voting scheme and recompute the coefficient and t-statistics of the voting-group and non-voting-group inflation in Table 3, Panel B, Column (6) specification (i.e., no ZLB period, subsample when inflation dispersion is high). Gray solid bars show the histograms of t statistics. Blue shaded bars indicate the median value of simulated t statistic. Red bars indicate t statistics that correspond to the actual voting scheme (for voting, the red bar sits at the 97th percentile; for non-voting, 10th percentile). **Findings:** It is extremely rare (around 3%) to obtain the statistical significance of the voting inflation as high as that from the actual voting schedule under the null distribution with random voting schedules. In addition, under the null distribution, it is more common for non-voting inflation to be significant than for voting inflation.

Table IB.1: **Cascading regression.** This table is to demonstrate the abilities of voting and non-voting macro variables from various non-overlapping periods. This table focuses on the No ZLB and high inflation dispersion sample. All inflation variables are scaled to monthly percent for comparison convenience. Specifically, Columns (1)-(3) include cascading monthly values at the monthly frequency (i.e., $t-2$ indicates second to last month), and Columns (4)-(7) include cascading 3-month values (i.e., $t-1 \sim t-3$ indicates an average from $t-1$ to $t-3$). Column (4) is also presented in our robustness evidence in Table 4, Panel B. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:				ΔFFR_m			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Infl^{Vote}_{m,t-1}$	0.4235***	0.4744***	0.5328***				
	(0.155)	(0.173)	(0.180)				
$Infl^{NoVote}_{m,t-1}$	0.1053	0.0054	-0.0334				
	(0.153)	(0.186)	(0.185)				
$Infl^{Vote}_{m,t-2}$		-0.2266	-0.2806				
		(0.202)	(0.214)				
$Infl^{NoVote}_{m,t-2}$		0.2785	0.2225				
		(0.181)	(0.173)				
$Infl^{Vote}_{m,t-3}$			0.2665*				
			(0.158)				
$Infl^{NoVote}_{m,t-3}$			-0.0561				
			(0.158)				
$Infl^{Vote}_{m,t-1\sim t-3}$				0.4370*	0.5088**	0.9032***	0.9083***
				(0.239)	(0.256)	(0.262)	(0.260)
$Infl^{NoVote}_{m,t-1\sim t-3}$				0.1789	0.1072	-0.2267	-0.2231
				(0.256)	(0.229)	(0.255)	(0.273)
$Infl^{Vote}_{m,t-4\sim t-6}$					0.3529	0.4466	0.5192*
					(0.281)	(0.282)	(0.291)
$Infl^{NoVote}_{m,t-4\sim t-6}$					-0.2307	-0.2791	-0.3357
					(0.321)	(0.294)	(0.337)
$Infl^{Vote}_{m,t-7\sim t-9}$						0.9416*	0.9511*
						(0.531)	(0.527)
$Infl^{NoVote}_{m,t-7\sim t-9}$						-0.7744*	-0.7785*
						(0.415)	(0.434)
$Infl^{Vote}_{m,t-10\sim t-12}$							0.2447
							(0.322)
$Infl^{NoVote}_{m,t-10\sim t-12}$							-0.1790
							(0.351)
FFR_{m-1}	-0.0152	-0.0160	-0.0202	-0.0172	-0.0223	-0.0345**	-0.0376**
	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.014)	(0.015)
Constant	-0.0389	-0.0386	-0.0498	-0.0597	-0.0673	-0.0892	-0.0992
	(0.067)	(0.065)	(0.069)	(0.070)	(0.075)	(0.083)	(0.076)
N	206	206	206	206	206	206	206
R^2	0.10	0.11	0.12	0.089	0.097	0.14	0.14

Table IB.2: **Predicting changes in the FFR: excluding conference calls.** This table complements Columns (5) and (6) of Table 3, Panel B by excluding the 13 meetings that were conducted through conference calls (out of 472 meetings we focus on in the paper). The median values of inflation dispersion in both the baseline and the robust inflation measurement samples use the same cutoff as in Table 3. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m			
Robust Inflation Measurement sample:	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
$Infl^{US}_{m,t-1}$	0.4481***		0.5107***	
	(0.126)		(0.128)	
$Infl^{Vote}_{m,t-1}$		0.3995**		0.4230***
		(0.156)		(0.155)
$Infl^{NoVote}_{m,t-1}$		0.0655		0.1029
		(0.155)		(0.153)
FFR_{m-1}	-0.0062	-0.0080	-0.0139	-0.0154
	(0.014)	(0.014)	(0.015)	(0.015)
Constant	-0.0479	-0.0397	-0.0362	-0.0299
	(0.066)	(0.067)	(0.066)	(0.067)
N	201	201	202	202
R^2	0.084	0.091	0.095	0.10

Table IB.3: **Predicting changes in Federal funds rates: FFR lags robustness.** This table complements Columns (5) and (6) of Table 3, Panel B by including 2 more lags of FFR. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m			
Robust Inflation Measurement sample:	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
$Infl^{US}_{m,t-1}$	0.4307***		0.4827***	
	(0.124)		(0.127)	
$Infl^{Vote}_{m,t-1}$		0.3979**		0.4289***
		(0.157)		(0.157)
$Infl^{NoVote}_{m,t-1}$		0.0459		0.0653
		(0.159)		(0.160)
FFR_{m-1}	0.0826	0.0760	0.1256	0.1221
	(0.097)	(0.096)	(0.146)	(0.143)
FFR_{m-2}	-0.0699	-0.0528	-0.1503	-0.1344
	(0.169)	(0.173)	(0.215)	(0.217)
FFR_{m-3}	-0.0191	-0.0312	0.0092	-0.0046
	(0.128)	(0.132)	(0.128)	(0.133)
Constant	-0.0492	-0.0408	-0.0304	-0.0234
	(0.067)	(0.069)	(0.067)	(0.068)
N	204	204	204	204
R^2	0.100	0.11	0.11	0.12

Table IB.4: **Predicting changes in Federal funds rates: During the low inflation dispersion period.** This table complements Columns (5) and (6) of Table 3, Panel B by considering only the low inflation dispersion period. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:		ΔFFR_m		
Robust Inflation Measurement sample:	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
$Infl^{US}_{m,t-1}$	0.2248		0.2349	
	(0.302)		(0.289)	
$Infl^{Vote}_{m,t-1}$		0.0100		0.2402
		(0.600)		(0.574)
$Infl^{NoVote}_{m,t-1}$		0.2225		0.0216
		(0.694)		(0.677)
FFR_{m-1}	-0.0417	-0.0424	-0.0411	-0.0421
	(0.027)	(0.027)	(0.028)	(0.028)
Constant	0.1400	0.1417	0.1388	0.1325
	(0.181)	(0.175)	(0.174)	(0.169)
N	208	208	208	208
R^2	0.021	0.022	0.020	0.022

Table IB.5: **Predicting changes in Federal funds rates: Dispersion variable robustness.** This table complements Columns (5) and (6) of Table 3, Panel B by using an alternative inflation dispersion variable for robustness. That is, instead of using the max-min spread among the 12 districts as in the paper, we calculate the standard deviation among the 12 districts; both are then scaled by the recent past U.S. inflation level to capture the relative dispersion. One concern with calculating the standard deviation using 12 numbers is its small sample; therefore, in the main paper, we prefer to use the simple max-min spread. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:		ΔFFR_m		
Robust Inflation Measurement sample:	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
$Infl^{US}_{m,t-1}$	0.4936***		0.4075***	
	(0.127)		(0.084)	
$Infl^{Vote}_{m,t-1}$		0.3584**		0.2739*
		(0.154)		(0.146)
$Infl^{NoVote}_{m,t-1}$		0.1475		0.1430
		(0.159)		(0.146)
FFR_{m-1}	-0.0027	-0.0041	-0.0085	-0.0094
	(0.015)	(0.015)	(0.014)	(0.014)
Constant	-0.0807	-0.0747	-0.0389	-0.0361
	(0.067)	(0.068)	(0.055)	(0.055)
N	206	206	206	206
R^2	0.11	0.11	0.081	0.085

Table IB.6: **Predicting changes in Federal funds rates: Adding real growth control.** This table complements Columns (5) and (6) of Table 3, Panel B by including the last quarter US real growth control. See other table details in Table 3. Robust standard errors are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable:	ΔFFR_m			
Robust Inflation Measurement sample:	No	No	Yes	Yes
	(1)	(2)	(3)	(4)
$Infl^{US}_{m,t-1}$	0.4750***		0.5384***	
	(0.123)		(0.126)	
$Infl^{Vote}_{m,t-1}$		0.4105***		0.4318***
		(0.155)		(0.154)
$Infl^{NoVote}_{m,t-1}$		0.0814		0.1218
		(0.152)		(0.149)
$rgPI^{US}_{m,q-1}$	0.0372	0.0377	0.0436	0.0434
	(0.028)	(0.028)	(0.028)	(0.028)
FFR_{m-1}	-0.0078	-0.0096	-0.0155	-0.0170
	(0.015)	(0.015)	(0.015)	(0.015)
Constant	-0.0773	-0.0695	-0.0700	-0.0638
	(0.062)	(0.062)	(0.061)	(0.062)
N	206	206	206	206
R^2	0.090	0.097	0.10	0.11