Local Monetary Policy*

Vyacheslav Fos† Tommaso Tamburelli‡ Nancy R. Xu§

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Abstract

When Federal Reserve districts experience high inflation or low unemployment but lack voting rights to influence FOMC decisions, credit extended to commercial banks through the Discount Window (DW) declines. Our identification strategy is based on the exogenous rotation of voting rights among Reserve Banks and on within borrower-time and district-time variation in DW loans and Federal Home Loan Bank (FHLB) loans, implying that factors related to changes in macroeconomic conditions, local credit demand, or borrower characteristics do not drive the results. The effect on bank funding sources translates into changes in the composition of loans extended by commercial banks.

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†Seidner Department of Finance, Carroll School of Management, Boston College; CEPR, ECGI, NBER; Email: fos@bc.edu.

‡Seidner Department of Finance, Carroll School of Management, Boston College; Email: tamburel@bc.edu.

§Seidner Department of Finance, Carroll School of Management, Boston College; Email: nancy.xu@bc.edu.

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. In the Fed's early years, all twelve presidents of the Federal Reserve Banks held voting rights at FOMC meetings and operated with considerable independence outside those meetings, often implementing distinct district-level policies, as documented in Richardson and Troost (2009) and Amir-Ahmadi, Cortes, and Weidenmier (2020). The Banking Act of 1935 established the modern FOMC governance structure, granting voting rights to the Board of Governors and moving toward a more centralized approach to monetary policy. Since then, an extensive body of literature views U.S. monetary policy as one centralized policy (e.g., Taylor, 1993).

This paper proposes and tests a new hypothesis: Does local monetary policy (LMP) exist under the current regulatory environment? That is, we ask whether Reserve Banks use *local* monetary tools in response to changes in *local* economic conditions. Specifically, we test whether the amount of loans extended at the Discount Window (DW) respond to changes in local dual mandate variables – namely, inflation and the unemployment rate. We focus on the DW lending facility because it is one of the few central bank functions under the direct oversight of local Reserve Banks. While the price of DW loans (i.e., the discount rate) is homogeneous across all twelve districts, if LMP exists, we should observe that Reserve Banks influence their local economy by controlling the quantity of DW loans, i.e., the supply of DW credit. Although LMP could operate through other channels, we focus on studying the quantity of DW loans because, to the best of our knowledge, it is the only observable and measurable local tool. Our paper provides the first evidence of local monetary policy in today's Fed, complementing the vast literature on national monetary policy tools and encouraging further research on local instruments.

Our empirical strategy must overcome the following challenges. First, we need to have measurable variation in the incentives of Federal Reserve Banks to rely on local monetary policy rather than national monetary policy to address local economic needs. Second, we need to identify the actions taken by the Federal Reserve Banks, as loan quantities are jointly determined by the Reserve Banks (supply) and the borrowers (demand). Third, we must ensure that our findings are not confounded by aggregate economic conditions.

To address the first challenge, we use the exogenous yearly FOMC voting rotation established in 1942. This variation distinguishes between district-time level observations where Federal Reserve Banks can address changes in local economic conditions by influencing aggregate Federal funds target rate (FFR) decisions and those where this national tool is less accessible. Indeed, Fos and Xu (2025) show that during periods of large cross-district dispersion in local economic conditions, inflation and unemployment rates in voting districts significantly influence the FOMC's FFR decision, whereas the economic conditions in non-voting districts have no measurable impact.

To address the second challenge, our main analysis includes other liquidity loans that are available to borrowers but not controlled by Federal Reserve Banks, such as Federal Home Loan Bank (FHLB) loans and Repurchase Agreement (REPO) loans. By focusing on the differential responses of DW loans and other liquidity loans to changes in local economic conditions, we isolate the incremental supply-side effect of Federal Reserve Banks on DW loans.[1] To address the third challenge, we use district-by-time fixed effects to absorb variation resulting from changes in local (and thus aggregate) economic conditions. This allows us to better compare DW and other liquidity loan activities within each district-quarter. We also use borrower-by-time fixed effects to absorb variations due to changes in a borrower bank's characteristics.

We use various publicly available datasets. From the Federal Reserve website, we obtain DW loan-level data that is published quarterly from Q3 of 2010 with an

[1] This empirical design draws inspiration from Khwaja and Mian (2008), who use a firm's relationship to multiple lenders to control for credit demand. In our setting, we examine within-borrower variation in borrowing from the Discount Window (DW) and the Federal Home Loan Bank (FHLB).

approximately two-year delay. From Call Reports, we obtain bank-level data available at the quarterly frequency, including Federal Home Loan Bank (FHLB) loans and Repurchase Agreement (REPO) loans, as well as information on banks' loan issuances used to analyze the real effects of LMP. In our main empirical analysis, we aggregate the DW loan-level data to the bank-quarter level and stack it with quarterly FHLB loan data to isolate the supply-side effect. Our main dependent variable is liquidity loan amount scaled by the borrower's total assets at the last quarter-end. Our main sample spans from Q3 of 2010 to Q3 of 2022 and covers 7,843 unique banks. About 35% of them have accessed the DW in their registered district and 28% have accessed it more than once during our sample period. To measure local economic conditions, we construct two monthly district-level macro variables aligned with the Fed's dual mandate – inflation and unemployment rates – using data from Bureau of Labor Statistics databases. Lastly, we use voting status data collected by Fos and Xu (2025).

We begin by presenting the unconditional relationship between local economic conditions and liquidity loan activities. We find that DW loan activity and FHLB loan activity exhibit statistically different responses to local economic conditions, even when we control for district-time and bank-loan-type fixed effects. These results are robust to a wide range of fixed effects and provide the initial evidence that DW loans respond to local economic conditions significantly and differently from loans not directly controlled by Reserve Banks, such as FHLB loans.

For identification, we use the exogenous FOMC voting rotation to isolate district-times when local Reserve Banks have *limited* access to national monetary policy to address local economic needs; we then examine whether the differential response of DW and FHLB loan activities to changes in local inflation and UR is driven by this subsample. To begin, we find that when a district has voting rights, the responses of DW and FHLB loans to changes in local economic conditions are statistically similar. This is expected, as districts with voting power can influence national monetary policy to address local needs, reducing the role of or need for local monetary policy. On the other hand, when a district lacks voting rights, we find robust evidence that higher local inflation (lower UR) leads to significantly reduced DW activities relative to FHLB activities. These results hold when we use district-time fixed effects to absorb aggregate and district-time variation and borrower-time fixed effects to absorb changing borrower bank characteristics.

We conduct a wide array of robustness tests to further strengthen our findings and summarize a few below. First, we confirm the results are robust to sample selection; they remain significant even when we restrict our sample to banks that accessed both DW and FHLB loans. Second, our results hold when using only the second month's inflation or unemployment rates to better isolate information entering DW decisions, as DW loans are mostly issued in the third month of a quarter and FOMC meetings typically occurring in the first and third months. Third, we replace FHLB loans with REPO loans as an alternative demand proxy. Despite their differences – for example, FHLB loans being government-sponsored while REPO loans are market-driven – we find similar coefficient estimates, supporting the robustness of our results. We explore many other robustness checks that include dropping one district at a time, analyzing subsamples with heightened policy attention to macro variables (e.g., high cross-district dispersion or frequent transcript mentions), focusing on periods of elevated DW activity, and excluding seasonal loans — since local monetary policy, if active, requires submitted loan applications to exert influence. All results remain intact.

In the final part of the paper, we study whether local monetary policy leads to changes in commercial bank lending. Specifically, we ask whether commercial bank lending activities respond to local economic conditions in a way that is consistent with the existence of local monetary policy. Importantly, we do not take a stance on whether this real effect is due to the Discount Window channel of local monetary policy or any other channel used by Reserve Banks. We find that higher local inflation or lower local unemployment – an overheated condition – are associated with a significantly greater reduction in non-FHLB-supported loans when a district lacks voting rights compared to when it holds them. In terms of the economic magnitude, a one SD increase in local inflation leads to a 0.059% decrease in quarterly loan changes (as % assets), which is sizable given the median quarterly change is 0.095% and the average quarterly change is 0.474%.

Our paper contributes to three strands of the literature. First, this study contributes to the extensive monetary policy literature that studies how the Federal Reserve reacts to changing economic conditions (e.g., Taylor (1993) and many that follow). To the best of our knowledge, Richardson and Troost (2009) and Amir-Ahmadi, Cortes, and Weidenmier (2020) are the only studies that point to the idea that Reserve Banks react to local economic conditions. In Richardson and Troost (2009), the authors use the borders between the St. Louis and Atlanta districts to show that during a banking crisis in 1930, Atlanta extended discount window loans and St. Louis did not. Amir-Ahmadi, Cortes, and Weidenmier (2020) document that between 1923-33 each Reserve Bank set their own discount rates in response to regional economic conditions. We contribute to this literature by documenting the robust effect of local economic conditions on Reserve Banks' decisions to use *local* monetary tools in the current policy environment.

Second, our paper contributes to the literature that studies the functioning of the Discount Window. Most of the extant literature has focused on understanding who borrows from the "lender of last resort" (e.g., Drechsler, Drechsel, Marques-Ibanez, and Schnabl (2016)).[2] Most papers in this literature discuss the "Discount Window Stigma," showing mixed evidence (see, e.g., Armantier, Ghysels, Sarkar, and Shrader (2015) versus Artuç and Demiralp (2010)). A more recent strand focuses on documenting the functioning of the DW during normal times (e.g., Ackon and Ennis (2017), Ennis, Ho, and Tobin (2019), Ennis and Klee (2021)). Our paper contributes

[2]The literature on FHLBs is relatively small, focusing mostly on documenting the FHLB as practically a lender-of-to-last resort (e.g., Stojanovic, Vaughan, and Yeager (2008), Ashcraft, Bech, and Frame (2010), Acharya and Mora (2015)).

to this literature by establishing the DW as an active *local* monetary policy tool. We find evidence that local economic conditions affect the quantity of DW credit. The evidence offers a novel perspective on the Discount Window as an "open-door" credit facility. The collapse of Silicon Valley Bank in March 2023 illustrates a real-world case where a bank attempted to borrow from the Discount Window but was unable to obtain emergency loans.

Finally, this paper builds on the literature that studies the role of governance and voting in the Fed system. One traditional strand of this literature studies how FOMC member background characteristics explain their voting behaviors (e.g., Belden (1989), Havrilesky and Schweitzer (1990), Havrilesky and Gildea (1991), Chappell Jr, Havrilesky, and McGregor (1993), Chappell Jr and McGregor (2000), Meade and Sheets (2005), Crowe and Meade (2008), Malmendier, Nagel, and Yan (2021), and Bordo and Istrefi (2023)). Two recent contemporaneous works use the exogenous FOMC voting rotation to study the causal effect of the hawk-dove balance on economic outcomes (Hack, Istrefi, and Meier, 2023) and the causal effect of presidents' voting rights on their communication behavior (Ehrmann, Tietz, and Visser, 2022). Fos and Xu (2025) study the role of economic conditions in Reserve Bank districts in shaping the Federal funds target rate (FFR) decisions. Our paper contributes to this literature by showing that the governance structure of the Fed system leads to tension between national and local interests, and that local Reserve Banks take action to more closely align monetary policy with local economic conditions.

2 Data

In this section, we first describe data sources and construction details for our main datasets and then discuss key summary statistics. Additional information is relegated to Appendix Section A.

2.1 Discount Window Loans

The Discount Window (DW) is "an instrument of monetary policy that allows eligible borrowers to borrow money, usually on a short-term basis, to meet temporary shortages of liquidity caused by internal or external disruptions."[3] The DW was established by the Federal Reserve Act of 1913. For the first 100 years, its activities were not easily observable by the public. However, following the implementation of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the Board of Governors of the Federal Reserve System began disclosing loan-level information on DW lending activity; the data is published quarterly on the Federal Reserve's website with approximately a two-year delay.[4]

There are three types of DW loans: primary, secondary, and seasonal. According to this loan-level dataset, 75% of all DW loans are primary loans (i.e., made to borrowers in sound financial condition), while seasonal and secondary loans make up 24% and 1% respectively. We consider all three types of DW loans in our research. Interest rates on DW loans, commonly known as the discount rates, are set homogeneously across the Reserve Banks and, since January 6, 2003, constitute an upper bound on the Federal funds rate, according to the regulatory change announced on October 31, 2002.[5] There is great variation in the size of DW loans, which can range from $1,000 to $5 billion. The very small loans (typically round numbers such as $1,000, $10,000, and $100,000) are mostly exercises to test the correct functioning of a bank's direct line of credit to the DW. Knowing that, we only consider individual DW loans above $100,000 in our analysis.[6]

[3]Source: https://www.frbdiscountwindow.org/RightNavPages/Getting-Started.

[4]For each DW loan, we observe the origination date, the identity of the borrower (i.e., name, city, state, primary ABA routing number), the lending Federal Reserve Bank, the dollar amount, the amount of collateral on the borrower's balance sheet, the loan's maturity, and the type of credit. The initial reporting period covers loans made between July 22, 2010 and September 30, 2010, which marks the start of our sample period. Sources: https://www.federalreserve.gov/monetarypolicy/bst_reports.htm, https://www.federalreserve.gov/regreform/discount-window.htm.

[5]See Appendix Section A.1 for details on this regulation.

[6]The main analysis excludes the test loans. In Internet Appendix B.4, we conduct robustness tests of our main results including the test loans. Our findings remain robust.

2.2 Outcome Variables

Our main analysis is conducted at the borrower-quarterly level. This approach enables us to test differences between various types of liquidity loans, thus better examining supply versus demand. It also allows for the flexible incorporation of controls for borrower-quarterly characteristics. Specifically, we aggregate DW loans at the borrower-quarterly level and scale them by the borrower's total assets at the previous quarter-end. This variable is labeled "DW Loans % Assets" throughout the paper. During our sample period (2010-2022), over 35% of all commercial banks in the U.S. accessed the DW at least once.

We then use the primary ABA routing number to merge this dataset with commercial banks' Call Report data. Using Call Reports, we obtain information on two additional sources of liquidity loans available to commercial banks: Federal Home Loan Bank (FHLB) loans and Repurchase Agreements (REPOs). The U.S. government-sponsored FHLB system aims to enhance the efficiency of the housing market by providing member banks with access to on-demand liquidity. Recent literature (e.g., Ashcraft, Bech, and Frame, 2010) suggests that FHLBs function as "typical lenders of last resort," benefiting from significant support from Congress and the Federal government, which contributes to lower operational costs. The FHLB system is divided into 11 districts, closely paralleling the Federal Reserve district map. Appendix Section A.2 provides more details.

Both the DW and the FHLB serve as important sources of liquidity, not only for the broader financial sector during times of distress but also for small banks that face barriers to participating in open markets and are more vulnerable to local economic conditions. In fact, nearly 90% of the banks that have used the DW also reported borrowing from the FHLB — a significant portion of the sample between 2010 and 2022. In our main analysis, we focus on FHLB loans as our primary alternative funding source to capture local liquidity demand, allowing us to draw comparisons with our hypothesis of local liquidity supply. To align with the short-term nature of DW loans, we concentrate on FHLB advances maturing in less than one year. We construct the variable "Chg FHLB % Assets," which represents the quarterly change in outstanding FHLB advances, scaled by the borrower's total assets at the previous quarter-end. Our results remain robust when using REPOs as an alternative control for borrower bank liquidity demand.[7]

2.3 Local Economic Conditions

We construct two monthly macro variables given the Fed's dual mandate: inflation and unemployment rates. Local inflation refers to the inflation rates of the 12 Federal Reserve Bank districts. Since inflation or CPI data are not readily available at the Reserve Bank district or state level at the frequency of FOMC meetings, we follow Fos and Xu (2025) and construct population-weighted inflation rates using Metropolitan Statistical Area (MSA) CPI data. The underlying CPI and population data are sourced from the Bureau of Labor Statistics (BLS).[8] Similarly, local unemployment rates refer to the unemployment rates (UR) of the 12 Federal Reserve Bank districts. We obtain monthly state-level UR data from the Bureau of Labor Statistics (BLS). For each district, we use the unemployment rate of the state where the Reserve Bank is headquartered as a proxy for local unemployment. This allows us to feed our empirical framework with meaningful cross-district variation, given that half of the 50 states span across two districts.

[7]Given the extremely short timeline of Repurchase Agreements (within three months), our REPO variable "REPO % Assets" is constructed as the outstanding amount of REPO securities scaled by the borrower bank's previous quarter-end total assets. REPOs have clear limitations: they operate on a national scale without local variations, and only 40% of banks using the DW engage in REPO transactions, indicating differences in borrower groups. Moreover, events such as the Fed's liquidity injections through REPOs in March 2020 complicate their interpretation, unlike the more targeted support provided by the Federal Home Loan Banks. While comparing DW and REPOs can yield valuable insights, these limitations should be taken into account.

[8]It is noteworthy that ours is not the first paper to use BLS MSA CPI-U data to proxy for local inflation in finance and economics literature (e.g., Reinsdorf (1994), Coen, Eisner, Marlin, and Shah (1999), Cortes (2008), Bils, Klenow, and Malin (2012), Vavra (2014), Diamond (2016), Stroebel and Vavra (2019), Mian, Sufi, and Verner (2020), among many others).

Next, we describe how local monthly inflation and unemployment rates are integrated into our main empirical framework, which is structured at the borrower-quarter level. Ideally, we would want to know when Reserve Banks make DW decisions and then use the most recent macro indicator to test whether it affects DW decisions. Unfortunately, the exact or approximate time when Reserve Banks discuss DW activities is not public knowledge. Therefore, we use loan-level data to proxy for the schedule, meaning when these loans are granted and transacted.

Figure 1 illustrates the timing of DW loan transactions within one calendar quarter using the longest possible loan-level sample. The majority of DW loans are granted in the last month of each quarter. Therefore, we use the weighted average of inflation or unemployment rates in the first and second months of each quarter, with weights corresponding to the number of FOMC meetings in the following month. Intuitively, this measure should capture relevant information that informs monetary policy in a given quarter. One of our main measures, "Local Inflation," is labeled as Infl_{jt-1}, where j represents district j and $t-1$ indicates the weighted average inflation rate of the first two months of quarter t. Similarly, the other component of the Fed's dual mandate "Local UR" is labeled as UR_{jt-1}.[9] We conduct a series of measurement robustness checks, which we discuss in Section 4.3.

[Insert Figure 1 here]

Figure 2 validates data quality by illustrating our key aggregate time series. Specifically, we aggregate district-monthly inflation into district-yearly inflation using a 12-month rolling window and then compute the average across all 12 districts to obtain

[9]We have considered other measures of district-level economic activity but concluded that they are either less suitable or not available for our research setting. For example, real personal income growth can be constructed at district-quarter level (source: BEA), but macro conditions from the last quarter-end may be outdated for current quarter-end DW decisions. In fact, if we collapse our monthly inflation or UR data into quarterly variables, our main results would be significantly weakened. Please see detailed evidence in Internet Appendix Table B.2. This result is not surprising, as the most recent monthly inflation may already reflect DW activity. At the same time, it highlights the value of using higher-frequency (i.e., monthly) macroeconomic variables to capture timely economic conditions preceding DW loan issuance.

a district-based measure of U.S. yearly inflation (solid green line). For comparison, we plot the official U.S. yearly inflation from the aggregate CPI series in FRED (dashed green line). The two series are nearly indistinguishable over time, with a correlation of 99.82%, underscoring the accuracy of our constructed measure. We conduct a parallel analysis for U.S. unemployment rates (red lines), which similarly exhibit a high correlation of 99.90%, as expected given the persistence of unemployment dynamics.

[Insert Figure 2 here]

2.4 Other Variables

The main analysis can flexibly include various controls for borrower-quarterly characteristics. We consider standard variables such as ln(Assets), Tier 1 capital ratio, return on assets, total deposits as a percent of bank's liabilities, and the amount of commercial and industrial loans outstanding scaled by the bank's assets (as listed in Appendix Table A.1 with summary statistics included in Internet Appendix Table B.1).

The modern FOMC is comprised of twelve voting members. The seven individuals on the Board of Governors of the Federal Reserve System and the president of the Federal Reserve Bank of New York always vote, and the remaining four voting seats rotate among the remaining eleven Reserve Bank presidents for one-year voting terms. The rotation rule is based on the 1942 amendment to the 1913 Federal Reserve Act. We use voting status data collected by Fos and Xu (2025). Note that each borrower bank can be associated with only one Federal Reserve District by law.

Finally, in our economic implications analysis, we examine loan issuance by borrower banks to local businesses and households using data from the Call Report. Specifically, we focus on two groups of loans that align with our empirical strategy. The first group includes loans issued to firms that are not supported by FHLB funding, such as commercial and industrial loans and non-residential real estate loans. The second group consists of residential real estate loans, such as mortgages, which are typically issued to households.

2.5 Summary Statistics

We discuss relevant summary statistics for our main specification next. Our main borrower-quarter sample spans from Q3 of 2010 to Q3 of 2022 and covers 7,843 unique banks. About 35% of them have accessed the DW and 28% have done so more than once. For borrower-quarters with non-zero DW transactions, the average quarterly DW loan amount is around $37 million, or 4.8% of the total assets outstanding.

Table 1, Panel A(1) demonstrates the comparable variability (standard deviation) of DW, FHLB, and REPO loans % Assets in our main borrower-quarter panel. Discount Window loans have short maturities; therefore, at the quarterly frequency, we use loan-level data to calculate the total loan amount within the district-quarter. This approach explains why the "DW Loan % Assets" variable in Table 1 does not have negative values. In contrast, we only observe quarterly snapshots of FHLB loan balances, and changes in quarterly balances can yield negative observations.

[Insert Table 1 here]

In our borrower-quarterly dataset from 2010 to 2022, Panel A(1) also shows that average monthly local inflation is around 0.204% (or 2.45 per annum). Local unemployment rate has a mean around 5.858%. 60.5% of the data points correspond to periods in which the district has no voting right at FOMC meetings. Panels A(2) and A(3) report summary statistics for observations in voting and non-voting subsamples, respectively. To conserve space, summary statistics for control variables such as borrower bank characteristics are relegated to Appendix Table B.1.

3 Empirical Strategy

3.1 Discount Window Loans as Local Monetary Policy Gauge

We next discuss and motivate the use of the Discount Window (DW) as our local monetary policy (LMP) gauge, which is at the core of our empirical strategy. The DW lending facility is one of the few central bank functions still under the *direct* oversight of local Reserve Banks. The Board of Governors determines the Discount Window rates for all twelve districts, and therefore the "price" of DW loans is homogeneous across all districts. If LMP exists, we should observe that local Reserve Banks affect the local economy by controlling the "quantity" of DW loans, i.e., the supply of DW credit. Accordingly, whereas DW lending is probably not the sole instrument of LMP, it serves as a suitable and quantifiable gauge for evaluating the LMP hypothesis.

This hypothesis offers an alternative perspective to the idea of the Discount Window as only a liquidity "backstop," a "lender-of-last-resort." A key challenge lies in the limited academic research on the functioning of the DW. However, major news outlets have critiqued the conventional view, asking why Lehman and Silicon Valley Bank, among others, did not access the DW (source: WSJ, September 12, 2008; Reuters, August 2, 2023) and why the DW in general does not seem to lend to banks on the brink of failure (source: WSJ, April 12, 2011).[10] The April 2, 2011 WSJ article "Fed's Discount Window: Closed for Banks on Brink" used the same data source we did in our research and was quite explicit:

> "*The U.S. Federal Reserve may be the lender of last resort, but not, it turns out, for banks on the brink of insolvency. Data recently provided by the Federal Reserve and analyzed by Dow Jones show that of 201 banks that failed between February 2008 and March 2010, only 11 had loans outstanding from the central bank's discount window when they failed...* <u>*The revelation that the Fed sometimes will reject a bank's discount-window request therefore*</u>

[10] https://www.wsj.com/articles/BL-REB-1952; https://www.reuters.com/business/finance/many-small-us-banks-not-ready-borrow-fed-an-emergency-2023-08-02/; https://www.wsj.com/articles/SB10001424052748703518704576258993132298396.

came as a surprise to some observers."

In addition, recent research has shown that after the Global Financial Crisis, some banks start to access the DW as their main liquidity management resource in regular times as well, with large loan amounts concentrated during periods of rapid growth despite ample collateral and profitability (e.g., Ennis, Ho, and Tobin, 2019; Ennis and Klee, 2021). In our replication, Figure 3 depicts the level of DW loan activities on a quarterly basis from Q3 of 2010 to Q3 of 2022 at the U.S. level. The figure shows heightened activity during stress periods such as early 2020 and early 2022, as anticipated, and also reveals significant activity and time variation during non-stress periods. In a typical year before 2020, Reserve Banks extended around $6.5 billion in DW credit, compared to approximately $221 billion in DW loans during 2020. Appendix Figure B.1 also demonstrates substantial cross-district variation. The variation in DW activities over time and across districts is valuable for our study.

[Insert Figure 3 here]

We advance the possibility that the supply of credit might be influenced by Reserve Banks' consideration of local economic conditions, hence serving as one channel for local monetary policy. One potential mechanism is that Reserve Banks may adjust their stance on a district borrower's solvency when deciding whether to approve a DW loan. As noted in a *Wall Street Journal* article from September 12, 2008: "*Any borrower to the Discount Window must put up collateral that the Fed values on its own before making the loan. The Fed could decide not to put government money at risk by lending to a seriously troubled firm even against collateral.*"[11]

The DW literature has coined the term "Discount Window Stigma" to describe a condition where accessing the DW is interpreted as a sign of financial weakness (see, e.g., Armantier, Ghysels, Sarkar, and Shrader (2015) and Beyhaghi and Gerlach (2023)). This concept is less concerning for our empirical design because it is unlikely

[11]Source: https://www.wsj.com/articles/BL-REB-1952.

that variations in this stigma perfectly align with FOMC voting status and local economic conditions both over time and across districts. Moreover, while stigma may be a factor influencing bank applications for DW loans, it is unlikely to be a significant driver of Reserve Banks' loan decisions.

In summary, the Discount Window remains one of the few central bank tools under *direct* control of Reserve Banks, making it a suitable gauge for our local monetary policy hypothesis. Its usage is measurable, comparable across districts and time, and should reflect local policy discretion if LMP exists.

3.2 Identification Strategy

In this section, we describe the strategy we use to identify actions taken by Reserve Banks in response to local conditions; we call these actions local monetary policy (LMP). As a proxy for potential actions taken by Federal Reserve Banks, we use loan quantities extended via Discount Windows.

Any attempt to identify the existence of LMP faces the following challenges. *First*, we need to have measurable variation in the incentives of Federal Reserve Banks to rely on LMP rather than national monetary policy. *Second*, we need to identify the actions taken by Federal Reserve Banks, as loan quantities are jointly determined by the Reserve Banks (supply) and the borrowers (demand). *Third*, we need to isolate the variation in local economic conditions that is not driven by aggregate conditions.

To address the first challenge, we use the exogenous yearly FOMC voting rotation. This variation *separates* observations at the district-time level in which Federal Reserve Banks can react to changes in local economic conditions by affecting aggregate FFR decisions (i.e., the voting sample) *and* observations for which such a tool is less effective (i.e., the non-voting sample). Fos and Xu (2025) provide evidence for the former case, showing that when cross-district dispersion in economic conditions is large, voting district economic conditions significantly affect FFR decisions while non-voting district economic conditions do not, controlling for aggregate information and expectations. In general, voting status gives the district access to this national tool.[12] To validate the exogeneity of the FOMC rotation in our framework, Table 2 shows that a Reserve Bank's voting status is uncorrelated with recent past local economic conditions and loan activities, whether measured at the end of Q4 or as last year's aggregate.

[Insert Table 2 here]

To address the aforementioned second challenge, we include liquidity loans that are not controlled by Federal Reserve Banks, such as FHLB and REPO loans. While these liquidity loans are often used by borrowers to manage liquidity needs, Federal Reserve Banks do not have a direct impact on whether a borrower receives such a loan. By focusing on the differential responses of DW loans and other on-demand liquidity loans to changes in local economic conditions, we can isolate the incremental effect of Federal Reserve Banks on DW loans.

To address the third challenge, we use granular sets of fixed effects. Specifically, we use district-by-time fixed effects to absorb the variation resulting from changes in local economic conditions (and hence also national economic conditions). This allows us to better compare DW and other liquidity loan activities within district-time. Importantly, by creating a stacked sample of various liquidity loans we can also include borrower-by-time fixed effects to absorb variations due to changes in a borrower's characteristics. The inclusion of this set of fixed effects ensures that the estimates are not driven by changes in banks' liquidity needs (i.e., demand for liquidity).

[12] Conceptually, a district's voting status does not guarantee that the resulting FFR decision aligns with its local economic conditions. To explore this further, we considered focusing on cases of dissent among voting districts; however, there are only 25 such cases in our sample period (2010-2022).

4 Results

In Section 4.1, we examine the unconditional relationship between local economic conditions and liquidity loans. Our main findings on LMP are presented in Section 4.2. In Section 4.3, we discuss several robustness tests.

4.1 Unconditional Results

We start by examining the unconditional relationship between local inflation and liquidity loans at the borrower-quarter level for DW and FHLB loans separately. Here, i represents borrower banks, j or $j(i)$ represents the Federal Reserve district of the borrower bank, and t represents quarters. We estimate the following regressions:

$$Y_{ijt}^{DW} = \theta_i^{DW} + \gamma_t^{DW} + \beta_{Infl}^{DW} \times \text{Infl}_{jt-1} + \beta_{UR}^{DW} \times \text{UR}_{jt-1} + \epsilon_{ijt}^{DW}, \tag{1}$$

$$Y_{ijt}^{FHLB} = \theta_i^{FHLB} + \gamma_t^{FHLB} + \beta_{Infl}^{FHLB} \times \text{Infl}_{jt-1} + \beta_{UR}^{FHLB} \times \text{UR}_{jt-1} + \epsilon_{ijt}^{FHLB}, \tag{2}$$

where, as discussed in Section 2.2, Y_{ijt}^{DW} denotes the total amount of new DW loans and Y_{ijt}^{FHLB} denotes the quarterly change in quarter-end FHLB balances for a borrower-district-quarter $\{ijt\}$. Both are scaled by the total asset amount of borrower i at the end of the previous quarter. On the right-hand side, Infl_{jt-1} (UR_{jt-1}) is the weighted average local inflation (unemployment rates) in the first and second months of each quarter. θ_i represents borrower fixed effects. γ_t represents time fixed effects, which absorb aggregate outcomes (e.g., FFR, macro variables, macro variables in voting districts). The coefficients of interest are β^{DW} and β^{FHLB}.

Panels A and B of Table 3 present regression results for Equations (1) and (2), respectively. Columns (1) through (4) in Panel A show that when we use within-district variation, there is a negative (positive) and significant relationship between DW loan activity and local inflation (UR). Higher local inflation or lower local unemployment is associated with reduced Discount Window borrowing. Specifically, in Column (3) the -0.085^{***} coefficient for local inflation means that a one standard deviation (SD) increase in local inflation leads to a 0.030% decrease in the fraction of DW loans as a percent of a bank's assets, which is sizable as the average is 0.110% (see Table 1, Panel A(1)). Similarly, the 0.038^{**} coefficient for local UR means that a one SD increase in local UR leads to a 0.087% increase in the fraction of DW loans. Columns (5) and (6) in Panel A show that the relationship remains negative (positive) for local inflation (UR), though less significant, when the regression includes time-varying borrower characteristics (such as size, regulatory requirements, returns, and financial risk exposure), when we use within-borrower variation, and when the New York district is excluded from the sample.[13]

[Insert Table 3 here]

The results in Panel B indicate that the relationship between FHLB loans and local inflation (UR) is significant and positive (negative). The main coefficients of interest stabilize in Column (4) across different specifications of fixed effects and control variables. A one SD increase in local inflation (UR) is associated with a 0.026% increase (0.032% decrease) in the FHLB fraction of a bank's total assets. The directional effects for both inflation and unemployment in Panel B are consistent with a loan demand story; that is, deteriorating macroeconomic conditions are associated with reduced loan demand. This stands in sharp contrast to the patterns observed in Panel A.

The model explanatory power in FHLB regressions is overall slightly weaker than it is in DW regressions. This is expected for two reasons. First, these FHLB loans often mature after 3 months, causing less variation in the quarterly changes to exploit. Second, while we observe the timing of DW loan arrivals, the most detailed data available for FHLB loans are quarterly snapshots, resulting in a noisier measurement of FHLB loan activity.

[13] The New York Fed is special, given its unique role in providing emergency liquidity (e.g., operating the Primary Dealer Credit Facility (PDCF) in 2008) and its strategic position within the Federal Reserve System (e.g., always voting at the FOMC). It is plausible that the incentives of the New York Fed could be different from other Reserve Banks.

Next, we formally test the difference between β^{DW} and β^{FHLB}. We stack the two samples (doubling the number of observations), use l to denote the loan type (i.e., DW or FHLB), and estimate the following regression:

$$
\begin{aligned}
Y_{ijtl} = {} & \gamma_t \times \omega_l + \gamma_t \times \phi_j + \theta_i \times \omega_l + \beta_{Infl} \times \mathbf{1}_{l=DW} \times \text{Infl}_{jt-1} \\
& + \beta_{UR} \times \mathbf{1}_{l=DW} \times \text{UR}_{jt-1} + \epsilon_{ijtl},
\end{aligned} \tag{3}
$$

where $\mathbf{1}_{l=DW}$ represents a loan type indicator that equals one if the loan type is DW. Therefore, β captures the difference in the sensitivities between the two types of loans, DW and FHLB, in response to local economic conditions. In this specification, $\gamma_t \times \omega_l$ absorbs aggregate time trends (e.g., FFR, U.S. inflation and UR, inflation in voting districts, and so on) as well as differential aggregate time trends for the types of loans. Furthermore, in some more restrictive specifications, we include $\gamma_t \times \phi_j$ to absorb any time-by-district variation.

Table 3, Panel C, presents the regression results. Our research focuses on the double interaction coefficients reported in the first and second rows. These coefficients are negative and significant across most specifications for local inflation, and positive and significant across all specifications for local unemployment rates. Columns (1) though (3) control for aggregate time variation and borrower variation in loan types. Column (4) adds other borrower bank control variables as listed in Appendix Table A.1). Column (5) reflects the estimation results of Equation (3) with added borrower-time fixed effects. This further controls for demand and other bank characteristics that vary with borrower-time. Column (6) drops the New York district. The main result remains intact, in terms of both economic magnitude and statistical significance. Given a one SD increase in local inflation (UR), the differential response of DW%Assets and FHLB%Assets widens and grows to be more negative by around -0.051% (more positive by around 0.105%).

These results provide the initial evidence that Discount Window loans respond to local inflation and UR significantly and differently from FHLB loans. The overall positive (negative) response of FHLB loans to inflation (UR) suggests that when local inflation (UR) increases (decreases), borrowers demand more liquidity to expand and grow. In contrast, the overall negative (positive) response of DW loans to inflation (UR) indicates the existence of a counteracting force. In our paper, we propose that a *supply* mechanism could explain this relationship: as local inflation (UR) increases (decreases), Reserve Banks may restrict the supply of Discount Window loans to depository borrowers, thereby tightening local economic conditions. For example, Reserve Banks might change their assessment of a borrower bank's solvency when deciding whether to approve a DW loan. Such mechanism has been speculated in media discussion (see Section 3.1).

4.2 Local Monetary Policy and FOMC Voting

To test for the existence of Local Monetary Policy (LMP), we use the exogenous FOMC voting rotation to separate a subsample for which local economic needs can be addressed through FFR decisions (i.e., when a district has a voting seat) and another subsample for which this national mechanism is available to a smaller degree (i.e., when a district does not have a voting right). Panel A in Table 4 considers the borrower-quarters when the corresponding districts have voting rights. Because the president of the New York district always votes, we consider specifications without the New York district in the rest of our analysis. Across all columns, the insignificant interaction coefficients for both macro variables indicate that DW and FHLB loans do not exhibit significantly different responses to local economic conditions.

[Insert Table 4 here]

Panel B in Table 4 presents the results using borrower-quarters when the corresponding districts do not have voting rights. Across all specifications, the interaction between the DW loan dummy and local inflation (UR) is negative (positive) and significant at the 1% level. The coefficients are notably larger—nearly twice as large—as those reported in Column (6) of Panel C in Table 3. In terms of economic magnitude, an estimate of -0.314^{***} in Column (3), Panel B, indicates that a one SD increase in local inflation leads to around a -0.112% (more negative) response in DW%Assets compared to FHLB%Assets. Similarly, an estimate of 0.068^{***} in Column (3) indicates that a one SD increase in local UR leads to around a 0.157% (more positive) response in DW%Assets compared to FHLB%Assets. For the full sample, these magnitudes are -0.051% and 0.105%, as discussed above. This sharply contrasts with Panel A of Table 4, suggesting that the lack of FOMC voting rights triggers the usage of local tools to respond to local inflation and UR.

Next, we formally test whether the double interaction coefficient in the non-voting subsample differs significantly from that in the voting subsample. When a district lacks voting rights at FOMC meetings, we expect local inflation and UR to have a limited impact on national monetary policy (e.g., the FFR), allowing local monetary policy to emerge. The evidence is reported in Table 5. We find negative (positive) and significant coefficient estimates for inflation (UR) for the triple interaction terms. Column (3) is our main LMP specification in the rest of the paper.

[Insert Table 5 here]

4.3 Robustness

In this section, we present several robustness tests using our main LMP specification (Column (3) in Table 5) as the baseline specification. Our main sample covers all financial institutions included in Call Reports, and therefore could include borrowers who do not use DW or FHLB loans. In the first robustness test, we therefore verify that the results are not driven by banks that do not use DW or FHLB loans. Table 6 presents the results. Column (1) is the baseline specification, i.e., Table 5's

Column (3). Column (2) ((3)) shows that if we require borrowers to use DW or (and) FHLB loans, the main coefficient increases from -0.351^{***} to -0.428^{***} (-0.540^{***}) and remains statistically significant. Similarly, the triple interaction coefficient for UR remains positive and significant across the specifications.

[Insert Table 6 here]

In the second robustness test, we use the second month's inflation or unemployment rates only. The FOMC meets approximately eight times a year, with meetings typically occurring at the end of the first month and the middle of the last month within a quarter, as shown in Figure 4. As a result, the first month's macro variable may have already been addressed, making the second month's macro variable a relatively more "pure" source of information for quarter-end DW transaction decisions. Table 7 replicates our main results using only the second month's inflation or unemployment rates to proxy for the district macro variable. The results are qualitatively and quantitatively similar to the results based on the main specification.

[Insert Figure 4 here]

[Insert Table 7 here]

In the next robustness test, we assess the influence of individual districts. Table 8 sequentially excludes one district at a time in addition to New York from the main panel and re-estimates the primary triple interaction coefficient of interest (Table 5, Column (3)). Column (2) in Panel A reports the main result coefficient (-0.351***), corresponding to the sample without New York district observations. In general, we find that our results for inflation do not change and remain robust across columns, in terms of both statistical significance and economic magnitude. The coefficients for unemployment rates remain positive and significant across all specifications, except when we drop Boston district. One interpretation of this finding is that Boston district is reacting more aggressively than other districts to changes in local unemployment rates.

[Insert Table 8 here]

We also analyze subsamples with high macro variable dispersion as a proxy for greater policy attention to particular macroeconomic variables. Figure 5 shows the time variation in inflation and unemployment rate (UR) wedges, plotted in blue with circle markers. Following Fos and Xu (2025), we define the inflation wedge as the max-min spread of local inflation across districts, scaled by the national inflation level over the prior three years. Subsamples for high and low dispersion periods are based on the median value. The UR wedge is constructed similarly.

We find that high inflation dispersion periods (above the median) are spread throughout the sample. Notably, peaks in inflation dispersion occur in 2015-2016 and again in 2020, corresponding to different district voting rotations. Both episodes coincide with elevated local inflation. Indicating heightened policy attention to inflation during those times, inflation mentions in FOMC meetings (see Figure 5 for detailed construction notes) correlate strongly with inflation dispersion ($\rho = 0.66$). In contrast, from (B) in Figure 5, the UR wedge is on average eight times smaller than the inflation wedge, shows little time-series variation, and lacks validation from FOMC transcript mentions. Moreover, the high UR dispersion period coincides with periods with heightened DW activity (see Figure 3), which makes the interpretation of the high UR dispersion period difficult. For these reasons, we rely primarily on the inflation wedge for sample splits, while still reporting UR wedge results for completeness.

[Insert Figure 5 here]

In Table 9's Columns (1)-(2), we examine whether our results are more pronounced when cross-district inflation dispersion is. We find that results are driven by high (i.e., above median) local inflation dispersion periods. This finding is intuitive, as we expect a district's voting status to be less important when inflation is similar across districts. The inflation level during our sample period has been stable and the results are quite robust if we use the unscaled inflation wedge variable to generate the high and low wedge periods (see Appendix Table B.6). Columns (3) and (4) report the results for the UR wedge.

[Insert Table 9 here]

Next we compare sample periods with high versus low DW activity. Local monetary policy can only exert influence when there is demand for DW loans. We split the sample period into periods with heightened aggregate DW activity (i.e., stress periods) and the remainder. Based on Figure 3, we consider the post-2020 period as a period of high volume DW activity. The results are reported in Table 10 and indicate a stronger role for local monetary policy when the volume of DW applications is likely high.

[Insert Table 10 here]

The results of additional robustness tests are reported in the Internet Appendix. While both types of loans address borrowers' liquidity needs, FHLB loans are provided by a local federal lender whereas REPO loans are provided by national markets. In Appendix Table B.3, we use REPO%Assets within the quarter instead of changes in FHLB balances. The three columns consider the full sample, borrowers with access to either, and borrowers with access to both, respectively. We find quantitatively similar coefficient estimates. Further, Internet Appendix Table B.4 demonstrates that our results are robust if we include DW test loans when calculating borrower-quarterly total DW loans. The fact that not all test loans are of the same amount (i.e., \$1000, \$10k or \$100k) is interesting because test loans could potentially be informative about what Reserve Banks want. Internet Appendix Table B.5 replicates our main results if we do not include seasonal loans, which should be strictly sensitive to seasonal effects rather than local economic conditions. Internet Appendix Table B.6 replicates the dispersion results using unscaled macro wedges.

5 Economic Implications

In the previous sections, we established the existence of local monetary policy (LMP). The analyses used two important facts: Federal Reserve Banks have full oversight in determining DW loan quantities, and granular Discount Window data is publicly available from 2010 on. Whereas the evidence of LMP comes from Discount Window lending, Reserve Banks may employ mechanisms that are harder to measure.

In this section, we study whether LMP leads to changes in commercial bank lending. Specifically, we ask whether commercial bank lending activities respond to local economic conditions in a way that is consistent with the existence of LMP. Importantly, we do not take a stance on whether this real effect is due to the Discount Window channel of local monetary policy or any other channel used by Reserve Banks.

We estimate the following regression:

$$
\begin{aligned}
Y_{ijtl} = {} & \gamma_t \times \phi_i + \gamma_t \times \omega_l + \phi_i \times \omega_l + \beta_{infl} \times \text{No Vote}_{jt} \times \mathbf{1}_{l=Type(1)} \times \text{Infl}_{jt-1} \\
& + \beta_{UR} \times \text{No Vote}_{jt} \times \mathbf{1}_{l=Type(1)} \times \text{UR}_{jt-1} \\
& + \beta_1 \times \mathbf{1}_{l=Type(1)} \times \text{UR}_{jt-1} + \beta_2 \times \mathbf{1}_{l=Type(1)} \times \text{Infl}_{jt-1} + \epsilon_{ijt},
\end{aligned} \tag{4}
$$

where Y_{ijtl} is the change in loan issuance balances as a percent of last quarter-end assets for bank i in district j for quarter t. We use l to identify the type of loan issued by commercial banks. Mirroring the main specification outlined in Table 5, we stack two types of loans issued by borrower banks: Type (1) loans are constructed by summing commercial and industrial loans (C&I) with non-residential real estate loans (NRRE); type (2) loans are residential real estate loans (RRE). This categorization is motivated by the fact that the FHLB system is expressly tasked with facilitating liquidity in the mortgage market. As such, the Type (2) loans are directly supported by FHLB loans. Type (1) loans, on the other hand, are outside the purview of FHLBs. This classification leads to a differential exposure of borrower-banks' lending activity to local monetary policy enacted through Reserve Banks. Empirically, we take advantage of this setting by introducing a dummy variable, $\mathbf{1}_{l=Type(1)}$, that equals one if the loan is type (1) and zero otherwise. We interact $\mathbf{1}_{l=Type(1)}$ with measures of local economic activity (Infl_{jt-1} and UR_{jt-1}) and the exogenous rotation of FOMC voting rights (No Vote_{jt}). The coefficients of interest β_{infl} and β_{UR} measure the differential response of borrower-banks' expansion of credit to households vis-a-vis firms in response to local monetary policy.

Table 11 presents the results. We find that higher local inflation or lower local unemployment – an overheated condition – are associated with a significantly greater reduction in non-FHLB-supported loans when a district lacks voting rights compared to when it holds them. In terms of the economic magnitude, a one SD increase in local inflation leads to a 0.059% decrease in quarterly loan changes (as % assets), which is sizable given a median quarterly change is 0.095% and an average quarterly change is 0.474%.

[Insert Table 11 here]

These results add to the main previous finding on the existence of local monetary policy by showing that such local policy can have real effects on local businesses through commercial bank lending decisions. Specifically, when tightening local conditions are present, characterized by an overheated economy and lack of FOMC voting rights, banks reduce their issuance of commercial, industrial, and non-real estate loans to local businesses. Taken together, our findings further underscore the effectiveness of local monetary policy.

6 Conclusion

In this paper, we show that when Federal Reserve districts experience high inflation or a low unemployment rate but lack voting rights to influence FOMC decisions, credit extended to commercial banks through the Discount Window (DW) declines. Our identification strategy is based on the exogenous rotation of voting rights among Reserve Banks and on within borrower-time and district-time variation in DW loans and Federal Home Loan Bank (FHLB) loans, implying that factors related to changes in macroeconomic conditions, local credit demand, or borrower characteristics do not drive the results. The effect on bank funding sources translates into changes in the composition of loans extended by commercial banks.

Our findings point to several important questions for future research. To what degree are Federal Reserve Banks effective in closing the gap between national monetary policy and the interests of their districts? Would studying district-level Taylor rule regressions help with our understanding of the full effectiveness of U.S. monetary policy? Does the tension between national and local monetary policies have implications for the stability of financial markets and asset prices? Answers to these questions will both contribute to academic research and be useful for policymakers.

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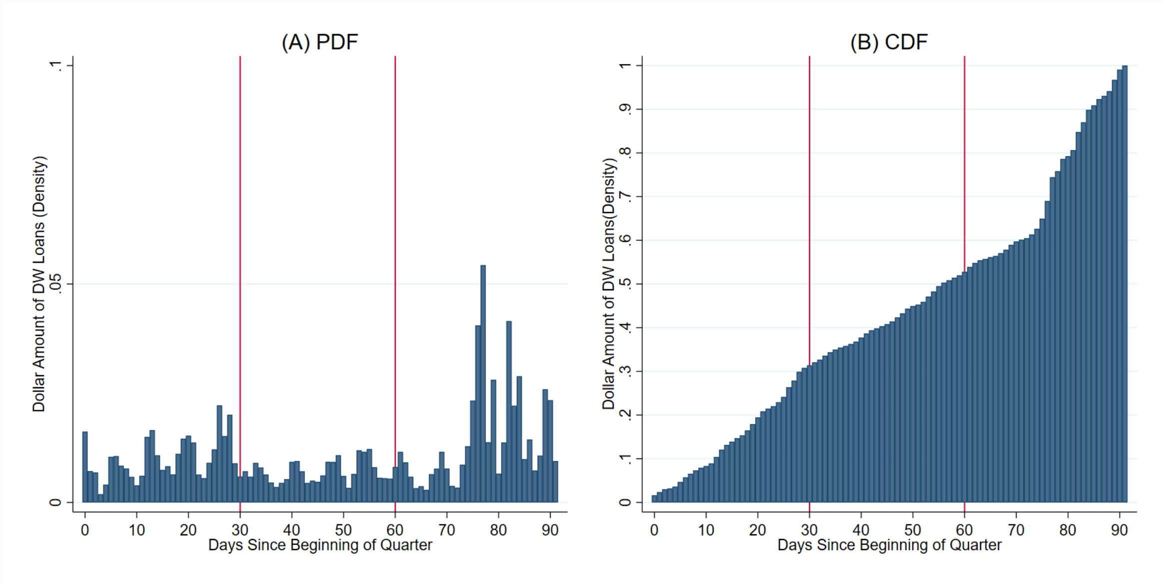


Figure 1: **The timing of Discount Window (DW) loans.** This figure shows the daily fraction of the total dollar amount of Discount Window loans extended in a typical quarter between Q3/2010 and Q3/2022. The y-axis is the partial (Panel A) or cumulative (Panel B) percentage of quarterly Discount Window credit extended on a given day. The x-axis is the number of days since the beginning of each quarter.

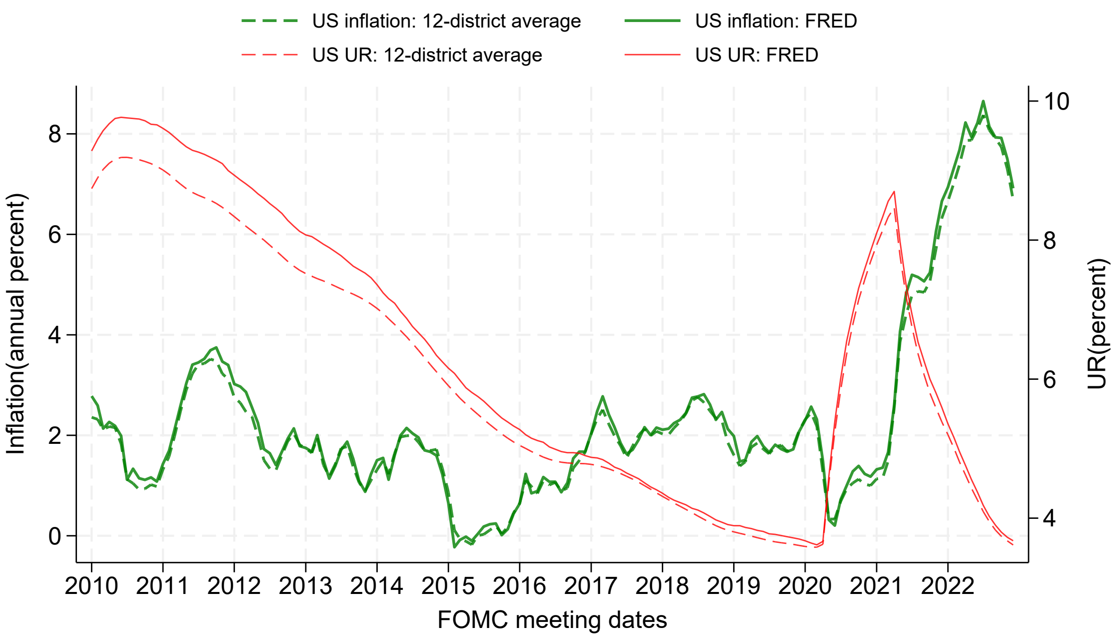
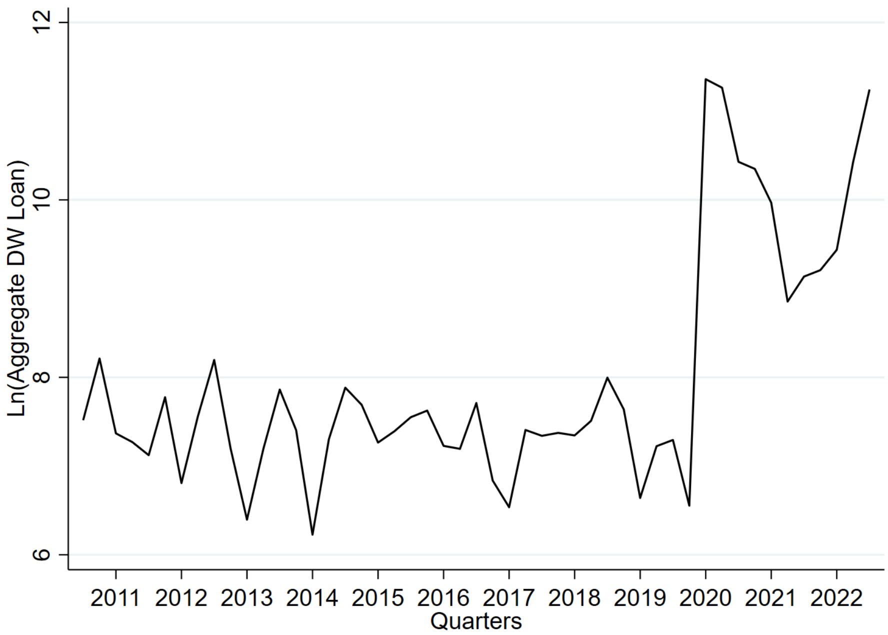


Figure 2: **Time series of key macro variables.** This figure depicts our major aggregate time series to visualize our data quality. The two thicker green lines (left y-axis) depict the time series of yearly U.S. inflation measures (unit: annual percent); the dashed green line is the 12-district average of yearly inflation rates, based on our district-level inflation construction (source: BLS, authors' calculations), while the solid green line is the yearly U.S. inflation computed using the available aggregate CPI series (source: FRED). The two inflation series are 99.82% correlated. Similarly, the two thinner red lines (right y-axis) depict the time series of U.S. unemployment rates (unit: percent); the dashed red line is the 12-district average of yearly unemployment rates (source: BLS, authors' calculations), and the solid red line is the yearly U.S. UR (source: FRED). The two inflation series are 99.90% correlated.

(A) Log Amount of Discount Window Loans



(B) Dollar Amount of Discount Window Loans

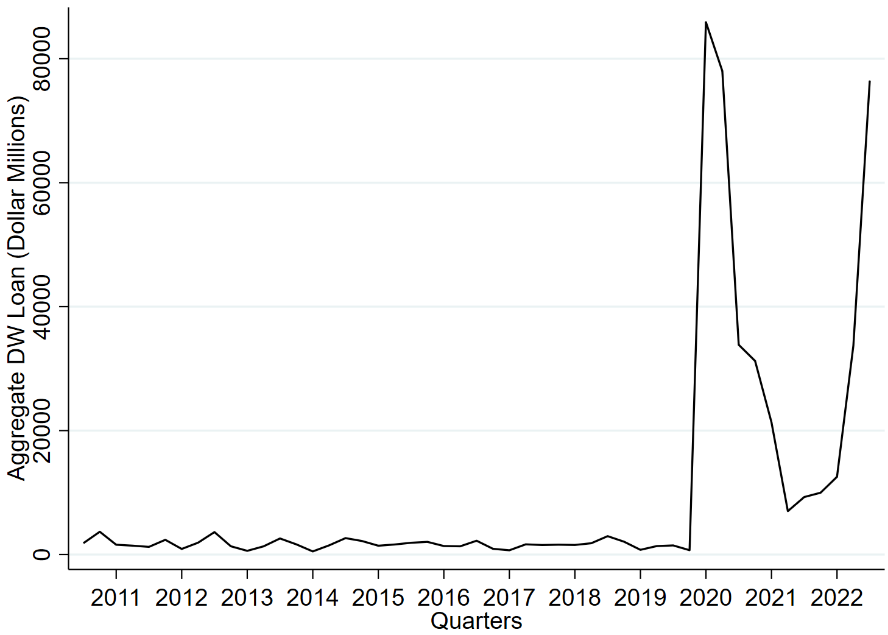
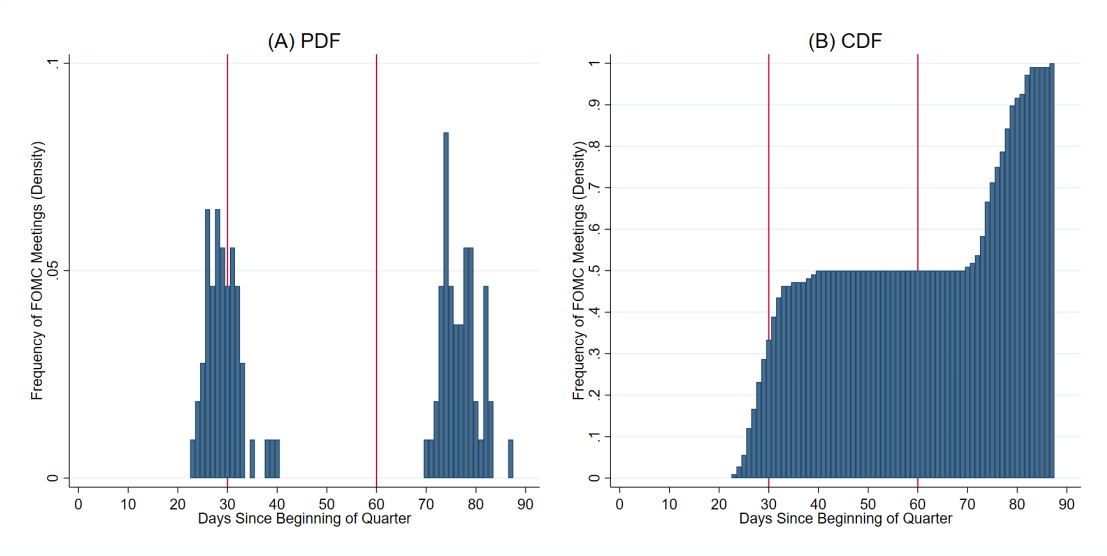


Figure 3: **DW activities at the national level using DW loan-level data.** This figure summarizes all Discount Window loans at a quarterly frequency. Panel (A) plots the natural logarithm of the total dollar amount for each year-quarter from Q3/2010 to Q3/2022. Panel (B) plots the raw dollar amount. The district-by-district plots are shown in Appendix Figure B.1.

(A) When do FOMC meetings happen within a quarter?



(B) When do FOMC meetings happen within a year?

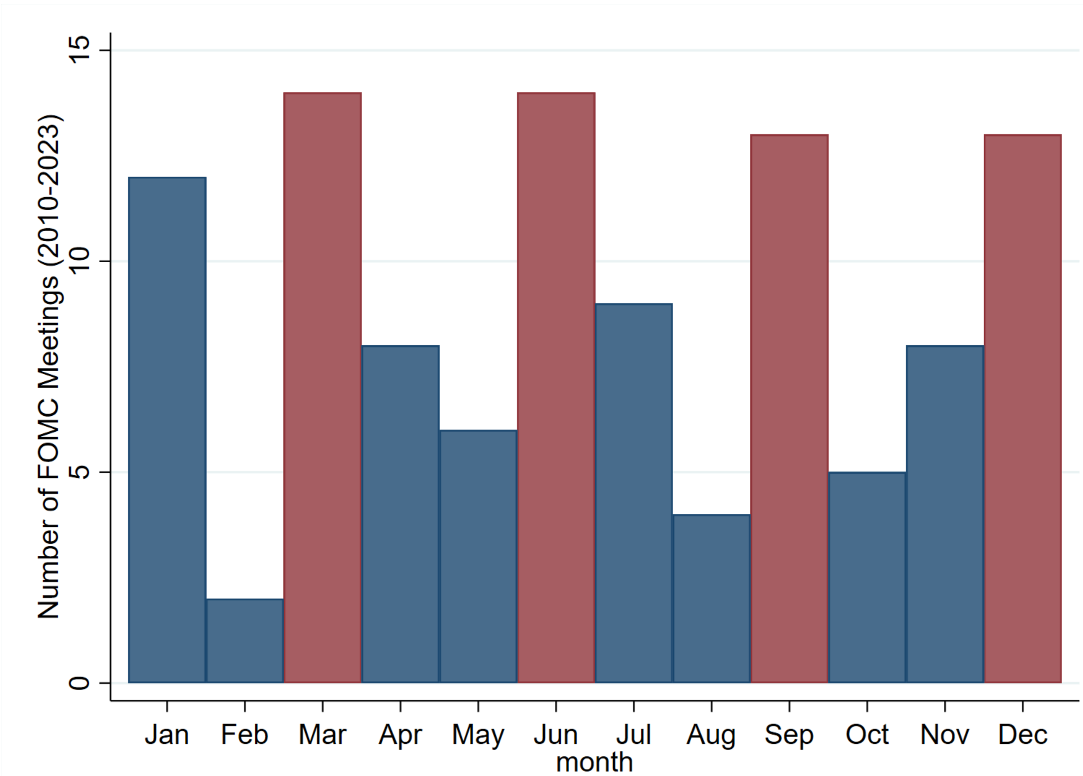
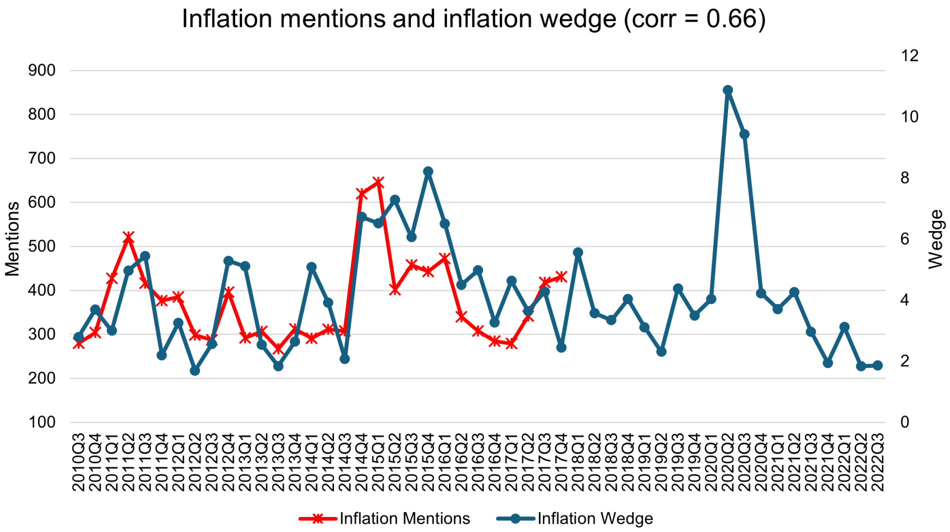


Figure 4: **The timing of FOMC meetings.** Panel A shows the daily fraction of the total number of FOMC meetings held in a typical quarter. The y-axis is the partial (left) or cumulative (right) fraction of the quarterly number of FOMC meetings held on a given day. The x-axis is the number of days since the beginning of each quarter. Panel B shows the number of FOMC meetings held in each calendar month. The sample covers Q3/2010-Q3/2022.

(A)



(B)

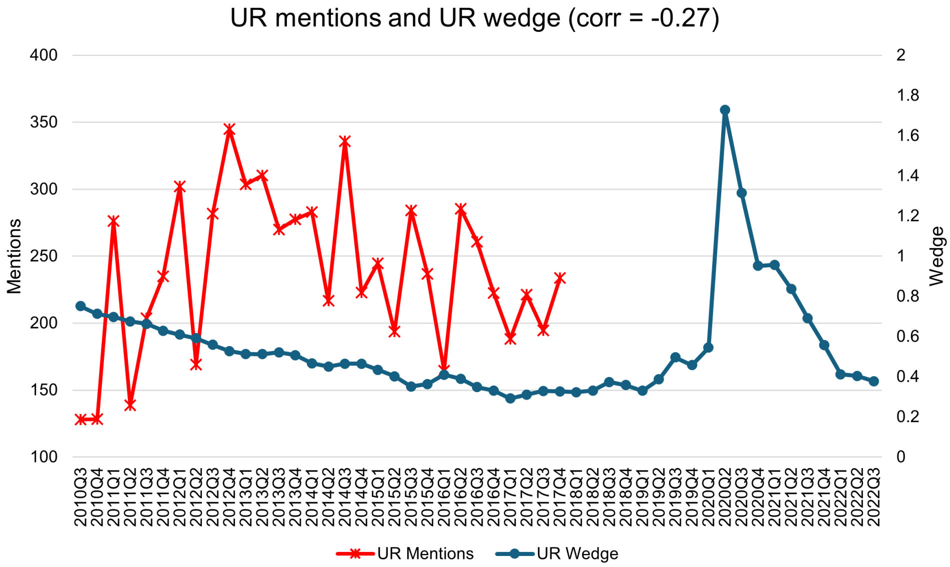


Figure 5: **Wedge variables (2010-2022) and textual analysis of FOMC transcripts (2010-2017).** This figure compares the time series of our macro wedge variables as used in Table 9 (see right y-axis) and their word mentions in FOMC transcripts (see left y-axis). To construct the macro mentions at FOMC meetings, we opt for a simple method that averages the total word mentions of keywords across all meetings within a calendar quarter (typically 2 meetings per quarter). Inflation keywords include {inflation, deflation, cpi, oil, consumer price, consumer spending, price index, housing, rental} and their obvious variants. Unemployment rate keywords include {unemployment, jobless, employment, labor, job cut, homeless} and their obvious variants. Appendix Figure B.2 shows mentions of other macro variables at FOMC meetings for comparison. The overlapped sample ends in 2017 due to the 5-year delay in the release of FOMC transcripts.

Table 1: **Summary statistics.** This table reports summary statistics for the datasets used in this paper. The sample covers all banks that filed Call Reports between Q3/2010 - Q3/2022. Detailed descriptions of the variables are provided in Section 2. Variables in Panels A(1)-A(3) are the main independent and dependent variables used in Tables 3-10. Variables in Panels B are used in Table 11.

	COUNT	MEAN	SD	P1	P5	P25	P50	P75	P95	P99
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A(1). Borrower-Quarter level; All district-quarters										
DW Loan % Assets	287792	0.110	2.663	0.000	0.000	0.000	0.000	0.000	0.000	1.128
Chg FHLB % Assets	294890	0.036	3.064	-4.770	-1.739	0.000	0.000	0.000	1.971	5.311
REPOs % Assets	295669	0.922	4.336	0.000	0.000	0.000	0.000	0.000	5.240	14.343
Local Inflation	246784	0.204	0.356	-0.620	-0.357	-0.039	0.170	0.420	0.918	1.125
Local UR	295669	5.858	2.284	2.500	3.100	4.050	5.400	7.100	10.050	12.350
No Vote	295669	0.605	0.489	0.000	0.000	0.000	1.000	1.000	1.000	1.000
Panel A(2). Borrower-Quarter level; District-quarters without voting rights (60.5%)										
DW Loan % Assets	173904	0.120	2.842	0.000	0.000	0.000	0.000	0.000	0.000	1.232
Chg FHLB % Assets	178451	0.042	3.736	-4.797	-1.721	0.000	0.000	0.000	1.987	5.366
REPOs % Assets	178848	0.903	3.938	0.000	0.000	0.000	0.000	0.000	5.148	14.232
Local Inflation	147494	0.197	0.357	-0.790	-0.357	-0.031	0.139	0.420	0.875	1.175
Local UR	178848	5.822	2.306	2.700	3.100	4.000	5.400	7.100	10.200	12.400
Panel A(3). Borrower-Quarter level; District-quarters with voting rights (39.5%)										
DW Loan % Assets	113888	0.095	2.362	0.000	0.000	0.000	0.000	0.000	0.000	0.990
Chg FHLB % Assets	116439	0.026	1.541	-4.737	-1.767	0.000	0.000	0.000	1.943	5.203
REPOs % Assets	116821	0.952	4.883	0.000	0.000	0.000	0.000	0.000	5.347	14.498
Local Inflation	99290	0.214	0.353	-0.510	-0.324	-0.045	0.216	0.430	0.918	1.090
Local UR	116821	5.913	2.247	2.400	3.000	4.100	5.400	7.250	9.800	11.000
Panel B. Borrower-Quarter level real effects; All district-quarters										
Chg C&I + NRRE % Assets (Type (1))	290851	0.474	3.702	-4.157	-2.005	-0.425	0.094	0.945	3.537	8.613
Chg RRE % Assets (Type (2))	294890	0.447	17.645	-3.904	-1.893	-0.445	0.157	0.984	3.104	7.358

Table 2: **Exogenous Federal Reserve district voting rotation.** This table reports evidence on the exogeneity of FOMC voting rights with respect to the main explanatory and outcome variables used in our study. Panel A reports the results using only aggregate data from the last quarter of the previous year. Panel B reports the results using cumulative yearly data. “Local Inflation” (“Local UR”) is the inflation rate (unemployment rate) during an indicated time frame (see panel hedaer) of a given Reserve Bank district; “DW Activity” (“FHLB Activity”) is the aggregate amount of all DW (FHLB) credit extended to commercial banks by a Reserve Bank, scaled by the total amount of commercial banks’ assets in that district. The number of observations for Column (1) is slightly smaller due to missing local inflation data from several districts prior to 2017. Robust t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Panel A. Last quarter information

Dependent variable: 1=District Voting Next Year; 0=Otherwise							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local Inflation	-0.317				-0.311	-0.231	-0.309
	(-1.121)				(-1.037)	(-0.631)	(-0.411)
Local UR		0.016			0.015	0.004	-0.030
		(0.365)			(0.304)	(0.093)	(-0.162)
DW Activity			0.300		0.309	0.302	0.311
			(1.295)		(1.435)	(1.481)	(1.155)
FHLB Activity				0.155	0.122	0.050	0.057
				(1.344)	(0.998)	(0.369)	(0.373)
N	116	132	132	132	116	116	116
R^2	0.01	0.00	0.01	0.01	0.02	0.18	0.18
District FEs	NO	NO	NO	NO	NO	YES	YES
Time FEs	NO	NO	NO	NO	NO	NO	YES

Panel B. Last year information

Dependent variable: 1=District Voting Next Year; 0=Otherwise							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Local Inflation	-0.008				-0.016	-0.003	0.009
	(-0.136)				(-0.252)	(-0.037)	(0.066)
Local UR		0.016			0.023	0.015	0.087
		(0.804)			(0.922)	(0.543)	(1.061)
DW Activity			-0.025		-0.056	-0.057	-0.027
			(-0.432)		(-1.000)	(-0.716)	(-0.254)
FHLB Activity				-0.045	-0.028	-0.051	-0.074
				(-0.719)	(-0.385)	(-0.690)	(-0.702)
N	106	132	120	120	106	106	106
R^2	0.00	0.01	0.00	0.16	0.01	0.18	0.19
District FEs	NO	NO	NO	YES	NO	YES	YES
Time FEs	NO	NO	NO	NO	NO	NO	YES

Table 3: **The unconditional relationship between local inflation and liquidity loans.** Panels in this table report estimates of Equations (1), (2), and (3), respectively. Panel A reports the results of using only quarterly cumulative DW loans as the dependent variable. Panel B reports the results of using only quarterly changes in FHLB advances as the dependent variable. Panel C reports the results of using a stacked sample, where DW becomes a dummy that identifies Discount Window credit. Bank-level control variables include the natural logarithm of a bank's assets, Tier 1 capital ratio, ROA, total deposits as a fraction of total liabilities, and commercial and industrial loans as a fraction of a bank's assets. All control variables are lagged by one quarter. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Panel A

Dependent variable: DW Loan % Assets	(1)	(2)	(3)	(4)	(5)	(6)
Local Inflation	-0.093***		-0.085***	-0.073	-0.079*	-0.071
	(-2.690)		(-2.581)	(-1.585)	(-1.731)	(-1.533)
Local UR		0.037**	0.038**	0.040*	0.038	0.032
		(2.410)	(2.048)	(1.860)	(1.531)	(1.169)
N	240,802	287,792	240,802	219,011	218,925	210,005
R^2	0.00	0.00	0.00	0.00	0.19	0.19
Time FEs	YES	YES	YES	YES	YES	YES
District FEs	YES	YES	YES	YES	NO	NO
Borrower FEs	NO	NO	NO	NO	YES	YES
Controls	NO	NO	NO	YES	YES	YES
NY Excluded	NO	NO	NO	NO	NO	YES

Panel B

Dependent variable: Chg FHLB % Assets	(1)	(2)	(3)	(4)	(5)	(6)
Local Inflation	0.003		0.001	0.074***	0.076***	0.072***
	(0.031)		(0.011)	(3.670)	(3.766)	(3.455)
Local UR		-0.007	-0.008	-0.014***	-0.012**	-0.009
		(-0.872)	(-0.861)	(-3.199)	(-2.126)	(-1.532)
N	246,100	294,890	246,100	219,011	218,925	210,005
R^2	0.00	0.00	0.00	0.01	0.04	0.04
Time FEs	YES	YES	YES	YES	YES	YES
District FEs	YES		YES	YES	NO	NO
Borrower FEs	NO	NO	NO	NO	YES	YES
Controls	NO	NO	NO	YES	YES	YES
NY Excluded	NO	NO	NO	NO	NO	YES

Panel C

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)	(4)	(5)	(6)
DW × Local Inflation	-0.174***		-0.166***	-0.152***	-0.152***	-0.142***
	(-4.529)		(-4.444)	(-3.094)	(-3.094)	(-2.815)
DW × Local UR		0.050***	0.054***	0.054**	0.054**	0.046*
		(2.947)	(2.749)	(2.100)	(2.100)	(1.655)
Local Inflation	0.009		0.006	0.074***		
	(0.125)		(0.083)	(3.675)		
Local UR		-0.015***	-0.020***	-0.014***		
		(-4.385)	(-4.755)	(-2.845)		
N	493,378	591,110	493,378	437,850	437,850	420,010
R^2	0.36	0.35	0.36	0.15	0.57	0.58
Time × Loan Type FEs	YES	YES	YES	YES	YES	YES
Borrower × Time FEs	NO	NO	NO	NO	YES	YES
Borrower × Loan Type FEs	YES	YES	YES	YES	YES	YES
Controls	NO	NO	NO	YES	YES	YES
NY Excluded	NO	NO	NO	NO	NO	YES

Table 4: **Liquidity loans and inflation by voting status.** Panel A (B) reports estimation results for Equation (3) using the sample of borrower-quarter observations of Reserve Bank regions that lack (have) voting rights in a specific quarter. Bank-level control variables include the natural logarithm of a bank's assets, the Tier 1 capital ratio, ROA, total deposits as a fraction of total liabilities, and commercial and industrial loans as a fraction of a bank's assets. All control variables are lagged as of the previous quarter. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Panel A. Voting district-quarters

Dependent variable: Liquidity Loan % Assets			
	(1)	(2)	(3)
DW × Local Inflation	0.035		0.037
	(0.671)		(0.706)
DW × Local UR		0.013	0.014
		(0.956)	(0.719)
N	177,780	212,802	177,780
R^2	0.67	0.58	0.67
Time × Loan Type FEs	YES	YES	YES
Borrower × Loan Type FEs	YES	YES	YES
Borrower × Time FEs	YES	YES	YES

Panel B. Non-voting district-quarters

Dependent variable: Liquidity Loan % Assets			
	(1)	(2)	(3)
DW × Local Inflation	-0.333***		-0.314***
	(-4.351)		(-4.300)
DW × Local UR		0.065***	0.068***
		(2.917)	(2.620)
N	294,812	357,542	294,812
R^2	0.58	0.58	0.58
Time × Loan Type FEs	YES	YES	YES
Borrower × Loan Type FEs	YES	YES	YES
Borrower × Time FEs	YES	YES	YES

Table 5: **Liquidity loans and inflation: full sample.** This table reports estimates of the empirical setting described in Section 4.2. "DW" is a dummy variable that identifies Discount Window loans and "No Vote" is a dummy variable that identifies quarters in which a regional Reserve Bank *lacks* voting rights. Table B.4 in the Appendix shows results if we include test loans in calculating total DW loans for a bank during a quarter. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.368***		-0.351***
	(-3.799)		(-3.706)
DW × No Vote × Local UR		0.052**	0.054**
		(2.361)	(1.994)
DW × Local Inflation	0.035		0.037
	(0.671)		(0.706)
DW × Local UR		0.013	0.014
		(0.956)	(0.719)
N	472,592	570,344	472,592
R^2	0.61	0.58	0.61
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table 6: **Liquidity loans and inflation: Access to DW and FHLB loans.** This table studies the robustness of our results to various borrower bank selection criteria. Across columns, we condition the sample on having used FHLB and DW credit during the sample period. In Column (1) we repeat the main result from Table 5's Column (4), where we use all banks in the U.S. Call Reports. In Column (2), we consider banks that have used either type of loan at least once during the sample period. In Column (3), we consider banks that have used both types of loans during the sample period. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)
Bank access criterion:	*Full (Table 5's Col(3))*	*Either*	*Both*
DW × No Vote × Local Inflation	-0.351***	-0.428***	-0.540***
	(-3.706)	(-3.730)	(-2.684)
DW × No Vote × Local UR	0.054**	0.062*	0.119**
	(1.994)	(1.916)	(2.211)
DW × Local Inflation	0.037	0.046	0.029
	(0.706)	(0.731)	(0.248)
DW × Local UR	0.014	0.015	0.009
	(0.719)	(0.640)	(0.188)
N	472,592	383,316	156,028
R^2	0.61	0.61	0.61
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table 7: **Table 5 using the second month's macro conditions.** This table complements Table 5 by using the second month's inflation and unemployment rates. Please see other table details in Table 5. Standard errors are clustered at the borrower level. *t*-statistics are reported in parentheses. ***, *p*-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets			
	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.228***		-0.220***
	(-2.660)		(-2.590)
DW × No Vote × Local UR		0.052**	0.057**
		(2.355)	(2.085)
DW × Local Inflation	0.010		0.013
	(0.203)		(0.264)
DW × Local UR		0.013	0.014
		(0.953)	(0.723)
N	472,592	570,344	472,592
R^2	0.61	0.58	0.61
Borrower × Time FEs	YES	YES	YES
Borrower × Loan Type FEs	YES	YES	YES
Time × Loan Type FEs	YES	YES	YES
FEs Interacted with Voting Dummy	YES	YES	YES

Table 8: **District robustness.** This tables repeats the main result from Table 5's Column (4), but drops one district at the time. For example, in Column (1) the first district (corresponding to Boston) is dropped. All districts are omitted in addition to the New York reserve bank, which is always omitted from our baseline specification. Therefore Column (1) drops both Boston (district 1) and New York (district 2). Column (2) simply omits New York and thus corresponds to Table 5's Column (4). Standard errors are clustered at the borrower level. *t*-statistics are reported in parentheses. ***, *p*-value <1%; **, <5%; *, <10%.

Panel A

Dependent variable: Liquidity Loan % Assets						
Omitted District:	Boston	New York	Philadelphia	Cleveland	Richmond	Atlanta
	(1)	(2)	(3)	(4)	(5)	(6)
DW × No Vote × Local Inflation	-0.298***	-0.351***	-0.312***	-0.406***	-0.353***	-0.380***
	(-3.373)	(-3.706)	(-3.294)	(-4.009)	(-3.374)	(-3.493)
DW × No Vote × Local UR	-0.001	0.054**	0.049*	0.053*	0.062**	0.067**
	(-0.047)	(1.994)	(1.717)	(1.890)	(2.125)	(2.068)
DW × Local Inflation	0.102*	0.037	-0.000	0.058	0.026	0.037
	(1.670)	(0.706)	(-0.005)	(1.020)	(0.455)	(0.644)
DW × Local UR	0.017	0.014	0.012	0.015	0.014	0.005
	(0.846)	(0.719)	(0.654)	(0.762)	(0.711)	(0.246)
N	449,130	472,592	453,898	442,506	441,538	402,260
R^2	0.61	0.61	0.61	0.61	0.61	0.62
Borrower × Time FEs	YES	YES	YES	YES	YES	YES
Borrower × Loan Type FEs	YES	YES	YES	YES	YES	YES
Time × Loan Type FEs	YES	YES	YES	YES	YES	YES
FEs Interacted with Voting Dummy	YES	YES	YES	YES	YES	YES

Panel B

Dependent variable: Liquidity Loan % Assets						
Omitted District:	Chicago	St. Louis	Minneapolis	Kansas City	Dallas	San Francisco
	(1)	(2)	(3)	(4)	(5)	(6)
DW × No Vote × Local Inflation	-0.383***	-0.312***	-0.296***	-0.380***	-0.336***	-0.382***
	(-3.923)	(-2.968)	(-3.000)	(-3.556)	(-3.675)	(-3.742)
DW × No Vote × Local UR	0.073**	0.048*	0.051*	0.047*	0.074***	0.081**
	(2.284)	(1.747)	(1.885)	(1.702)	(2.766)	(2.380)
DW × Local Inflation	0.077	0.015	-0.005	0.057	0.000	0.041
	(1.249)	(0.253)	(-0.093)	(1.000)	(0.001)	(0.720)
DW × Local UR	0.019	0.013	0.016	0.020	0.006	0.013
	(0.773)	(0.647)	(0.829)	(1.010)	(0.338)	(0.529)
N	374,412	412,100	452,948	442,640	420,036	434,452
R^2	0.61	0.61	0.58	0.61	0.61	0.61
Borrower × Time FEs	YES	YES	YES	YES	YES	YES
Borrower × Loan Type FEs	YES	YES	YES	YES	YES	YES
Time × Loan Type FEs	YES	YES	YES	YES	YES	YES
FEs Interacted with Voting Dummy	YES	YES	YES	YES	YES	YES

Table 9: **Liquidity loans and inflation: Subsamples based on the time series of the difference in local economic conditions among Reserve Banks.** This table repeats the analysis in Column (4) of Table 5 based on sample splits derived from the difference in inflation and unemployment rate among Reserve Banks. For the inflation wedge, we follow Fos and Xu (2025) and calculate the max-min spread of local inflation rates across all districts scaled by the level of U.S. overall inflation in the past 3 years. We then use the median value to obtain high and low dispersion period subsamples. We use a similar procedure to derive the unemployment rate wedge. Columns (1)-(4) display regression results accordingly. Standard errors are clustered at the borrower level. *t*-statistics are reported in parentheses. ***, *p*-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)	(4)
Sample split criterion:	High Wedge (Infl.)	Low Wedge (Infl.)	High wedge (UR)	Low wedge (UR)
DW × No Vote × Local Inflation	-0.585***	0.136	-0.649***	0.101
	(-4.599)	(0.967)	(-4.701)	(0.956)
DW × No Vote × Local UR	0.042	0.026	0.039	0.101
	(1.053)	(0.729)	(0.927)	(1.290)
DW × Local Inflation	0.102	-0.106	0.147*	-0.040
	(1.479)	(-1.173)	(1.664)	(-0.668)
DW × Local UR	0.062**	-0.027	0.053	-0.041
	(2.074)	(-1.339)	(1.364)	(-0.744)
N	235,552	234,062	246,216	224,444
R^2	0.64	0.61	0.65	0.60
Borrower × Time × Voting Status FEs	YES	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES	YES

Table 10: **Subsamples based on periods of plausible financial distress and heightened reliance on DW credit.** This table repeats the analysis in Column (4) of Table 5 but splits the sample into two periods. The stress period of our sample (2020-2022) represents a time of economic distress and heightened reliance on the DW system compared to the non-stress period (2010-2019). Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets		
Sample split criterion:	Stress (1)	No-Stress (2)
DW × No Vote × Local Inflation	-0.619***	-0.051
	(-3.420)	(-0.644)
DW × No Vote × Local UR	0.105	-0.008
	(1.430)	(-0.344)
DW × Local Inflation	0.094	-0.040
	(1.034)	(-0.756)
DW × Local UR	-0.001	-0.023
	(-0.012)	(-1.151)
N	125,368	346,968
R^2	0.69	0.62
Borrower × Time × Voting Status FEs	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES

Table 11: **Economic implications: Bank loan issuance to businesses and consumers.** This table reports estimates of the empirical specification described in Section 5, Equation (4). The analysis is at a borrower bank-quarter level. The dependent variable is the change in loan balances as a percent of last quarter-end assets. We stack two types of loans issued by borrower banks: Type (1) loans that are not supported by FHLB loans and are basically issued to firms (e.g., commercial and industrial loans (C&I) + non-residential real estate (NRRE) loans), and Type (2) residential real estate (RRE) loans (e.g., mortgagees). "FIRM" is a dummy variable that equals one if the loan is Type (1) and zero otherwise. Standard errors are clustered at the borrower bank level. *t*-statistics are reported in parentheses. ***, *p*-value <1%; **, <5%; *, <10%.

Dependent variable: Bank Loan Issuance This Quarter % Assets			
	(1)	(2)	(3)
No Vote × FIRM × Local Inflation	-0.210**		-0.167*
	(-2.110)		(-1.721)
No Vote × FIRM × Local UR		0.151***	0.207***
		(3.961)	(4.575)
FIRM × Local Inflation	-0.090		-0.103*
	(-1.519)		(-1.736)
FIRM × Local UR		-0.050**	-0.094***
		(-2.392)	(-3.666)
N	464,814	562,202	464,814
R^2	0.73	0.77	0.73
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Appendices for “Local Monetary Policy”

A Data Appendix

This appendix section complements and provides more details on the material covered in Section 2.

A.1 More Details on the Discount Window

The main lending facility is the primary credit facility. To receive a primary loan, a borrower must be in sound financial shape (CAMELS ratings of 1, 2, or 3). Financial borrowers with weaker balance sheets can access funding at a penalty rate using the secondary credit facility (typically 50 basis points over the primary rate). Seasonal credit is the cheapest among the three, and this credit facility is mostly used by small banks who are unable to access more common sources of funding and face recurring liquidity shocks; a typical case would be a small bank in a farming community that has highly seasonal asset and liability flows.

Under the new primary and secondary credit programs approved by the Federal Reserve Board on October 31, 2002 (effective starting 2003), all three rates are set homogeneously across the United States and constitute an upper bound on the Federal Funds Rate. In fact, initially the primary credit rate was explicitly pegged at 100 basis points above the FOMC target rate. The press release on January 6, 2003 (when the new regulation was first implemented) can be found at https://www.federalreserve.gov/boarddocs/press/monetary/2003/20030106/default.htm. The Press Release on October 31, 2002 can be found at https://www.federalreserve.gov/boarddocs/press/bcreg/2002/200210312/default.htm. The main takeaway is as follows:

> The rule replaces adjustment credit, which currently is extended at a below-market rate, with a new type of discount window credit called primary credit that will be broadly similar to credit programs offered by many other major central banks. Primary credit will be available for very short terms as a backup source of liquidity to depository institutions that are in generally sound financial condition in the judgment of the lending Federal Reserve Bank. The Board expects that most depository institutions will qualify for primary credit.
>
> Reserve Banks will extend primary credit at a rate above the federal funds rate, which should eliminate the incentive for institutions to borrow for the purpose of exploiting the positive spread of money market rates over the discount rate. The Board anticipates that the primary credit rate will be set initially at 100 basis points above the FOMC's target federal funds rate.

The 10/31/2002 press release explains that the reason for this regulatory change is to eliminate the stigma and encourage DW usage:

> By employing an above-market rate and restricting eligibility to generally sound institutions, the primary credit program should considerably reduce the need for the Federal Reserve to review the funding situations of borrowers and monitor the use of borrowed funds. This reduced administration in turn should make the discount window a more attractive funding source for depository institutions when money markets tighten.

The secondary credit rate is pegged against the primary credit rate:

> The Board's final rule also establishes a secondary credit program that will be available in appropriate circumstances to depository institutions that do not qualify for primary credit. The Board anticipates that Reserve Banks will initially establish a secondary credit rate at a level 50 basis points above the primary credit rate.

This regulatory change should not change how the FOMC makes decisions about the target rate set for the national open market operations:

> The rule does not entail a change in the stance of monetary policy. The Federal Open Market Committee's target for the federal funds rate will not change as a result of the adoption of these programs, and the level of market interest rates more generally will be unaffected.

In terms of borrower profiles at the DW, commercial banks are the most frequent and most important borrowers, as documented in Ennis (2021). However, there are other financial borrowers that can access the DW, such as credit unions, thrift borrowers, and foreign banking organizations.

A.2 More Details on Other Liquidity Loans

The Federal Home Loan Bank (FHLB) System was established by the Federal Home Loan Bank Act of 1932 as a government-sponsored enterprise (GSE) to support mortgage lending and community investment. It was created in response to the Great Depression to provide liquidity to savings and loan institutions. One of its main missions is to support the liquidity of the national mortgage market.

The FHLB system is structured as 11 FHLB district banks, cooperatively owned by their member financial institutions, which include commercial banks, savings and loan associations, credit unions, and insurance companies. There used to be 12 FHLB districts, roughly mirroring the geographical organization of the Federal Reserve system. However, in 2014, the FHLB of Seattle agreed to be acquired by the much larger FHLB of Des Moines, resulting in the current 11 FHLB banks. Figures A.1 and A.2 show the current map of FHLB and Federal Reserve districts.[A.2]

[A.2] Our district fixed effects always refer to the borrower's corresponding DW district.

The main role of FHLB banks is to provide liquidity to its member institutions in the form of advances; "demand for these advances often mirrors broader economic conditions and can experience sudden shifts."[A.3] By law, FHLB advances are responsive to the liquidity needs of member institutions.https://www.congress.gov/crs-product/R46499; https://www.cbo.gov/system/files/2024-03/59712-FHLB.pdf These advances can range from overnight loans to long term credit maturing over multiple years.[A.4] They can carry both variable and fixed interest rate schemes. As of 2023, the FHLB system held over $800 billion in outstanding advances, 56.3% of all advances were fixed rate advances, and over 50% had a remaining maturity of less than one year. FHLB advances are financed through the issuance of debt securities to outside investors through the FHLB Office of Finance. Figure A.3 is taken from the 2023 FHLB annual report and outlines the flow of funds inside the FHLB system. Each FHLB bank also raises funds in the form of deposits from its member financial institutions, and the issuance of capital stock.

Each of the 11 regional FHLBs is a separate entity with its own management, balance sheet, and member institutions; all FHLBs are jointly and severally liable for consolidated debt issued through the Federal Home Loan Banks' Office of Finance under Congress. There is limited academic research on the impact and functioning of the FHLB system; Ashcraft, Bech, and Frame (2010) provide a very detailed discussion. Alternatively, one can consult the FHLB annual reports available at https://www.fhlb-of.com/ofweb_userWeb/pageBuilder/fhlbank-financial-data-36.

[A.3] https://www.fhfaoig.gov/sites/default/files/WPR-2023-002.pdf

[A.4] Our analysis focuses exclusively on short-term FHLB credit to ensure consistency with DW loans.

Table A.1: Summary of variables.

Label	Source	Variable Description
DW Loan % Assets	FRB	Total amount of DW loans greater than $100,000 extended to a single borrower bank in a given quarter, expressed as a percentage of the borrower's last quarter's assets.
Chg FHLB % Assets	Call Report	Quarterly change in FHLB loan balances expressed as a percentage of the previous quarter's assets. (Includes only FHLB advances maturing in less than one year).
Security REPOs % Assets	Call Report	The amount of securities sold with an agreement to be repurchased that are outstanding at the end of the quarter, scaled by the bank's assets.
Local Inflation	BLS & Author's calculation	Weighted average inflation calculated using inflation in the first and second months of each quarter.
Local UR	BLS & Author's calculation	Weighted average unemployment rates (UR) calculated using UR in the first and second months of each quarter.
No Vote	Fos and Xu (2025)	Dummy variable indicating the lack of an FOMC voting right for a district in a given quarter.
DW	-	Dummy variable that identifies a Discount Window loan.
Chg C&I+NRRE % Assets (Type (1))	Call Report	Changes in commercial, industrial, and non-residential real estate loans outstanding on a bank's balance sheet expressed as a percent of total assets.
Chg RRE % Assets (Type (2))	Call Report	Changes in residential real estate loans outstanding on a bank's balance sheet expressed as a percent of total assets.
FIRM, or $I_{l=Type(1)}$	-	Dummy variable that identifies a Discount Window loan.
Ln(Assets)	Call Report	The natural logarithm of the assets held on a borrower bank's balance sheet.
Tier 1	Call Report	Basel III Tier 1 capital ratio expressed as a percentage of risk-weighted assets.
ROA	Call Report	Return on assets expressed as the percentage of net income over assets.
Deposits % Liabilities	Call Report	Total deposits (includes time deposits, savings deposits, etc.) expressed as a percent of total liabilities.
C&I Loans % Assets	Call Report	Commercial and industrial loans outstanding on a bank's balance sheet expressed as a percent of total assets.

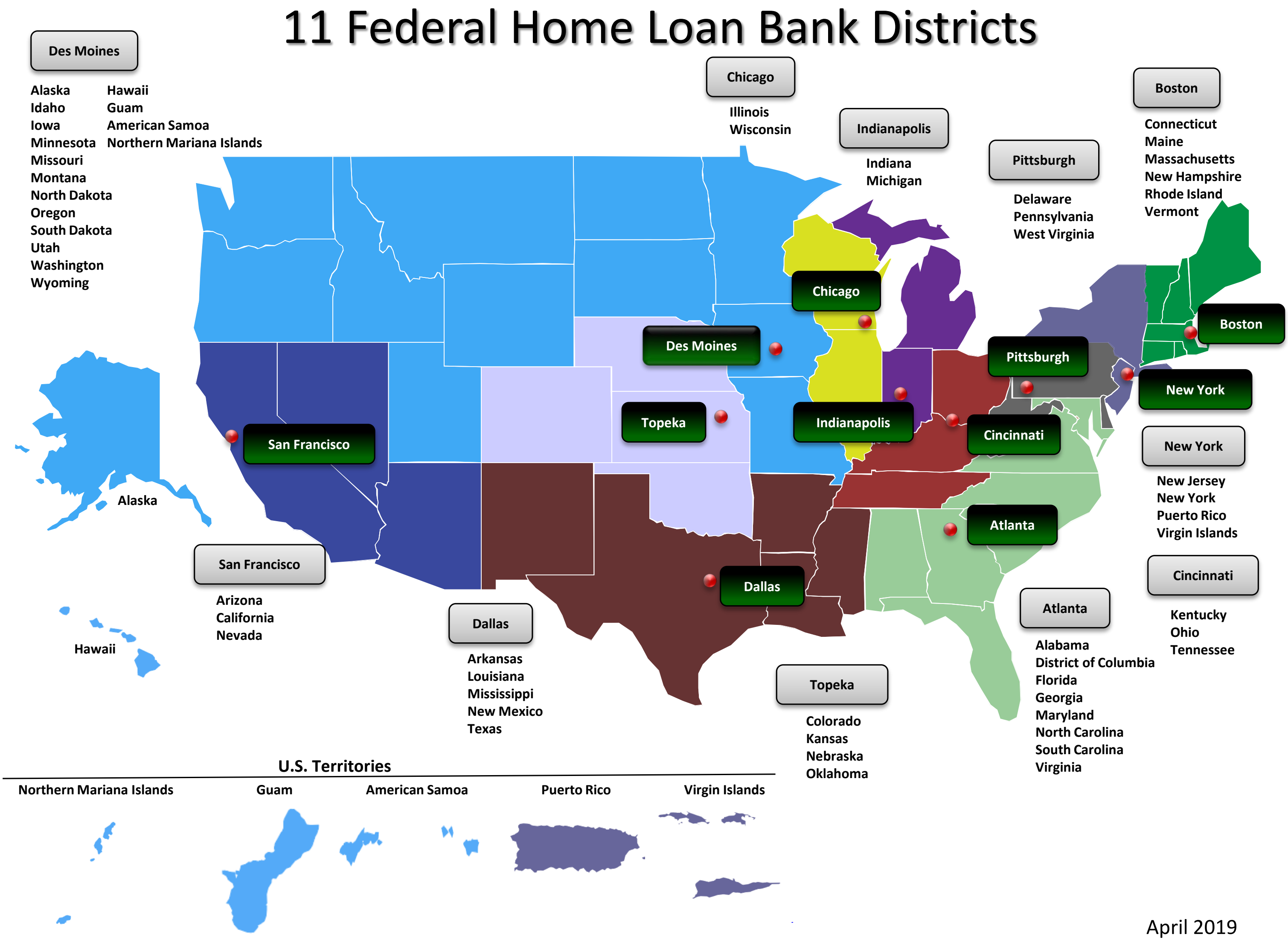


Figure A.1: Map of the 11 FHLB districts. https://www.fhfa.gov/SupervisionRegulation/FederalHomeLoanBanks/Pages/About-FHL-Banks.aspx

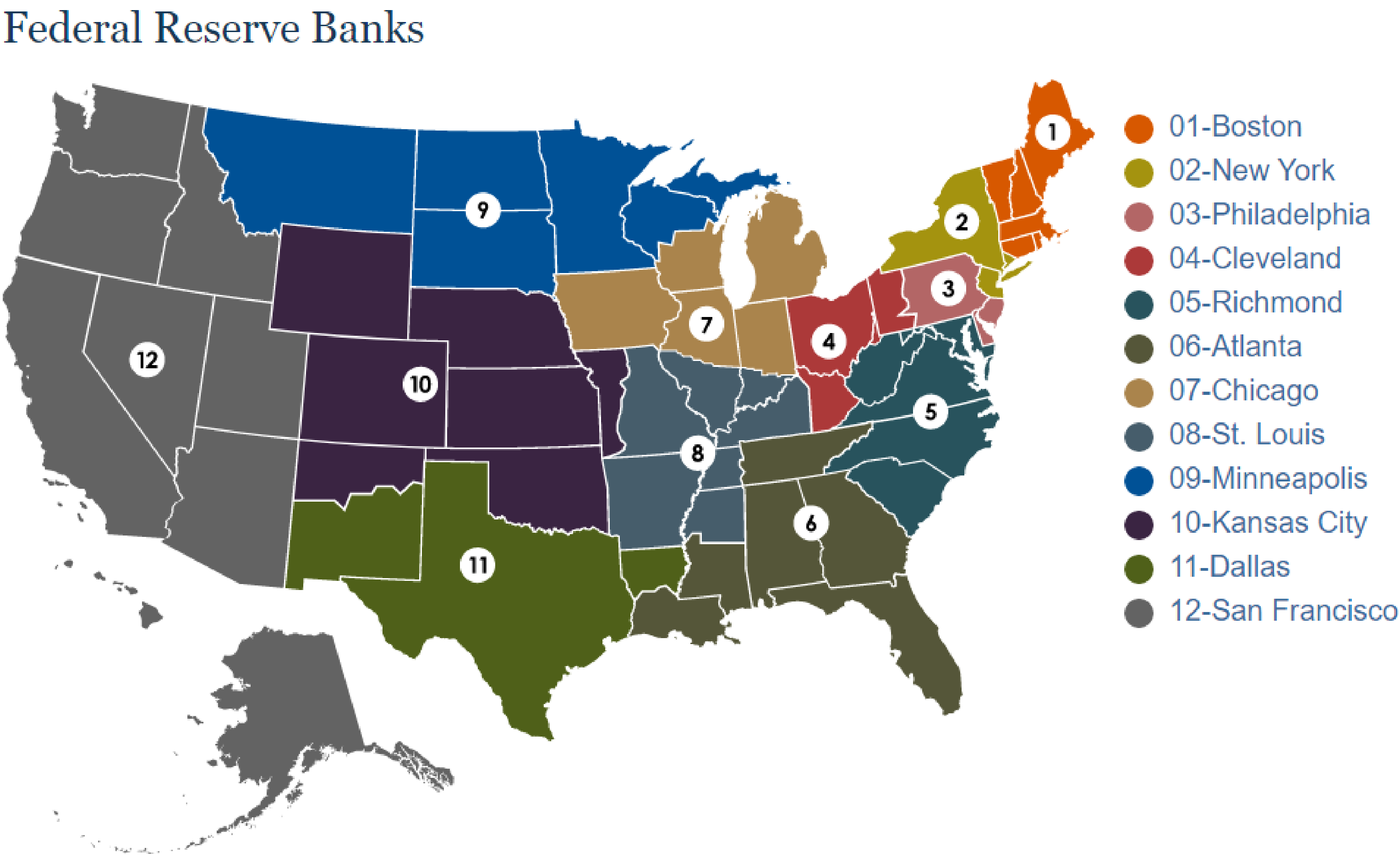


Figure A.2: Map of the 12 Federal Reserve districts. https://www.federalreserve.gov/aboutthefed/federal-reserve-system.htm

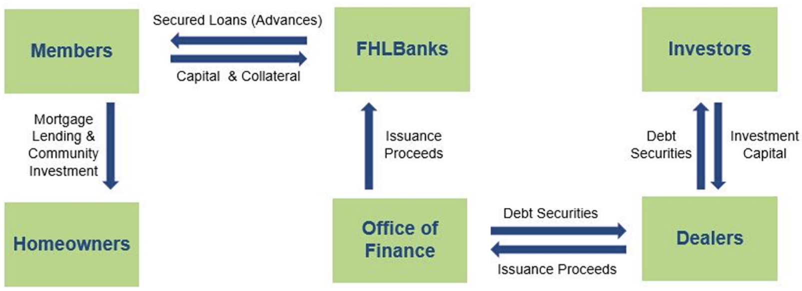


Figure A.3: Flow of Funds within the FHLB System. https://www.fhlb-of.com/ofweb_userWeb/pageBuilder/fhlbank-financial-data-36

B Additional Results

Table B.1: **Summary statistics for the bank control variables.** This table reports summary statistics for the datasets used in this paper. The sample covers all banks that filed Call Reports between 2010-2022. Panel A(1) reports summary statistics for the full sample. Panels A(2) and A(3) split the sample between non-voting and voting district quarters, respectively. $Ln(Assets)$ is the natural logarithm of the assets held on a borrower bank's balance sheet. $Tier1$ is Basel III Tier 1 capital ratio expressed as a percentage of risk-weighted assets. ROA is return on assets expressed as the percentage of net income over assets. *Deposits % Liabilities* is total deposits (time deposits, savings deposits, etc.) expressed as a percent of total liabilities. *C&I Loans % Assets* is commercial and industrial loans outstanding on a bank's balance sheet expressed as a percent of total assets.

	COUNT (1)	MEAN (2)	SD (3)	P1 (4)	P5 (5)	P25 (6)	P50 (7)	P75 (8)	P95 (9)	P99 (10)
Panel A(1). Borrower-Quarter level; All district-quarters										
ln(Assets)	295668	12.353	1.445	9.559	10.388	11.437	12.191	13.062	14.882	17.139
Tier 1	275937	55.046	5374.926	6.820	10.270	12.576	15.176	19.779	39.545	426.632
ROA	295668	0.619	7.397	-1.928	-0.182	0.225	0.474	0.841	1.584	3.371
Deposits % Liabilities	295640	93.682	11.792	5.542	81.016	92.139	96.955	99.294	99.842	99.939
C&I Loans % Assets	291670	8.145	6.970	0	0.093	3.583	6.626	10.828	20.966	33.371
Panel A(2). Borrower-Quarter level; District-quarters without voting rights (60.5%)										
ln(Assets)	178848	12.325	1.418	9.563	10.387	11.424	12.171	13.028	14.773	17.008
Tier 1	166318	61.239	6903.479	6.500	10.227	12.569	15.132	19.660	38.260	373.710
ROA	178848	0.620	3.234	-2.119	-0.213	0.224	0.475	0.844	1.593	3.343
Deposits % Liabilities	178838	93.837	11.542	12.460	81.417	92.290	97.055	99.319	99.845	99.940
C&I Loans % Assets	176806	8.227	6.945	0	0.221	3.697	6.701	10.901	20.958	33.447
Panel A(3). Borrower-Quarter; District-quarters with voting rights (39.5%)										
ln(Assets)	116820	12.398	1.485	9.547	10.389	11.456	12.224	13.117	15.074	17.327
Tier 1	109619	45.649	643.476	7.270	10.324	12.587	15.242	19.970	41.590	469.643
ROA	116820	0.617	11.067	-1.653	-0.138	0.226	0.471	0.836	1.570	3.430
Deposits % Liabilities	116802	93.445	12.160	0.231	80.398	91.894	96.794	99.251	99.837	99.938
C&I Loans % Assets	114864	8.018	7.007	0	0.006	3.406	6.496	10.711	20.989	33.304

Table B.2: **Table 5 using quarterly inflation and unemployment rates.** Instead of using the macro variables prior to the third month of a quarter (when most DW loans are issued according to Figure 1) as part of our empirical strategy, this table uses quarterly macro variables. Please see other table details in Table 5 of the main manuscript. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets			
	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.005		0.007
	(-0.138)		(0.195)
DW × No Vote × Local UR		0.051*	0.060*
		(1.855)	(1.936)
DW × Local Inflation	-0.057**		-0.055**
	(-2.171)		(-2.123)
DW × Local UR		0.016	0.013
		(0.751)	(0.553)
N	472,592	570,344	472,592
R^2	0.61	0.58	0.61
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table B.3: **Table 5 using REPO as the demand proxy.** This table complements Table 5 by using REPO instead of FHLB loans as the demand proxy. Please see other table details in Table 5 of the main manuscript. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets			
	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.387***		-0.374***
	(-3.396)		(-3.382)
DW × No Vote × Local UR		0.063**	0.032
		(2.012)	(0.810)
DW × Local Inflation	0.094		0.097
	(1.259)		(1.322)
DW × Local UR		-0.003	0.023
		(-0.126)	(0.683)
N	472,592	570,344	472,592
R^2	0.68	0.68	0.68
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table B.4: **Table 5 including test loans.** This table complements Table 5 by including test loans (DW Loans <= \$100,000) in calculating total DW loans for a bank during a given quarter. Please see other table details in Table 5 of the main manuscript. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.369***		-0.352***
	(-3.802)		(-3.709)
DW × No Vote × Local UR		0.052**	0.054**
		(2.360)	(1.993)
DW × Local Inflation	0.035		0.037
	(0.675)		(0.710)
DW × Local UR		0.013	0.014
		(0.951)	(0.719)
N	472,592	570,344	472,592
R^2	0.61	0.58	0.61
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table B.5: **Table 5 excluding seasonal DW loans.** This table complements Table 5 by examining only primary and secondary DW credit. Please see other table details in Table 5 of the main manuscript. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)
DW × No Vote × Local Inflation	-0.324***		-0.306***
	(-3.643)		(-3.593)
DW × No Vote × Local UR		0.054***	0.058**
		(2.632)	(2.456)
DW × Local Inflation	0.045		0.046
	(0.971)		(0.992)
DW × Local UR		0.007	0.008
		(0.665)	(0.596)
N	472,592	570,344	472,592
R^2	0.60	0.55	0.60
Borrower × Time × Voting Status FEs	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES

Table B.6: **Robustness to Table 9 using unscaled inflation and unemployment wedges.** This table complements the high and low inflation split by max-min local inflation and unemployment rate (unscaled by the national U.S. 3-year rolling average). Please see other table details in Table 9 of the main manuscript. Standard errors are clustered at the borrower level. t-statistics are reported in parentheses. ***, p-value <1%; **, <5%; *, <10%.

Dependent variable: Liquidity Loan % Assets	(1)	(2)	(3)	(4)
Sample split criterion:	High Wedge (Infl.)	Low Wedge (Infl.)	High wedge (UR)	Low wedge (UR)
DW × No Vote × Local Inflation	-0.377***	-0.181	-0.570***	-0.005
	(-3.500)	(-1.213)	(-4.279)	(-0.047)
DW × No Vote × Local UR	0.098***	-0.025	0.046	0.034
	(2.684)	(-0.840)	(1.018)	(0.489)
DW × Local Inflation	0.024	0.061	0.072	-0.005
	(0.431)	(0.591)	(0.910)	(-0.084)
DW × Local UR	0.007	0.019	0.051	-0.023
	(0.304)	(0.750)	(1.175)	(-0.421)
N	243,344	227,580	246,992	224,294
R^2	0.63	0.62	0.66	0.59
Borrower × Time × Voting Status FEs	YES	YES	YES	YES
Borrower × Loan Type × Voting Status FEs	YES	YES	YES	YES
Time × Loan Type × Voting Status FEs	YES	YES	YES	YES

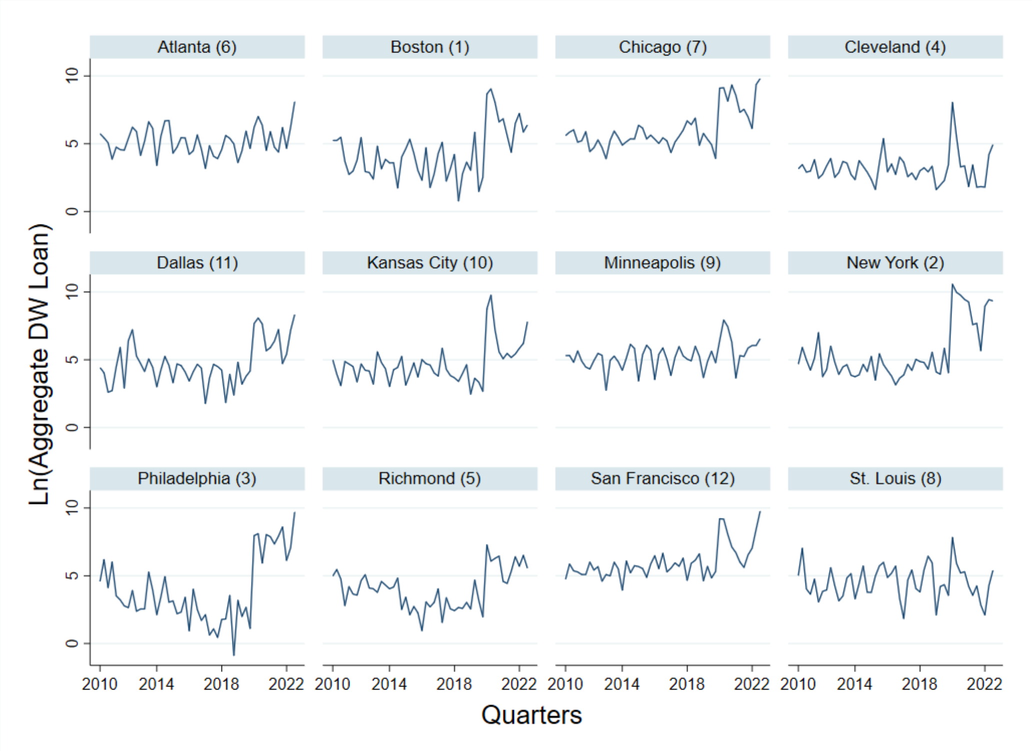


Figure B.1: **DW activities by Federal Reserve district.** This figure summarizes all Discount Window loans (at a quarterly frequency) and plots the natural logarithm of the total dollar amount for each Reserve Bank district and year-quarter from Q3/2010 to Q3/2022. The national series is presented in Figure 3.

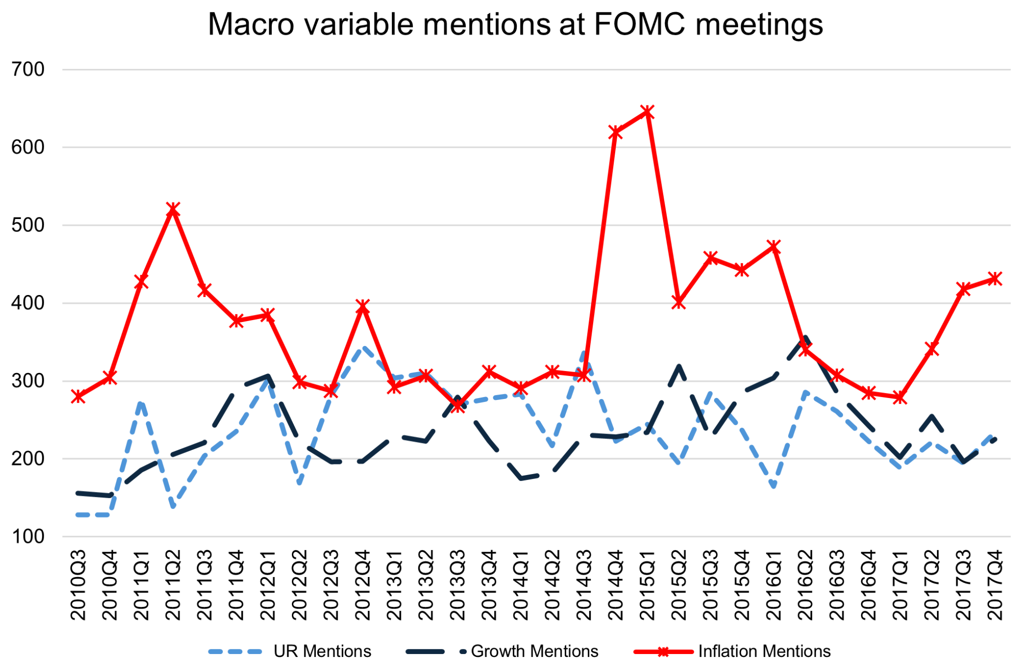


Figure B.2: **Mentions of macro variables at FOMC meetings.** This figure complements Figure 5 and shows relative mentions of macro variables using FOMC transcripts. Growth-related keywords include {growth, gdp, production, manufactory, productivity, income, development, infrastructure, construction} and their obvious variants.