Policy Uncertainty and Bank Mortgage Credit*

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ABSTRACT

We document that banks reduce supply of jumbo mortgage loans when policy uncertainty increases as measured by the timing of US gubernatorial elections in banks' headquarter states. The reduction is larger for term-limited elections and close elections. We utilize high-frequency, geographically granular loan-level data to address an identification problem arising from changing demand for loans: (1) the data allows for a difference-in-difference specification with state/time fixed effects; (2) the results hold at the county level; (3) banks reduce lending not just in their home states but also outside their home states when their home states hold elections; (4) we observe important cross-sectional differences in the way banks with different characteristics respond to policy uncertainty. Overall, the findings suggest that policy uncertainty has a real effect on residential housing markets through banks' credit supply decisions and that it can spill over across states through lending by banks serving multiple states.

Keywords: Bank Mortgage Credit, Housing Market, Policy Uncertainty, Gubernatorial Elections

JEL Codes: G21, G28

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1. Introduction

The uncertainties associated with possible changes in government leadership or policy can affect the behavior of firms through various channels, such as industry regulation, monetary and trade policy, and taxation. Indeed, growing literature documents that nonfinancial firms cut back investment expenditures when they face policy uncertainty around elections (e.g., Julio and Yook (2012) and Jens (2017)). These studies are guided by models of investment under uncertainty (e.g., Bernanke (1983) and Bloom, Bond, and Van Reenen (2007)), where firms become cautious and hold back on investment in the face of uncertainty if the investment is at least partially irreversible. However, it is an open question how policy uncertainty would affect banks' lending behavior. In particular, many bank loans are at least partially irreversible, raising the question of whether banks would reduce the supply of credit in the face of policy uncertainty. This is also an important question because financial institutions, which operate in a heavily regulated industry, likely face more uncertainty than nonfinancial firms when the political landscape changes, and their response to such changes may have a riffle effect in the economy because of their role as intermediaries. The recent financial crisis illustrates well implications of changes in banks' credit supply for financial stability.[1]

This paper investigates how policy uncertainty affects banks' investment decisions in mortgage markets, that is, their supply of mortgage credit. This is a challenging task for two reasons. First, uncertainties affect all economic agents including households, who are also likely to cut back on housing investment when facing higher uncertainty. Thus, any observable change in bank lending is an equilibrium outcome reflecting both credit supply from banks and demand from borrowers. Second, a relationship between uncertainty and banks' investment decision can be endogenous as the economic downturn itself can generate a great deal of political uncertainty. Thus, establishing a causal relationship requires an exogenous measure of political uncertainty.

We address the first challenge by taking advantage of rich supervisory data on bank mortgage credit–confidential Home Mortgage Disclosure Act (HMDA) data. HMDA data, shown

[1] See, for example, Mian and Sufi (2009), Adelino, Schoar and Severino (2014), and Favilukis, Ludvigson, and Van Nieuwerburgh (2017).

at the loan-level, have important advantages over bank-level data in evaluating cross-sectional variations in banks' lending behavior. In addition, the confidential version of HMDA data provides exact loan transaction dates, allowing us to evaluate the data at a higher frequency. The public version only shows the information at an annual frequency. We aggregate the daily data to merge with banks' quarterly financial information. A quarterly frequency allows us to control for changing demand dynamics better than an annual frequency. It also captures possible short-term effects of uncertainty on banks' behavior that may be averaged out in annual data.

The availability of loan-level information also helps address the identification challenge by allowing to map each loan to a state and a county where the loan was extended. That is, we are able to conduct a geographically granular examination by evaluating banks' lending decisions at the state level and county level. A bank's lending aggregated at the national level does not reveal cross-sectional variations within a bank serving multiple states. We employ a difference-in-difference methodology to exploit time-series variations within a bank as well as cross-sectional variations across banks. Specifically, we are able to compare a bank's lending behavior in election quarters and non-election quarters, and compare, at a given point in time, banks facing elections in their home states and those that are not because banks headquartered in different states face gubernatorial elections in different years. The granular information on the lending location also allows to control for each state's time-varying demand for mortgage credit and other local economic conditions affecting banks' lending decisions.

To address the second challenge, we employ a plausibly exogenous measure of policy uncertainty: the timing of U.S. gubernatorial elections. A state's gubernatorial election increases policy uncertainty for banks headquartered in the state because a possible change in state government leadership can lead to changes in various state policies, including state taxes, subsidies, budget, and procurement (Peltzman (1987), Besley and Case (1995), Colak, Durnev, and Qian (2017)). A state's governor also has a strong influence over the appointment of the head of the state banking regulators, who in turn hold various regulatory powers such as chartering, rulemaking, supervision, and enforcement (Saiz and Semenov (2014), Labonte (2017)). Furthermore, banks usually have a strong presence in their headquarter states in terms of the number of employees and branches as well as deposit taking and lending, making them highly

interconnected with their home states' economy. In fact, banks sometimes express strong attachment to their home states in their annual reports and are tuned into economic and political developments in their home states. Empirically, the measure has important advantages. These election dates are predetermined by law and are independent of the states' economic conditions. Furthermore, different states hold gubernatorial elections in different years, allowing us to net out national business cycle effects. In fact, several previous studies have used election timing as a quasi-natural experimental setting to identify the link between policy uncertainty and various economic outcomes.[2]

For our analysis, we aggregate the daily loan-level HMDA data between 1990 and 2014 at the bank, state, and quarter level and merge with banks' quarterly financial information and data on 323 gubernatorial elections across 48 U.S. states.[3] In our baseline regressions, we focus on the type of loans that we consider relatively more irreversible—jumbo loans held in banks' balance sheets—as models of investment under uncertainty suggest that irreversibility increases the information value of waiting to invest, causing investment to vary negatively with fluctuations in policy uncertainty over time. In later sections, we also consider a broader universe of loans including non-jumbo loans and loans originated regardless of whether they were held in banks' balance sheets or disposed.[4] While the various types of loans considered in this paper are all partially irreversible, the methodology section discusses why some types of loans are viewed as more irreversible investment.

Initial, descriptive evidence supports our prediction: Figure 1 shows that unconditional mean jumbo mortgage volume is lower when banks face elections in their home states and that the gap between election and non-election years widens as we move closer to the election quarter. We then control for various bank characteristics and fixed effects. The estimation results show that banks cut the volume of jumbo loans they either originate and hold or purchase and hold each quarter by approximately 13% to 25% compared when non-election quarters.

[2]Examples of international studies using the timing of national elections are Julio and Yook (2012) and Julio and Yook (2016). U.S. studies using U.S. gubernatorial elections include Gao and Qi (2013), Colak et al. (2017), Jens (2017), and Atanassov, Julio, and Leng (2016).

[3]We exclude New Hampshire and Vermont, which hold elections every other year as opposed to every four years.

[4]Banks often dispose loans soon after they are originated by either selling to the government-sponsored enterprises or by pooling as collateral for private label mortgage-backed securities.

The number of jumbo loans also declines by 4% to 6%. Figure 2 depicts the estimated jumbo mortgage credit cycle around elections. These estimates reflect changes in lending behavior in both banks' home states and foreign states in which they provide mortgage lending. The result has two important implications. First, policy uncertainty matters for banks' mortgage lending decisions. That is, policy uncertainty has a real effect on residential housing markets through banks' supply of mortgage credit. Second, policy uncertainty in one state has a spillover effect to other states through lending by financial institutions serving multiple states.

Our finding is not likely driven by time-varying demand for loans in banks' home states. First, our difference-in-difference methodology and state-time fixed effects helps control for the effect of changing demand. Second, we observe that state-level economic conditions are similar across election and non-election years. We also take a geographically more granular look at the data by examining mortgage lending at the county level, and find that the results are similar. These results suggest that our findings are not driven by changing demand for credit in response to state- or county-level economic conditions in election years. Third, we exploit the fact that many banks in our sample lend outside their home states as well. If the decline in lending in election quarters is solely driven by changes in demand in banks' home state, banks are unlikely to reduce lending in foreign states. We find that banks also reduce lending in their foreign states, not just in their home states, when their home states hold elections.

Fourth, we exploit cross-sectional differences across banks and examine whether banks with varying characteristics respond to political uncertainty differently. Our premise is that the change in lending behavior will vary with banks' characteristics if it was driven by supply rather than demand for loans. In particular, we consider two bank characteristics. First, we compare state-chartered banks and nationally chartered banks serving the same state, and find that state-chartered banks reduce jumbo mortgage lending more, implying that potential changes to state bank regulations following elections create an additional layer of uncertainty for state banks compared with national banks. The second characteristics we consider is banks' risk-taking behavior. We construct three risk indicators based on three measures of risk-taking, respectively: z-score, equity ratio, and credit risk. We find that more risky banks reduce the supply of jumbo mortgage credit a bit more than less risky banks, possibly because more risky banks are more vulnerable to changes in policy regimes.

We then exploit election characteristics to further examine whether the result is indeed driven by the uncertainty generated by elections. If the reduction in lending was driven by electoral uncertainty, the effect will likely be larger when there is a higher degree of uncertainty over the election outcome and, hence, over future policy. We find that mortgage lending cycles around elections are more pronounced in close races in which the outcome is highly uncertain. The decline in bank lending is also more severe in elections in which incumbent governors do not seek re-election due to binding term limits. Elections lacking incumbent candidates are likely more competitive and the uncertainty about election outcome is likely higher. These results suggest that jumbo mortgage credit supply declines more when uncertainty about the election outcome is higher.

Our results are robust to various checks such as using pseudo-election dates and different subsamples. We also consider an alternative measure of jumbo mortgage credit–the volume and number of jumbo mortgage loans banks originate regardless of whether they hold or sell the loans. We find that jumbo mortgage credit originations also fluctuate around elections, though at a smaller magnitude. To the extent that origination variables capture relatively more reversible investment, smaller reduction in investment supports the view that the investment-uncertainty relation is likely more negative for more irreversible assets. Finally, we explore an alternative sample of loans, conforming loans, and find a similar pattern although the decline in the quarterly volume is smaller than that in the jumbo loan market. We note that, while (partially) irreversible nature of loan investment explains our results well, reduction in lending is also generally consistent with the view that uncertainty can depress investment by raising risk premiums (Pástor and Veronesi (2013)).

Our work contributes to understanding how policy uncertainty affects housing markets through its effect on financial institutions.[5] Canes-Wrone and Park (2014) document that home prices and home sales decline in the year leading up to gubernatorial elections. However, their finding is an equilibrium outcome, reflecting both mortgage credit supply and demand effects. While isolating supply and demand effects is generally a challenging task, we make an important first step in separating the policy uncertainty effect coming from the supply side by exploiting the fact that the timing of gubernatorial elections is exogenous and staggered

[5]See Davis (2019) for detailed review of the literature on nonfinancial firms and policy uncertainty.

across states and the fact that many banks in our sample provide mortgage credit in both their home states and foreign states.

Our work is also related to the studies linking policy uncertainty and financial institutions' credit supply. Most related to our study is Gissler, Oldfather, and Ruffino (2016), which show a negative correlation between banks' perceived uncertainty and a specific mortgage-related regulation. Using bank-level data, Bordo, Duca, and Koch (2016) document that credit growth is negatively related to Baker, Bloom, and Davis (2016)'s economic policy uncertainty (EPU) index. Berger, Guedhami, Kim, and Li (2018) also use bank-level data to document that banks hoard more liquidity as EPU increases. Using loan-level data from Italian credit registry, Alessandri and Bottero (2017) document a reduction in banks' approval rates of commercial and industrial loans and an increase in the duration of an approval process when EPU is high. The EPU index, which captures the frequency of news articles indicating uncertainty about economic policy, is very useful in gauging a country's changing policy uncertainty over time. However, as noted by Baker, Bloom, and Davis (2016), identifying a causal relation between the EPU index and economic activities is challenging because policy responds to economic conditions and is likely to be forward looking. Also, because it is measured at the country level, it is not straightforward to disentangle the uncertainty effect from the national business cycle effect. In syndicated loan markets, Kim (2017) utilizes national elections around the world to establish a causal inference between policy uncertainty lenders face and firms' borrowing cost.

Finally, our finding about the cross-state spillover of policy uncertainty adds to the literature on the role that multi-market banks play in the cross-market spillover of economic shocks. Peek and Rosengren (1997, 2000) show that Japanese banks transmitted shocks that originated from Japan in 1990s to the U.S. by cutting back the commercial real estate lending in their U.S. branches. Berrospide, Black, and Keaton (2016) examine banks that operated in multiple U.S. metropolitan areas during the housing market collapse of 2007-09 and document that the banks, in response to high overall mortgage delinquencies in some markets that they were serving, reduced mortgage lending in other markets. Schnabl (2012) also documents a spillover of the effect of Russian debt default to foreign banks' lending in Peru. Cetorelli and Goldberg (2011), De Haas and Van Horen (2012), and Giannetti and Laeven (2012) study

the spillover effect in the case of cross-border lending by banks exposed to shocks during the financial crisis of 2007–09.

2. Data

We obtain daily mortgage loan information between 1990 and 2014 from the confidential Home Mortgage Disclosure Act (HMDA) data. The HMDA of 1975 is a law requiring most banks, savings and loan associations, credit unions, and consumer finance companies to report every mortgage application received. As a result, the data provide a substantial coverage of the United States mortgage market. Avery, Brevoort, and Canner (2007) estimate that HMDA covers approximately 80% of all home loans nationwide in 2006.[6] The mandatory reporting threshold for depository institutions has changed over time but almost all commercial banks are included in the data. In 2014, for example, any bank with assets above $43 million, with a branch in a metropolitan statistical area, and that originated at least one mortgage loan had to file a HMDA report. The HMDA data provide detailed information on loan applications and originations such as the date of an application and origination, loan amount and location, approval status, lender information as well as the information on mortgage applicants such as their income, sex, and race. The data also contain information as to whether a loan was purchased and held by a bank or originated and held.

We clean raw HMDA data, taking similar steps as those in Loutskina and Strahan (2009). We drop mortgages originated by savings institutions, mortgage bankers, credit unions, and other nonbank lenders. We then drop mortgages subsidized by the Federal Housing Authority, the Veterans Administration, or other government programs. We also drop applications with missing characteristics such as loan size, property location, or the bank's approval decision on the loan. We only keep home purchase loans for owner-occupied, principal dwelling homes. Finally, to exclude outliers, we drop individual mortgage loans smaller than $10,000 or larger than $10 million .

[6] Avery, Brevoort, and Canner (2007) provide an extensive discussion of HMDA data.

We identify jumbo loans using the county-level conforming loan limits provided by the Federal Housing Finance Agency (FHFA) for one-unit properties.[7] Prior to 2007:Q3, conforming loan limits were set at the national level and were adjusted annually to reflect inflation, increasing from $187,450 in 1990 to $417,500 in 2006.[8] Starting in 2007:Q3, conforming loan limits have varied across counties depending on whether a county belongs to a general or high cost area. Accordingly, we apply FHFA's nation-wide loan limits to data prior to 2007:Q3 and county-level loan limits to data starting in 2007:Q3. Approximately 25% of counties in the HMDA data do not have conforming loan limits listed in the FHFA data. For these counties, we replace missing values with conforming loan limits for general areas.

Next, we aggregate the loan-level information at the state, bank, and quarterly level to merge with banks' quarterly financial information from the merger-adjusted version of the public Call Report data.[9] Call Reports also provide information on a bank's headquarter location, which allows us to further merge the data with information on 323 U.S. gubernatorial elections across 48 states between 1990 and 2014 based on the home state of each bank. We exclude an observation if a bank does not originate, purchase or deny at least one loan, jumbo or not, in a given state in a given quarter. This step helps ensure banks in our sample have a footprint in the state's mortgage market. Because jumbo loans are not originated or purchased as frequently as conforming loans are, we apply the following procedure to distinguish banks that do not operate in the jumbo loan market from those that operate but happen to add no new jumbo loans to their balance sheets in a given quarter: For each 4-year election cycle, we only consider banks that either originate and hold or purchase and hold jumbo loans at least three out of four quarters in the year before an election. These data cleaning procedures result in 207,535 observations at the bank/state/quarter-level and 49,597 observations at the bank/quarter level.

Table 1 summarizes the loan and bank characteristics information. The information is shown at the bank/quarter level to better capture banks' financial information, which is re-

[7] https://www.fhfa.gov/DataTools/Downloads/Pages/Conforming-Loan-Limits.aspx

[8] Except for Alaska and Hawaii where limits are 50 percent higher.

[9] Each quarter, commercial banks must file either "Consolidated Reports of Condition and Income for a Bank with Domestic and Foreign Offices" (FFIEC 031) or "Consolidated Reports of Condition and Income for a Bank with Domestic Offices Only" (FFIEC 041), which are called Call Reports.

ported as aggregates across all states rather than at the state level. Each quarter, banks either originate and hold or purchase and hold an average of $11.14 million worth of jumbo loans and an average number of 17 jumbo loans nationwide. The median values are much smaller, suggesting a large variation across banks in their presence in the jumbo loan market. Note that these loans held are those that are not sold and hence held on the balance sheet of a bank at least until the end of the calendar year.[10] These loans represent about 0.28% of banks' total assets in each quarter. That is, about 0.28% of banks' assets worth of new jumbo loans are added to banks' balance sheets each quarter either through originations or purchases. This is in addition to existing jumbo loans in banks' balance sheets. When averaged at the bank/state/quarter level, the ratio is about 0.06% (untabulated). The ratio is smaller because the ratio constructed at the bank/state/quarter level uses for the denominator a bank's assets consolidated across all states in which the bank operates while using for the numerator a bank's jumbo mortgage activity at the state level. Turning to origination variables, the volume and number of jumbo loan origination is a bit larger than the corresponding volume and number of loans held with $14.82 million in volume and about 25 loans in number per quarter nationwide. This suggests that some of the jumbo loans banks originate are sold within the same calendar year.

Table 1 also reports banks' quarterly financial information drawn from Call Reports. Banks in our sample have an average of $6.8 billion in assets. Core deposits are about 69% of total assets and average return on equity is about 3% each quarter. These banks hold about 21% of their assets in the form of home mortgages loans, which consist of first and second lien mortgages and home equity loans. Three bank risk measures are reported: z-score, equity ratio, and credit risk.

Next, table 2 summarizes the characteristics of gubernatorial elections. The election information is primarily obtained from the CQ Press Voting and Elections Collection and is supplemented by Guide to U.S. Elections by Kalb (2015). All states in our sample have gubernatorial elections every 4 years. We exclude New Hampshire and Vermont, which have elections every two years. Elections in our data have an average vote margin of 15.8% where the vote margin is defined as the percentage difference of votes between the winner and runner-up. Using this

[10]Banks are required by the HMDA to report whether they have sold a loan by the end of the calendar year in which it was originated.

information, we construct an indicator variable, *Close*, which is set to one if an election outcome was determined by less than a 5-percent margin and zero otherwise. About a quarter of elections in our sample are classified as close. Similarly, we construct an indicator variable, *Wide*, which is set to one if an election outcome was determined by more than a 15-percent margin and zero otherwise. Next, *Term limited* is an indicator variable showing whether an incumbent governor faces a term limit imposed by the states electoral rules or not. In a quarter of elections in our sample, incumbent governors do not seek re-election due to term limits. Finally, the last row reports that new governors are elected in about a half of elections, leading to a change in leadership.

3. Methodology

A key feature of our empirical setting is that we use the timing of gubernatorial elections as a proxy for exogenous variations in policy uncertainty. The timing of elections is fixed by electoral law and out of the control of an individual bank, and hence, independent of economic conditions. Furthermore, different states hold gubernatorial elections in different years, allowing us to net out national business cycle effects. We construct election quarter indicators to capture the mortgage lending dynamics around elections. This setup enables us to exploit variations within a bank over time by comparing a bank's lending behavior in election quarters and non-election quarters. In addition, because banks headquartered in different states face gubernatorial elections in different years, we are able to compare, at a given point in time, banks facing elections in their home states and those that are not. In essence, we employ a difference-in-differences methodology and estimate the following specification:

$$Y_{i,s,t} = \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + X'\theta + \varepsilon_{i,s,t}. \quad (1)$$

The specification includes bank-state fixed effects ($\alpha_{i,s}$) and state/time fixed effects ($\alpha_{s,t}$), building on Khawaja and Mian (2008)'s identification strategy. We include firm-bank fixed effects to control for relationships between banks and states in which banks extend mortgage

loans. Including a full set of state/time fixed effects helps control for the time-varying demand for mortgage credit and other local economic conditions affecting banks' lending decisions in each state. The state-time fixed effects are analogous to firm-time fixed effects used in studies that focus on identifying the changes in supply from demand for C&I loans by controlling for time-varying observed and unobserved heterogeneity across borrowing firms (e.g, Jiménez et al (2012, 2014)). In our setting, including a full set of state-time fixed effects helps control for observed and unobserved heterogeneity across states that borrow from banks to identify changes in the mortgage loan supply. Note that state-time fixed effects do not absorb the election effect because many banks in our sample lend not only in their home states but also in foreign states. Also note that state/bank and state/time fixed effects in the panel regression specification absorb the effects on the lending by banks serving a single state, and thus the analysis implicitly focuses only on banks lending in multiple states.

For the dependent variable, we consider the type of loans that we consider relatively more irreversible, loans held in banks balance sheets and jumbo loans, in most of our analysis as the investment-uncertainty relation is predicted to be more negative for more irreversible assets.[11] Compared to loans that were just originated, loans that banks have held in their balance sheets for some time, so-called seasoned loans, are not easy to dispose, making them a relatively irreversible investment. Loans can become delinquent while in banks' possession, making it difficult for banks to sell at a later date. Even well-performing loans have to meet various requirements to be sold as seasoned loans. In the case of conforming loans, for Fannie Mae to buy seasoned loans, it requires, among other things, that the mortgage satisfy Fannie Mae's current applicable mortgage eligibility requirements, that the current value of the property not be less than the original value, and that the borrower's ability to pay not have changed adversely (Fannie Mae (2014)). Freddie Mac has similar requirements (Freddie Mac (2016)). Second, jumbo loans, those with an amount exceeding the conforming loan limit, cannot be purchased or securitized by government-sponsored enterprises (GSEs) such as Fannie Mae and Freddie Mac. The lack of government support makes jumbo loans less liquid than conforming

[11] In later sections, we utilize a broader universe of loans including non-jumbo loans and loans originated regardless of whether they were held in banks balance sheets or disposed.

loans, thus more irreversible.[12] In fact, most jumbo mortgages are held by the original lender while conforming loans are often sold upon origination.

The dependent variables include log(1+*Volume held*), log(1+*Number held*), and *Volume held*/lag(assets), where *Volume held* and *Number held* are, respectively, the volume and the number of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Note that we add one to *Volume held* before taking the logarithm.[13] This is because jumbo loans are originated or purchased relatively infrequently compared with conforming loans. Thus, it is possible *Volume held* becomes zero because a bank cut jumbo lending to zero in some quarters rather than because a bank does not operate in the jumbo loan market. Adding one ensures that such observations are not excluded. Standard errors are double clustered at the bank/state level as the analysis focuses on the lending behavior at the bank/state level.

Our main variables of interest are election quarter indicators, $Elect_{i,h,t+k}$ (k = -2, -1, 0, 1), which are set to one if bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. While the dependent variable is defined based on the state in which a bank extends a loan, election quarter variables are defined based on a bank's home state to capture the uncertainty arising from a bank's home-state election. $Elect_t$ is the quarter leading up to an election, the three-month period from September through November of the election year. Because elections take place in early November and because there is some lag between loan approval and origination, this definition captures the quarter leading up to an election more precisely than the last calendar quarter before an election, which is from July to September.[14] Coefficients on the election dummy variables can be interpreted as the difference in the within-bank conditional mean mortgage lending, controlling for other determinants of lending.

Finally, the specification includes various time-varying bank characteristics (X) that can affect banks mortgage lending decisions over time. We lag all bank-level controls by one quarter to alleviate a potential endogeneity concern. Size, defined as the logarithm of a bank's total inflation adjusted assets, may help explain banks' lending decision if larger banks behave

[12] For more on jumbo loans, see Ambrose, LaCour-Little, and Sanders (2004), Loutskina and Strahan (2009), Adelino, Schoar and Severino (2014), among others.

[13] Note that our data cleaning procedure, detailed in section 2, excludes observations for which *Volume held* is zero likely because a bank does not operate in the jumbo loan market.

[14] The results are similar when we define $Elect_{i,h,t}$ as the three months from August to October.

differently than small ones in the mortgage market. We also include home mortgage, defined as the sum of first lien and junior lien residential real estate loans and home equity loans as a fraction of total assets. A bank's mortgage lending decision can be affected by its business strategy as reflected in its concentration on home mortgage relative to its size. A bank's dependence on core deposits, measured as the ratio of core deposits to total assets, can affect a bank's willingness to extend mortgage credit. Core deposits can encourage risk-taking due to its stable nature as a funding source and deposit insurance associated with core deposits. Finally, a bank's profitability, measured by return on equity, may also affect its mortgage lending decision.

4. Mortgage Lending around Gubernatorial Elections

4.1. Bank–Level Analysis

We start with a bank-level analysis using data aggregated at the bank/quarter level, subsequently followed by a more granular analysis at the bank/state/quarter level. Table 3 shows the bank-level results. The first column uses log(1+*Volume held*) as the dependent variable, where *Volume held* is the volume of jumbo loans bank i either originates and holds or purchases and holds in quarter t across all states. Coefficients of $Elect_{t-2}$, $Elect_{t-1}$, and $Elect_t$ are all negative and all but one are statistically significant. The pattern is similar using as the dependent variable log(1+*Number held*) in column (2) and *Volume held*/lag(assets) in column (3), respectively. These results imply that banks' jumbo mortgage lending aggregated across all states declines when banks face gubernatorial elections in their home states.

An important drawback of this specification is that it cannot address the identification problem rising from changing loan demand at the state level. Different states hold gubernatorial elections in different years, resulting in varying degrees of uncertainty shocks across states in a given year. These state-level changes in demand cannot be accounted for by including nationwide macro trends or time trends. In the next sub-section, we utilize bank/state/quqarter level data to control for time-varying demand at the state level.

4.2. Baseline Results: Bank/State–Level Analysis

Table 4 reports the estimation results of the baseline specification (specification (1)) at the bank/state/quarter level. The first column uses log(1+*Volume held*) as the dependent variable. Note that *Volume held* is now defined at the state level. That is, *Volume held* is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Coefficients of $Elect_{t-2}$, $Elect_{t-1}$, and $Elect_t$ are all negative and statistically significant, suggesting that banks reduce jumbo mortgage lending when banks' home states hold elections. The magnitude of the reduction is economically large: The point estimates of the three coefficients range between -0.122 and -0.225, implying that, in the quarters leading up to an election, banks cut the volume of jumbo mortgage supply by between 13% (= $\exp(0.122)-1$) and 25% (= $\exp(0.225)-1$) relative to the volume in non-election quarters, controlling for various bank characteristics.

The election effect weakens after an election, but does not go away swiftly. The coefficient on $Elect_{t+1}$ remains negative, though smaller in magnitude than those on pre-election quarter variables. This lagged response is quite plausible considering that it takes time for a bank to process loan applications and originate loans. Thus, loans likely appear in banks' books with some lags. In addition, while the uncertainty over an election outcome is resolved upon an election, there is some lingering uncertainty about the elected governor's administration and agenda, more so in the case of a newly elected governor. Jens (2017), for example, points out that stock market volatility is higher for several months after a new governor is elected than when an incumbent is re-elected.[15]

The next column of table 4 uses log(1+*Number held*) as the dependent variable. The result is similar: Coefficients of $Elect_{t-2}$, $Elect_{t-1}$, and $Elect_t$ are all negative and significant. The magnitude of coefficients is smaller with the reduction of 4% to 6% in the number of loans compared with non-election quarters, controlling for various bank characteristics. These results suggest that larger jumbo loans are likely affected more in election years.

[15] See, also, Biakowski, Gottschalk, and Wisniewski (2008), Boutchkova, Doshi, Durnev, and Molchanov (2011), and Kelly, Pastor, and Veronesi (2016).

We find that coefficients of bank-level control variables generally have signs consistent with the literature. Bank size, measured as lagged bank assets, is positively correlated with jumbo mortgage lending in columns (1) and (2), implying that large banks have more presence in the jumbo mortgage market. Home mortgages also have positive coefficients. That is, banks with a higher concentration in the mortgage market extend more jumbo loans. Banks relying more on core deposits also tend to engage more in jumbo mortgage lending.

For robustness, the last column considers as the dependent variable the ratio of *Volume held* to the bank's assets from a year ago, multiplied by 100.[16] Because a bank' assets are not broken down to the state level in Call Reports, we use for the denominator a bank's assets consolidated across all states in which the bank operates while using for the numerator a bank's jumbo mortgage activity at the state level. This makes the ratio smaller than if state-level bank assets were used. Also note that the numerator captures the jumbo loans banks newly acquired and held in a given quarter, which is very small compared with existing jumbo loans in banks' books. The regression result is qualitatively similar to those in the first two columns: All three pre-election quarter variables have negative and significant coefficients. As expected, the coefficients are small, ranging between -0.006 and -0.009. This means that the ratio of newly held jumbo loans to a bank's assets declined between -0.006% and -0.009% in each of the pre-election quarters. This is a quite sizable change compared with the mean ratio of 0.06%.

Overall, the results have two important implications. First, policy uncertainty matters for banks' mortgage lending decisions. Second, the reduction in lending captured in the regressions reflects the reduction in both banks' home states and foreign states in which they provide mortgage credit. That means that policy uncertainty in one state has a spillover effect to other states through financial institutions serving multiple states.

[16]The loan volume is scaled by assets four quarters ago rather than by assets in the previous quarter to mitigate the potential seasonality issue associated with the quarterly frequency of the data.

5. Demand and Supply of Jumbo Mortgage Credit

While our results highlight an important transmission mechanism through which policy uncertainty is passed on to households, one may wonder whether our results are driven by a decline in demand for mortgage loans rather than by a decline in banks' credit supply. Our baseline specification includes state-time fixed effects, which help control for the time-varying demand for mortgage credit across states. In addition, because many banks in our sample operate in multiple states, we are able to compare banks exposed to same economic conditions but different degrees of uncertainty: Those facing elections in their home state and those operating in the same state but headquartered elsewhere. This section further examine the potential demand effect in several ways.

5.1. Economic Conditions Across States

We first examine state-level economic conditions. If general economic conditions are systematically worse in election years, they can depress the local housing market and the demand for mortgage credit. Table 5 reports summary statistics for state-level annual GDP growth rates and unemployment rates. We calculate mean values in two ways. First, we assign an equal weight to each state-year observation. Second, we calculate a sample-weighted average by assigning the same weight to each bank/state/quarter observation. The patterns are similar across the two types of averages. The patterns are also similar across election years and non-election years. For example, the equal-weighted average GDP growth rate is 2.74% for election years, slightly higher than the growth rate of 2.35% for non-election years. The the equal-weighted average unemployment rates are also similar with 5.69% for election years and 5.76% for non-election years. The similarity in economic conditions across election and non-election years suggests that the reduction in banks' jumbo mortgage lending is unlikely to be driven by changing state-level economic conditions.

5.2. County-Level Analysis

Similar state-level economic conditions across election and non-election years, shown in the previous section, as well as state-time fixed effects help address the potential demand-driven effect. However, local economic conditions may vary considerably even within a state, resulting in a differential effect on the demand for mortgage credit. Thus, we explore more granular geographical areas by focusing on counties instead of states as the geographical unit. Specifically, we aggregate our measures of jumbo mortgage credit variables to bank-county level. We estimate specification (1) at the bank/county/quarter level.

Table 6 reports the results. The number of observations increases to over 2 million, reflecting the finer level of the geographic unit. Election quarter timing variables are negative and significant, indicating that the pattern documented earlier remains unchanged when we examine the county-level bank mortgage lending, controlling for time-varying county-level economic conditions. These results provide additional support for the interpretation that lower mortage lendign in election years are unlikely to be driven by changes in demand for mortgage credit in response to local economic conditions. Note that the coefficients in column (3) are much smaller than those in earlier results because a bank's county-level mortgage lending volume is scaled by its total assets across all counties.

5.3. Jumbo Mortgage Credit in Home States vs. Foreign States

Next, we further investigate the question by comparing loans extended in banks' home states and those in their foreign states. If the results are solely driven by a decline in demand, the reduction in loans should be concentrated in banks' home states where uncertainty surrounding elections may depress demand for mortgage credit.

Specifically, we introduce interaction terms between our quarterly election dummies and a home state dummy, which takes a value of one if the lending takes place in a bank's home state. All regressions continue to include state-time fixed effects. Table 7 reports the results for the same dependent variables used in our baseline table 4: the volume and number of loans held, and the ratio of loans held to total assets. Across all three specifications, the

quarterly election dummies remain negative and significant, suggesting that banks cut back lending outside of their home states as well. Meanwhile, the interaction terms are negative, significant and large in the election quarter and the post-election quarter, despite being positive and generally significant in the two previous quarters. Taken together, the interaction terms suggest that banks first start cutting back the credit supply more in foreign states, possibly trying to maintain better relationship with their home state, but once the election comes close, cutting credit in the home state becomes unavoidable as well.

These results provide additional support for our interpretation that the estimated lending cycles around elections are at least partly driven by changes in banks' credit supply. Purely demand-driven changes around home states' elections are unlikely to reduce the volume and number of mortgage loans to banks' foreign states, where credit demand would remain stable on average.

5.4. Bank Characteristics and Sensitivity to Policy Uncertainty

This section examines whether there is heterogeneity across banks in their sensitivity to electoral uncertainty. In particular, we consider two bank characteristics. First, we test whether state-chartered banks and nationally chartered banks headquartered in the same state respond differently to uncertainty surrounding the state's gubernatorial election. We conjecture that state-chartered banks can be more sensitive to the change in their state's political leadership. State banks are subject to both state and federal supervision as state and federal banking regulators alternate examinations of state banks while national banks are only subject to federal banking supervision. In addition, a state's governor has a strong influence over the appointment of the head of the state banking regulators. The choice of state regulators is important to state banks as state regulators can implement identical rules differently than federal regulators due to differences in their institutional design and incentives and can counteract federal regulators' actions to some degree (Agarwal, Lucca, Seru, and Trebbi (2014)).

However, changes in a state's political landscape are not limited to bank regulation. They can affect both state and national banks headquartered in the state through various channels

such as state taxes, subsidies, budget, and procurement. Liu and Ngo (2014) argue that government plays a broad and active role in the banking sector and that banks consider political interference as a serious risk factor.[17] Thus, it is possible that the differential effect of elections on state banks are only marginal. In addition, legislation has strengthened the regulatory authority of the federal regulators relative to that of state regulators over time, potentially mitigating the differential effect (Leverty and Grace (2016)).

The second bank characteristic that we consider is banks' risk-taking behavior. Banks' risk-taking pattern has been documented to be associated with the probability of their survival, especially during crises.[18] Similarly, electoral uncertainty may matter more to risky banks because they are likely more vulnerable to changes in policy regimes. On the other hand, banks' risk-taking tendency may persist over time, leading more risky banks to react less to the uncertainty surrounding elections. We construct three risk indicators based on each of the following three bank risk measures: z-score, equity ratio, and credit risk. Z-score estimates a bank's capital and return buffers with respect to its return volatility to evaluate the bank's distance to default. Equity ratio measures a bank's leverage and is considered an important measure of a bank's soundness and stability. Credit risk, measured as the ratio of risk-weighted assets to total assets, indicates how risky a bank's asset combination is and is positively associated with a bank's probability of default.

To test these hypotheses, we augment our baseline specification as follows to allow for interactions between bank characteristics and election quarter variables:

$$\begin{aligned} Y_{i,s,t} &= \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + \sum_{k=-2}^{1} \gamma_k \text{Elect}_{i,h,t+k} \cdot \text{Z}_{i,h,t} \\ &\quad + \delta \text{Z}_{i,h,t} + X'\theta + \varepsilon_{i,s,t}, \end{aligned}$$

where Z is the bank characteristic variable of interest. For the state bank hypothesis, the bank characteristic variable is *State bank*, which is set to one if the given bank is state-chartered and

[17] Related, Leverty and Grace (2017) and Kroszner and Strahan (1996) document government intervention in the U.S. insurance industry and thrift, respectively, and Dinç (2005) and Brown and Dinç (2005) document government intervention in banks in developing countries.

[18] For example, see Beltratti and Stulz (2012), Cole and White (2012), Berger and Bouwman (2013), DeYoung and Torna (2013), and Kara and Vojtech (2017).

zero if nationally chartered. For the risk-taking hypothesis, the bank characteristic variable is *High risk*, an indicator set to one if the value of a bank risk measure is in the top tercile of the distribution in terms of the riskiness. For z-score and equity ratio, for which higher values indicate less risk, *High risk* is set to one if the value of the risk measure is in the bottom tercile of the distribution. For credit risk, for which higher value means higher risk, *High risk* is set to one if the value is in the top tercile of the distribution. We use risk measures lagged by four quarters to minimize endogeneity concerns.

Table 8 reports the results. In the first column, we test whether state-chartered banks and national banks headquartered in the state respond differently to uncertainty surrounding the state's elections. Interaction terms are all negative and two of the coefficients, $Elect_{t-1} \times$ *State bank* and $Elect_t \times$ *State bank*, are statistically significant at the 5% and 1% levels, respectively. It means that state banks are more sensitive to uncertainty surrounding gubernatorial elections than national banks. However, it does not mean that the uncertainty coming from gubernatorial elections is limited to risks associated with state-level banking supervision. National banks also cut jumbo mortgage lending around elections as indicated by negative and significant pre-election quarter variables. One caveat is that state banks can choose to switch to national banks and vice versa. However, it is a very rare event and is unlikely to affect the results.[19]

The next three columns interact high-risk indicators with election quarter variables. Election quarter variables are all negative and mostly significant, indicating that less risky banks cut jumbo mortgage lending around elections. Turning to interaction terms, we observe that some election quarter variables interacted with high-risk indicators have negative and significant loadings, implying that more risky banks react a bit more to electoral uncertainty than less risky banks. When *High risk* constructed based on z-score values is used in column (2), *High risk* $\times Elect_{t-2}$ has a negative and significant loading. When equity ratio and credit risk values are used to construct *High risk* indicators in columns (3) and (4), respectively, *High risk* indicators interacted with $Elect_{t-2}$ and $Elect_{t-1}$ have negative and significant loadings. These results suggest that, earlier in the election year, more risky banks tend to reduce the supply of jumbo mortgage credit more than less risk banks. When elections are near, however, risky

[19] 6% of banks in our jumbo-loan sample switched between state and national charters once during our sample period and 0.5% switched twice.

banks reduce lending at about the same pace as less risky banks. Results are qualitatively the same when we reconstruct *High risk* indicators using different cutoff values of underlying risk measures (unreported).

6. Election Characteristics and Sensitivity to Policy Uncertainty

This section exploits various election characteristics to further examine whether the documented lending cycle is indeed driven by the uncertainty generated by elections. If the reduction in lending was driven by uncertainty, the effect would likely be higher when there is a higher degree of uncertainty over future policy. In some cases, election outcomes are predicted with a great deal of confidence prior to the election date. However, other elections are characterized by very close races in which the outcome is highly uncertain until the day of the election. We investigate variation in electoral uncertainty by using vote margins as a proxy for the degree of uncertainty. We construct a dummy variable, *Close*, which is set to one if the vote margin in an election is less than 5%, and zero otherwise, where the vote margin is defined as the difference between the proportion of the votes garnered by the winner and the proportion received by the runner-up. We also construct an indicator variable, *Wide*, to capture elections with wide victory margins, which are likely to be associated with less uncertainty. *Wide* is set to one if the vote margin is more than 15% and zero otherwise. Among elections in our sample, 26% are classified as close elections and 42% as wide-margin elections (table 2).

A caveat is that the vote margin captures a realized election outcome, and thus an imperfect measure of perceived uncertainty prior to an election. Unfortunately, broad polling data capturing the degree of uncertainty prior to an election is not generally available. To complement it, we consider a measure indicating whether an incumbent governor faces a term limit imposed by the state's electoral rules. A term limit is predetermined, rending the measure clearly exogenous. Previous studies document that the advantage of incumbency is an important predictor of the election outcome: If an incumbent governor faces a term limit and,

thus, cannot run for re-election, competition surrounding the election is likely more fierce and the uncertainty about the election outcome are likely higher. To capture the variation in the incumbency advantage across elections, we define an indicator variable, *Term limited*, which is set to one if an incumbent faces a term limit and zero otherwise. In our sample, incumbents face term limits in about 25% of elections (table 2).

We augment the baseline specification as follows to allow for interactions between election characteristics and election quarter variables:

$$\begin{aligned} Y_{i,s,t} &= \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + \sum_{k=-2}^{1} \gamma_k \text{Elect}_{i,h,t+k} \cdot \text{Z}_{i,h,t} \\ &\quad + X'\theta + \varepsilon_{i,s,t}, \end{aligned}$$

where Z is the election characteristics variable of interest including *Close*, *Wide*, and *Term limited*.

Table 9 reports the results. Only the election quarter variables and their interaction terms are reported in the table to save space. Column (1) uses *Close* as the election characteristics variable. All election quarter variables have negative and significant coefficients. In addition, interaction terms are all negative and, in particular, the coefficient of $Elect_{t-1} \times Close$, -0.107, is large in magnitude and statistically significant. The coefficient suggests that banks lower the volume of jumbo loans they either originate and hold or purchase and hold in that quarter by 11% more in close elections than in other elections. This finding suggests that the effect of electoral uncertainty is more pronounced in close election races where uncertainty about election outcome tends to be higher. Turning to column (2), we see that all election quarter variables remain negative and significant. Consistent with our prediction, interaction terms are generally positive and significant, implying that cycles in mortgage lending around elections are less pronounced when races are highly predictable. Finally, column (3) interacts *Term limited* with election quarter variables. As predicted, interaction terms have negative and statistically significant coefficients. This means that banks cut credit supply more when an incumbent governor cannot run for re-election due to term limits, likely because uncertainty is higher in those elections. Also noteworthy is that the economic magnitude and statisti-

cal significance is most pronounced with *Term limited*, which is likely a cleaner measure of uncertainty than the vote margin variables.

Overall, the results in this section are consistent with the interpretation that mortgage credit supply declines more when uncertainty about the election outcome is higher. That is, the pattern in the data are likely driven by uncertainty surrounding elections. We also note that these results are consistent with the view described in the previous section that, after an election, there is some lingering uncertainty about the elected governor's administration and agenda. The dampening election effect is slower to go away after close elections and after elections where the governor faces a term-limit. The interaction terms, $Elect_{t+1} \times Close$ and $Elect_{t+1} \times Term\ limited$ are both negative and significant. The post-election negative effect is stronger for term-limited elections, where lingering uncertainty is likely higher since a new governor replaces the incumbent regardless of the election outcome. Meanwhile, the election effect is nearly gone following a wide-margin election: The sum of the coefficient of $Elect_{t+1}$ (-0.182) and that of $Elect_{t+1} \times Wide$ (0.182) is zero. That is, close elections and term-limited elections appear to be highly contested and have more unresolved uncertainty even after the election outcome is revealed.

7. Additional Tests

7.1. Jumbo Loan Origination

The analyses so far have examined the volume and number of jumbo mortgage loans banks either originated and held or purchased and held in their balance sheets. In this section, we consider alternative measures of jumbo mortgage credit–the volume and number of jumbo mortgage loans banks originate in each state and each quarter regardless of whether they hold or sell the loans. These measures also exclude loans purchased rather than originated. These origination variables include loans that are sold soon after origination, a relatively more reversible form of investment. In the models of investment under uncertainty, irreversibility increases the information value of waiting to invest. Thus, the investment-uncertainty relation

is likely more negative for more irreversible assets. To the extent that origination variables capture investment that is relatively less costly to reverse, the mortgage credit cycle may be less pronounced than when loans held were used in table 4. On the other hand, the results may be similar because jumbo mortgages are often held by the original lender rather than being sold upon origination.

Table 10 estimates the baseline specification using three origination variables: (1) log(1+ *Volume originated*), where *Volume originated* is the volume of jumbo loans bank *i* originates in state *s* in quarter *t*, (2) log(1+*Number originated*), and (3) the ratio of *Volume originated* to the bank's assets from a year ago. The results are qualitatively the same as those in table 4 with all three pre-election quarter variables showing negative and significant coefficients. However, the economic magnitude is generally smaller. Column (1) shows that the coefficients of pre-election quarter variables range between -0.079 and -0.110, indicating a decline in the quarterly jumbo mortgage origination volume of about 8-12% relative to the volume in non-election quarters. This is much smaller than a reduction of 13-25% in table 4 using *volume held*. Similarly, column (2) shows that the coefficients are smaller than the corresponding values in the baseline results. Column (3) shows that the ratio of *Volume originated* to lagged assets declined between 0.007% and 0.011%, slightly more than the decline of 0.006% and 0.009% in table 4 using *volume held/lag(assets)*. This is likely because the origination volume, which is on average larger than the volume held, declines more in terms of the dollar amount and hence more as a fraction of assets while declining less as a fraction of previous volume than the volume held.

7.2. Conforming Loans

In this section, we explore an alternative sample of loans–conforming loans. Because conforming loans can be sold to GSEs, they can be viewed as relatively more reversible investment than jumbo loans. However, conforming loans are also, to some extent, costly to reverse. Seasoned loans need to meet various requirements to be sold to GSEs. Even the loans

that are sold upon origination carry some non-balance-sheet risks such as put back risk.[20] We test whether the mortgage credit cycle is still present in banks' conforming-loan investment. For consistency, we construct the conforming-loan sample in the same way as we did our jumbo-loan sample by following the data-cleaning procedures described in section 2. As we did with jumbo loans, for each 4-year election cycle, we only consider banks that either originate and hold or purchase and hold loans in at least three out of four quarters in the year before an election. The final data contain 450,597 observations at the bank/state/quarter level. Note that the conforming-loan sample has more observations as many banks extending conforming loans do not operate in the jumbo-loan market.

Table 11 repeats the regressions in table 4 using the new sample. Similar to jumbo-loan regression results, all election quarter variables have negative and significant loadings. This finding suggests that the mortgage credit cycle around elections is generally present in the mortgage loan market, not just in the jumbo loan market. However, the magnitude differ somewhat. The election effect on the volume of conforming loans appears less pronounced than in the baseline results using jumbo loans: Column (1) shows that the coefficients of pre-election quarters range between -0.092 and -0.157, compared with the range of -0.122 and -0.225 in table 4. This implies that the quarterly volume of conforming loans that banks either originate and hold or purchase and hold drops by about 10–17% compared with the volume in non-election quarters, controlling for various bank characteristics. The election effect on the number of conforming loans, on the other hand, seems somewhat more pronounced. Column (2) shows that the coefficients range between -0.065 and -0.092 while the corresponding coefficients in the baseline result range between -0.042 and -0.062. Note that larger reduction in the number of loans does not necessarily translate into larger reduction in the volume because conforming loans are much smaller in size.

[20]For more detail, see Tarullo (2010), which describes former Federal Reserve Governor Daniel Tarullo's testimony before the U.S. Senate Committee on Banking, Housing, and Urban Affairs.

7.3. Robustness Checks

In this section, we perform a few robustness checks. We use log(1+*Volume held*) as the dependent variable for these regressions. In the first column of Table 12, we repeat the baseline regression shown in table 4 using pseudo election dates, which are constructed by, for each state, randomly selecting a year in which a state does not hold an election and treating the year and every four years after the year as the election years for the state. If our results are indeed driven by electoral uncertainty, the credit cycle documented in earlier sections should not be present in pseudo election years. The results in column (1) show that the volume of jumbo mortgage loan supply does not decline in the pseudo election years, consistent with our prediction.

Next, we address the concern that the pattern in the data might be driven by uncertainty surrounding presidential elections as the timing of some gubernatorial elections coincides with that of presidential elections. We repeat our baseline regression excluding states for which gubernatorial elections take place in the same year as presidential elections. That is, all banks headquartered in these states are excluded from the sample. Column (2) reports the result: Election quarter variables remain negative and significant, suggesting that the documented credit cycle is present outside presidential-election years as well.

Finally, we examine whether the result changes when we exclude three large states (New York, California, and Florida). If our result was driven by an idiosyncratic pattern that may be present in only a handful of large states, then the result is not likely to hold when these states with large observations are removed from the sample. We exclude all jumbo loans extended to these three states and estimate our baseline specification. Column (3) shows that the election quarter variables have negative and significant coefficients, similar to earlier findings.

8. Conclusion

We examine the relationship between banks' supply of jumbo mortgage credit and policy uncertainty using the timing of U.S. gubernatorial elections as a source of plausibly exogenous

variation in policy uncertainty. We document that when banks face gubernatorial elections in their home states, they reduce the volume and number of jumbo loans that they either originate and hold or purchase and hold each quarter relative to non-election quarters. Reduction in lending is observed both in the state in which banks are headquartered and in foreign states. The result has two important implications. First, policy uncertainty matters for banks' mortgage lending decisions. Second, policy uncertainty in one state has a spillover effect to other states through lending by financial institutions serving multiple states. The documented effect is unlikely to be driven by changes in demand. All regressions include state-time fixed effects, which help control for the time-varying demand for mortgage credit across states. Furthermore, the estimated mortgage credit cycle around elections is present in banks' foreign states as well.

The jumbo mortgage credit cycle around elections is more pronounced when there is a higher degree of uncertainty over the election outcome, as measured by vote margins and incumbent governors' term limits. We also document that some banks are more sensitive to policy uncertainty than others: State banks and risky banks cut jumbo mortgage supply more likely because they are more vulnerable to increased policy uncertainty. The results remain basically unchanged to various robustness checks. The cycle is also present when origination variables are considered and when a sample inclusive of both jumbo and non-jumbo loans is employed. Overall, the results show that policy uncertainty has a real effect on residential housing markets through banks' mortgage credit decisions.

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Figure 1. Unconditional Mean Jumbo Mortgage Credit

This figure depicts unconditional mean jumbo mortgage credit banks extend when they face elections in their headquarter states (shown in red, perforated line) and when they do not (shown in blue solid line). y-axis captures log(1+Volume Held), where Volume Held is the volume of jumbo loans bank *i* either originates and holds or purchases and holds in state *s* in quarter 0. x-axis captures the quarters around elections and corresponding non-election year quarters. In election years, quarter 0 is the last quarter leading up to a gubernatorial election.

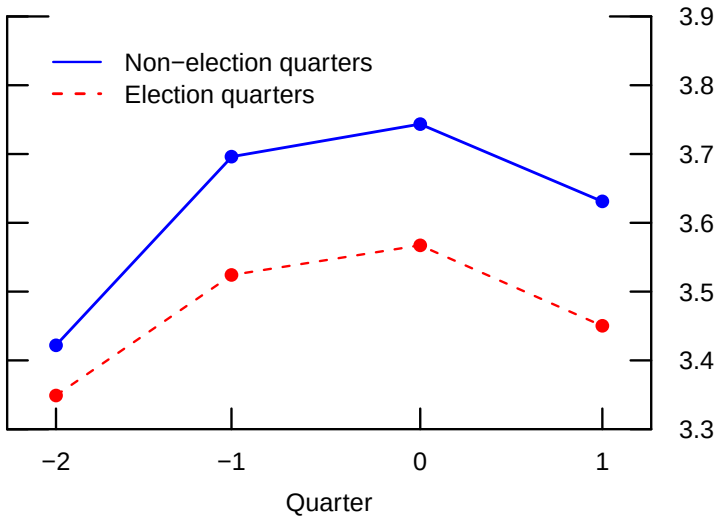

Figure 2. Conditional Mean Jumbo Mortgage Credit Around Elections

These figures depict the volume of jumbo mortgage credit supply relative to non-election quarters, controlling for various fixed effects and bank characteristics. In figure (a), y-axis plots coefficients of the election timing dummy variables of the following specification:

$$Y_{i,s,t} = \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + X'\theta + \varepsilon_{i,s,t},$$

where the dependent variable is log(1+Volume Held), the logarithm of the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. x-axis shows four quarters around elections, where quarter 0 indicates the last quarter leading up to a gubernatorial election. In figure (b), x-axis is extended to show six quarters around elections. y-axis plots coefficients of the election timing dummy variables of a modified specification, where two more quarters are added to the baseline specification.

Figure (a): 4 Quarters Around Elections

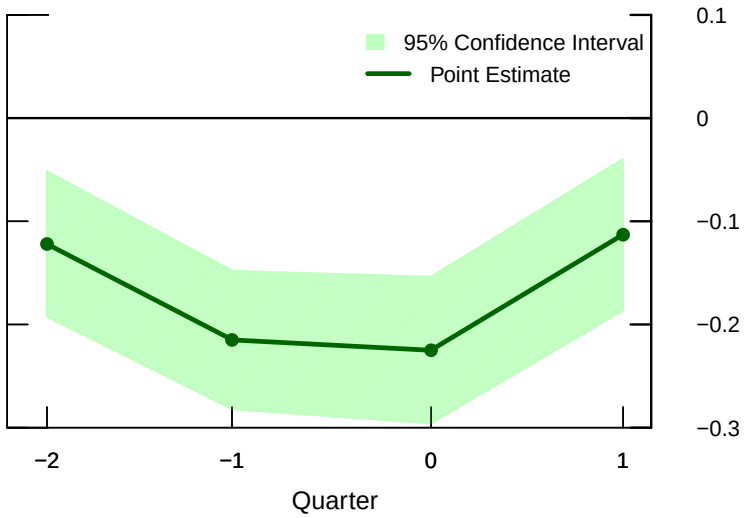

Figure (b): 6 Quarters Around Elections

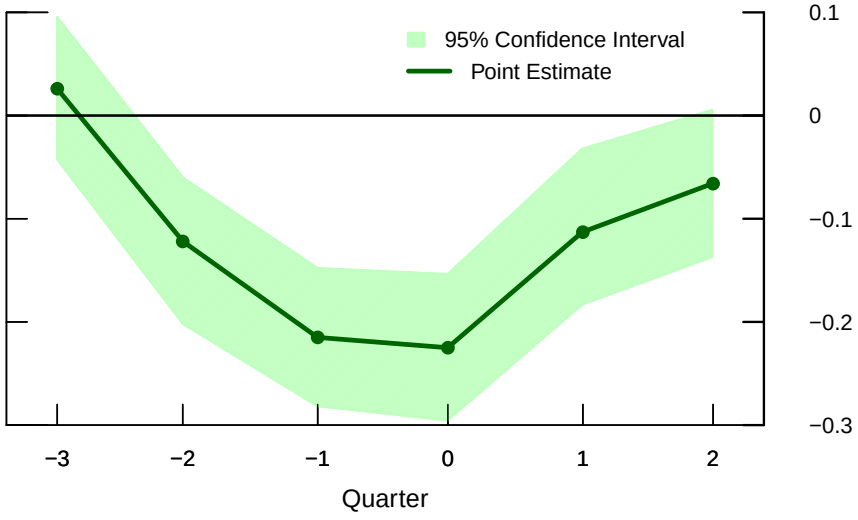

Table 1
Summary Statistics

This table summarizes our loan variables and various bank characteristics at the bank-quarter level. All dollar values are shown in the 2010:Q1 value. Bank-level control variables are lagged by one quarter for regressions. See Appendix for variable definitions.

	N	Mean	Median	Std. Dev.
Loan Variables				
Volume of jumbo loans held$_{i,t}$ (unit: \$M)	49,597	11.14	1.04	45.92
Number of jumbo loans held$_{i,t}$	49,597	17.26	2	68.64
Volume of jumbo loans held$_{i,t}$/Total assets$_{i,t-4}$ (%)	49,366	0.28	0.11	0.49
Volume of jumbo loans originated$_{i,t}$ (unit: \$M)	49,597	14.82	1.28	61.15
Number of jumbo loans originated$_{i,t}$	49,597	24.88	2	101.05
Volume of jumbo loans originated$_{i,t}$/Total assets$_{i,t-4}$ (%)	49,366	0.37	0.13	0.71
Other Variables				
Total assets$_{i,t-1}$ (unit: \$B)	49,597	6.84	0.88	22.33
Core deposits$_{i,t-1}$	49,597	0.69	0.71	0.13
ROE$_{i,t-1}$	49,597	0.03	0.03	0.02
Home mortgages$_{i,t}$	49,597	0.21	0.19	0.11
State bank$_i$	49,597	0.59	1.00	0.49
Z-score$_{i,t-4}$	48,200	196.00	153.46	165.92
Equity ratio$_{i,t-4}$	49,366	0.09	0.08	0.03
Credit risk$_{i,t-4}$	48,914	0.69	0.70	0.12
Elect$_t$	49,597	0.24	0	0.43

Table 2
Election Characteristics

The table reports summary statistics for 323 gubernatorial elections held between 1990 and 2014 in 48 U.S. states. All states in our sample have gubernatorial elections every 4 years. New Hampshire and Vermont, which have elections every two years, are excluded from the sample. See Appendix for variable definitions.

Election variables	N	$I = 1$	Mean	Median	Std. Dev.
Vote Margin (%)	323		15.84	12.67	13.40
Close	323	83	0.26	0	0.44
Wide	323	137	0.42	0	0.49
Term limited	323	80	0.25	0	0.43
New governor	323	172	0.53	1	0.50

Table 3
Jumbo Mortgage Lending around Gubernatorial Elections: Bank–Level Analysis

This table presents estimation results of the following specification:

$$Y_{i,t} \quad = \quad \alpha_i + \alpha_t + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + X'\theta + \varepsilon_{i,t},$$

where dependent variables are (1) log(1+Volume held), (2) log(1+Number held), and (3) Volume held/lag(assets), where lag(assets) are banks' assets from a year ago. Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in quarter t. Number held is the number of such loans. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. $Elect_t$ is the quarter leading up to an election, the three-month period from September through November of the election year. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. Note that all control variables are lagged by a quarter. The specification includes bank fixed effects as well as time fixed effects. Standard errors clustered at the bank level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1) log(1+Volume held)	(2) log(1+Number held)	(3) Volume held/lag(assets)
$Elect_{t-2}$	-0.078	-0.035*	-0.006
	[0.080]	[0.021]	[0.011]
$Elect_{t-1}$	-0.265***	-0.061***	-0.023**
	[0.080]	[0.021]	[0.011]
$Elect_t$	-0.445***	-0.109***	-0.034***
	[0.080]	[0.021]	[0.011]
$Elect_{t+1}$	-0.564***	-0.129***	-0.041***
	[0.080]	[0.021]	[0.011]
Size	0.787***	0.428***	-0.119***
	[0.040]	[0.010]	[0.006]
Home mortgages	3.273***	1.728***	0.534***
	[0.252]	[0.066]	[0.035]
Core deposits	-0.608***	-0.197***	-0.137***
	[0.219]	[0.057]	[0.031]
Return on equity	2.109***	0.553***	-0.366***
	[0.697]	[0.182]	[0.098]
Bank Fixed Effects	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
Observations	49,597	49,597	49,365
R^2	0.470	0.747	0.469

Table 4
Jumbo Mortgage Lending around Gubernatorial Elections: Bank/State–Level Analysis

This table presents estimation results of the following specification:

$$Y_{i,s,t} = \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + X'\theta + \varepsilon_{i,s,t},$$

where dependent variables are (1) log(1+Volume held), (2) log(1+Number held), and (3) Volume held/lag(assets), where lag(assets) are banks' assets from a year ago. Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Number held is the number of such loans. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. $Elect_t$ is the quarter leading up to an election, the three-month period from September through November of the election year. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. Note that all control variables are lagged by a quarter. The specification includes bank×state fixed effects as well as state×time fixed effects. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1)	(2)	(3)
Variables	log(1+Volume held)	log(1+Number held)	Volume held/lag(assets)
$Elect_{t-2}$	-0.122***	-0.047***	-0.007***
	[0.036]	[0.008]	[0.001]
$Elect_{t-1}$	-0.215***	-0.042***	-0.009***
	[0.034]	[0.008]	[0.001]
$Elect_t$	-0.225***	-0.062***	-0.006***
	[0.036]	[0.008]	[0.001]
$Elect_{t+1}$	-0.113***	-0.043***	-0.009***
	[0.037]	[0.008]	[0.001]
Size	0.550***	0.242***	-0.025***
	[0.044]	[0.015]	[0.002]
Home mortgages	2.876***	0.902***	0.048***
	[0.228]	[0.077]	[0.013]
Core deposits	0.355	0.193***	0.032***
	[0.236]	[0.073]	[0.008]
Return on equity	-0.259	-0.134	-0.049**
	[0.413]	[0.117]	[0.022]
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	207,535	207,535	206,544
R^2	0.574	0.677	0.585

Table 5
Economic Conditions Across States

The table reports two measures of state-level economic conditions for election and nonelection years: (1) the average annual growth rate in real GDP and (2) the average annual unemployment rate. These rates are reported in two ways. First, the equal-weighed average assigns the same weights to each state-year. Second, the sample-weighed average assigns the same weights to each bank/state/quarter observation.

	Equal-Weighted Across States/Years		Sample-Weighted Averages	
	Election Years	Nonelection Years	Election Years	Nonelection Years
Real GDP Growth (%)				
Mean	2.74	2.35	2.30	2.86
S.D.	[2.82]	[2.92]	[2.80]	[2.58]
Unemployement Rate (%)				
Mean	5.69	5.76	5.69	5.66
S.D.	[1.86]	[1.88]	[1.80]	[1.83]

Table 6
Bank/County–Level Analysis

This table presents estimation results of the following specification:

$$Y_{i,c,t} = \alpha_{i,c} + \alpha_{c,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + X'\theta + \varepsilon_{i,c,t},$$

where dependent variables are (1) log(1+Volume held), (2) log(1+Number held), and (3) Volume held/lag(assets), where lag(assets) are banks' assets from a year ago. Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in county c in quarter t. Number held is the number of such loans. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. $Elect_t$ is the quarter leading up to an election, the three-month period from September through November of the election year. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. Note that all control variables are lagged by a quarter. The specification includes bank×county fixed effects as well as county×time fixed effects. Standard errors double clustered at the bank×county level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1) log(1+Volume held)	(2) log(1+Number held)	(3) Volume held/lag(assets)
$Elect_{t-2}$	-0.086***	-0.017***	-0.001***
	[0.007]	[0.001]	[0.000]
$Elect_{t-1}$	-0.050***	-0.010***	-0.001***
	[0.007]	[0.001]	[0.000]
$Elect_t$	-0.068***	-0.015***	-0.000***
	[0.008]	[0.001]	[0.000]
$Elect_{t+1}$	-0.071***	-0.016***	-0.001***
	[0.008]	[0.001]	[0.000]
Size	0.217***	0.052***	-0.002***
	[0.009]	[0.002]	[0.000]
Home mortgages	0.752***	0.160***	0.000
	[0.037]	[0.008]	[0.001]
Core deposits	0.846***	0.170***	0.005***
	[0.043]	[0.009]	[0.000]
Return on equity	-0.183**	-0.033*	-0.000
	[0.093]	[0.018]	[0.001]
Bank-County Fixed Effects	Yes	Yes	Yes
County-Time Fixed Effects	Yes	Yes	Yes
Observations	2,268,856	2,268,856	2,263,395
R^2	0.533	0.612	0.561

Table 7
Jumbo Mortgage Lending in Home States vs. Foreign States

This table reports estimation results of the following specification :

$$Y_{i,s,t} = \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + \sum_{k=-2}^{1} \gamma_k \text{Elect}_{i,h,t+k} \cdot Z_{i,h,t} + \delta Z_{i,h,t} + X'\theta + \varepsilon_{i,s,t},$$

where dependent variables are (1) log(1+Volume held), (2) log(1+Number held), and (3) Volume held/lag(assets), where lag(assets) are banks' assets from a year ago. Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Number held is the number of such loans. Z is a dummy variable equal to one for lending that was conducted in the bank's home state and 0 otherwise. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. X is a set of time-varying, bank-level control variables including size, home mortgages, core deposits, and return on equity. All control variables are lagged by a quarter. Note that only election variables and their interaction terms are reported. The specification includes bank×state fixed effects as well as state×time fixed effects. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1)	(2)	(3)
Variables	log(1+Volume held)	log(1+Number held)	Volume held/lag(assets)
$Elect_{t-2}$	-0.146***	-0.059***	-0.006***
	[0.037]	[0.008]	[0.001]
$Elect_{t-1}$	-0.215***	-0.054***	-0.010***
	[0.035]	[0.008]	[0.001]
$Elect_t$	-0.124***	-0.043***	-0.000
	[0.037]	[0.009]	[0.001]
$Elect_{t+1}$	0.085**	0.003	0.005***
	[0.039]	[0.009]	[0.001]
$Elect_{t-2} \times Home\ state$	0.163**	0.076***	-0.003
	[0.063]	[0.014]	[0.004]
$Elect_{t-1} \times Home\ state$	0.020	0.074***	0.011***
	[0.062]	[0.015]	[0.004]
$Elect_t \times Home\ state$	-0.576***	-0.108***	-0.036***
	[0.067]	[0.016]	[0.004]
$Elect_{t+1} \times Home\ state$	-1.105***	-0.261***	-0.078***
	[0.073]	[0.016]	[0.004]
Bank-level controls	Yes	Yes	Yes
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	207,535	207,535	206,544
R^2	0.575	0.678	0.587

Table 8
Bank Characteristics and Sensitivity to Policy Uncertainty

This table reports estimation results of the following specification :

$$\begin{aligned} Y_{i,s,t} &= \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + \sum_{k=-2}^{1} \gamma_k \text{Elect}_{i,h,t+k} \cdot \text{Z}_{i,h,t} \\ &\quad + \delta \text{Z}_{i,h,t} + X'\theta + \varepsilon_{i,s,t}, \end{aligned}$$

where the dependent variable is log(1+Volume held). Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Z is the bank characteristic variable of interest. In column (1), the bank characteristic variable is *State bank*, which is set to one if the given bank is state-chartered and zero if nationally chartered. The bank characteristic variable used in columns (2) through (4) is $High\ risk$, which is set to one if the value of a risk measure is in the top tercile of the distribution in terms of the riskiness. Three risk measures are employed: z-score, equity ratio, and credit risk. For z-score in column (2) and equity ratio in column (3), for which higher values indicate less risk, *High risk* is set to one if the value is in the bottom tercile of the distribution. For credit risk in column (4), for which higher value means higher risk, *High risk* is set to one if the value is in the top tercile of the distribution. All three risk measures are lagged by four quarters. $Elect_{i,h,t+k} (k = -2, -1, 0, 1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. X is a set of time-varying, bank-level control variables including size, home mortgages, core deposits, and return on equity. All control variables are lagged by a quarter. Note that only election variables and their interaction terms are reported. The specification includes bank$\times$state fixed effects as well as state$\times$time fixed effects. Standard errors double clustered at the bank$\times$state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

Variables	(1) State banks	(2) Z-score	(3) Equity ratio	(4) Credit risk
$Elect_{t-2}$	-0.120***	-0.066	-0.082**	-0.012
	[0.041]	[0.041]	[0.039]	[0.045]
$Elect_{t-1}$	-0.164***	-0.211***	-0.178***	-0.159***
	[0.039]	[0.040]	[0.038]	[0.041]
$Elect_t$	-0.134***	-0.216***	-0.208***	-0.179***
	[0.041]	[0.040]	[0.040]	[0.043]
$Elect_{t+1}$	-0.072	-0.151***	-0.101**	-0.143***
	[0.044]	[0.043]	[0.043]	[0.045]
$Elect_{t-2} \times State\ bank$	-0.001			
	[0.046]			
$Elect_{t-1} \times State\ bank$	-0.115**			
	[0.045]			
$Elect_t \times State\ bank$	-0.204***			
	[0.048]			
$Elect_{t+1} \times State\ bank$	-0.091*			
	[0.053]			
$Elect_{t-2} \times High\ risk$		-0.142***	-0.104**	-0.192***
		[0.053]	[0.050]	[0.047]
$Elect_{t-1} \times High\ risk$		0.001	-0.115**	-0.099**
		[0.052]	[0.048]	[0.045]
$Elect_t \times High\ risk$		-0.025	-0.054	-0.070
		[0.052]	[0.051]	[0.047]
$Elect_{t+1} \times High\ risk$		0.100*	-0.039	0.087*
		[0.055]	[0.055]	[0.053]
Bank-level controls	Yes	Yes	Yes	Yes
Bank-State Fixed Effects	Yes	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes	Yes
Observations	207,535	202,131	206,544	205,303
R^2	0.574	0.575	0.574	0.575

Table 9
Election Characteristics and Sensitivity to Policy Uncertainty

This table presents estimation results of the following specification:

$$Y_{i,s,t} = \alpha_{i,s} + \alpha_{s,t} + \sum_{k=-2}^{1} \beta_k \text{Elect}_{i,h,t+k} + \sum_{k=-2}^{1} \gamma_k \text{Elect}_{i,h,t+k} \cdot Z_{i,h,t} + X'\theta + \varepsilon_{i,s,t},$$

where the dependent variable is log(1+Volume held), where Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Z is the election characteristics variable including *Close*, *Wide*, and *Term Limited*. *Close* is an indicator variable set equal to one if the vote difference in an election is less than 5%, and zero otherwise, where vote difference is defined as the difference between the proportion of the votes garnered by the winner and that received by the runner-up. Similarly, *Wide* is set to one if the vote difference in an election is more than 15%, and zero otherwise. *Term Limited* is equal to one if an incumbent governor faces a binding term limit and cannot run for re-election, and zero otherwise. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. All control variables are lagged by a quarter. Note that only election variables and their interaction terms are reported. The specification includes bank×state fixed effects as well as state×time fixed effects. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

Variables	(1) Close	(2) Wide margin	(3) Term limited
$Elect_{t-2}$	-0.122***	-0.122***	-0.060
	[0.037]	[0.041]	[0.041]
$Elect_{t-1}$	-0.190***	-0.256***	-0.104***
	[0.036]	[0.038]	[0.040]
$Elect_t$	-0.221***	-0.268***	-0.142***
	[0.038]	[0.040]	[0.042]
$Elect_{t+1}$	-0.082**	-0.182***	-0.052
	[0.040]	[0.043]	[0.043]
$Elect_{t-2} \times Close$	-0.002		
	[0.059]		
$Elect_{t-1} \times Close$	-0.107*		
	[0.059]		
$Elect_t \times Close$	-0.017		
	[0.061]		
$Elect_{t+1} \times Close$	-0.131*		
	[0.071]		
$Elect_{t-2} \times Wide$		0.000	
		[0.052]	
$Elect_{t-1} \times Wide$		0.105**	
		[0.050]	
$Elect_t \times Wide$		0.113**	
		[0.054]	
$Elect_{t+1} \times Wide$		0.182***	
		[0.059]	
$Elect_{t-2} \times Term\ Limited$			-0.180***
			[0.058]
$Elect_{t-1} \times Term\ Limited$			-0.317***
			[0.058]
$Elect_t \times Term\ Limited$			-0.236***
			[0.060]
$Elect_{t+1} \times Term\ Limited$			-0.176***
			[0.063]
Bank-level controls	Yes	Yes	Yes
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	207,535	207,535	207,535
R^2	0.574	0.574	0.574

Table 10
Jumbo Loan Origination

This table reports estimation results of the baseline specification (specification (1)) using alternative measures of loan variables. The dependent variables are (1) log(1+Volume originated), where Volume originated is the volume of jumbo loans bank i originates in state s in quarter t, (2) log(1+Number originated), where Number originated is the number of such loans, and (3) Volume originated/lag(assets), the volume of such loans scaled by the bank's assets from a year ago. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. All control variables are lagged by a quarter. Note that only election quarter variables are reported. The specification includes bank×state fixed effects as well as state×time fixed effects. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1)	(2)	(3)
Variables	log(1+Volume originated)	log(1+Number originated)	Volume originated/lag(assets)
$Elect_{t-2}$	-0.079**	-0.031***	-0.010***
	[0.036]	[0.008]	[0.002]
$Elect_{t-1}$	-0.106***	-0.031***	-0.011***
	[0.036]	[0.008]	[0.002]
$Elect_t$	-0.110***	-0.041***	-0.007***
	[0.035]	[0.008]	[0.002]
$Elect_{t+1}$	-0.019	-0.017**	-0.010***
	[0.036]	[0.008]	[0.002]
Bank-level controls	Yes	Yes	Yes
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	207,535	207,535	206,544
R-squared	0.606	0.725	0.644

Table 11
Conforming Loans

This table estimates the baseline specification (specification (1)) using a sample of conforming loans. The dependent variables are (1) log(1+Volume held), where Volume held is the volume of conforming loans bank i either originates and holds or purchases and holds in state s in quarter t, (2) log(1+Number held), where Number held is the number of such loans, and (3) Volume held/lag(assets), the volume of such loans scaled by the bank's assets from a year ago. $Elect_{i,h,t+k}(k = -2,-1,0,1)$ are set to one if a bank i's home state h holds a gubernatorial election in quarter $t-k$, and zero otherwise. X is a set of time-varying bank-level control variables including size, home mortgages, core deposits, and return on equity. All control variables are lagged by a quarter. Note that only election quarter variables are reported. The specification includes bank×state fixed effects as well as state×time fixed effects. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1)	(2)	(3)
Variables	log(1 + Volume held)	log(1 + Number held)	Volume held/lag(assets)
$Elect_{t-2}$	-0.092***	-0.066***	-0.010***
	[0.022]	[0.008]	[0.001]
$Elect_{t-1}$	-0.113***	-0.065***	-0.012***
	[0.021]	[0.008]	[0.001]
$Elect_t$	-0.157***	-0.092***	-0.009***
	[0.023]	[0.009]	[0.001]
$Elect_{t+1}$	-0.123***	-0.067***	-0.011***
	[0.023]	[0.009]	[0.001]
Size	0.704***	0.458***	-0.051***
	[0.025]	[0.014]	[0.003]
Home mortgages	2.793***	1.636***	0.274***
	[0.130]	[0.072]	[0.018]
Core deposits	-0.155	-0.164**	0.088***
	[0.133]	[0.069]	[0.012]
Return on equity	0.542***	0.171*	-0.069***
	[0.204]	[0.097]	[0.022]
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	450,597	450,597	448,893
R^2	0.614	0.697	0.576

Table 12
Robustness Checks

This table reports various robustness test results. Column (1) repeats our baseline regression (column (1) of table 4) using pseudo-election dates where the election year is randomly selected for each state with a 4-year interval excluding the actual election year. Column (2) repeats our baseline regression excluding states which hold gubernatorial elections in the same year as presidential elections. Column (3) repeats the baseline specification excluding loans extended to three large states, California, New York, and Florida. The dependent variable is log(1+Volume held), where Volume held is the volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t. Only election quarter variables are reported to save space. Standard errors double clustered at the bank×state level are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% level, respectively. See Appendix for variable definitions.

	(1)	(2)	(3)
	Pseudo-election	Excluding states coinciding	Excluding
Variables	dates	with pres. elections	large states
$Elect_{t-2}$	0.025	-0.140**	-0.124***
	[0.030]	[0.064]	[0.037]
$Elect_{t-1}$	0.111***	-0.268***	-0.205***
	[0.029]	[0.061]	[0.035]
$Elect_t$	0.031	-0.313***	-0.227***
	[0.029]	[0.062]	[0.038]
$Elect_{t+1}$	0.010	-0.150**	-0.121***
	[0.029]	[0.067]	[0.038]
Bank-level controls	Yes	Yes	Yes
Bank-State Fixed Effects	Yes	Yes	Yes
State-Time Fixed Effects	Yes	Yes	Yes
Observations	207,535	170,536	184,842
R^2	0.574	0.570	0.565

Appendix: Variable Descriptions

Variable	Description
Dependent Variables	
Volume held$_{i,s,t}$	The volume of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t.
Number held$_{i,s,t}$	The number of jumbo loans bank i either originates and holds or purchases and holds in state s in quarter t.
Volume originated$_{i,s,t}$	The volume of jumbo loans bank i originates in state s in quarter t.
Number originated$_{i,s,t}$	The number of jumbo loans bank i originates in state s in quarter t.
Election Variables	
$Elect_{t+k}$	$Elect_{t+k}$ takes a value of one if a bank's home state holds a gubernatorial election in quarter $t-k$, and zero otherwise, where the quarter leading up to an election ($Elect_t$) is defined as the three-month period from September to November.
Close	An indicator variable set equal to one if the vote difference in an election is less than 5%, and zero otherwise, where vote difference is defined as the difference between the proportion of the votes garnered by the winner and that received by the runner-up.
Wide	An indicator variable set equal to one if the vote difference in an election is more than 15%, and zero otherwise
New governor	An indicator variable set to 1 if a new governor is elected in an election and zero if an incumbent is re-elected.
Term limited	*Term limited* is equal to one if an incumbent governor faces a binding term limit and cannot run for re-election, and zero otherwise.
Other Variables	
Size	The logarithm of a bank's total assets.
Home mortgages$_{i,t}$	The sum of first lien and junior lien residential real estate loans and home equity loans as a fraction of total assets.

(cont'd in the next page)

Variable	Description
Core deposits	The sum of transaction deposits, savings, and small time deposits divided by total assets.
Return on equity$_{i,t}$	Net income divided by average equity.
Z-score$_{i,t}$	$\frac{\overline{ROA}_{i,t} \times \frac{\textit{total equity}_{i,t}}{\textit{total assets}_{i,t}}}{sd(ROA_{i,t})}$, where $\overline{ROA}_{i,t}$, is a bank's return on assets averaged over 8 quarters between t and $t-7$. Similarly, $sd(ROA_{i,t})$ is standard deviation of a bank's return on assets calculated over 8 quarters between t and $t-7$.
Equity ratio$_{i,t}$	The ratio of total equity to total assets.
Credit risk$_{i,t}$	The ratio of risk-weighted assets to total assets.