Hub-and-Spoke Regulation and Bank Leverage

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Abstract

Hub-and-spoke regulation, where a central regulator with legal power over firms delegates monitoring to local supervisors, can improve information collection, but can also lead to agency problems and capture. We document that following the closure of a US bank regulator's field offices, the banks they previously supervised distribute cash, increase leverage, and increase their risk of failure, more than similar banks at the same time and place. The opposite occurs for openings. Our findings suggest that field level interaction is an important part of regulation, and that distancing supervisors from banks to prevent regulatory capture can increase bank risk.

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1 Introduction

Hub-and-spoke regulation features a central regulator with legal power over firms, which delegates monitoring to local supervisors. This decentralized regulatory structure can improve the monitoring of geographically dispersed firms (Laffont and Tirole, 1993). It is employed by many US and European regulators whose legal authority reaches across state lines. The hub-and-spoke regime can, however, also introduce agency problems when the objectives of local supervisors at the spokes differ from those of the central regulator at the hub (Carletti, Dell'Ariccia, and Marquez, 2015). We provide empirical evidence from banking to gauge this mostly theoretical tradeoff, and find that monitoring gains from local supervision outweigh any associated agency problems.

Our findings suggest that field level interaction is an important part of regulation, and that distancing supervisors from banks to prevent capture can be costly as it increases bank risk. The European Union is currently transitioning from a collection of autonomous local state regulators to a more centralized and uniform regulatory regime, in banking and in other markets (Carletti et al., 2015). US bank regulators are reducing the frequency of on-site examinations and plan to rely more on off-site monitoring. Such a transition is supported by previous empirical work that carefully documents that the same regulation can be interpreted or enforced inconsistently by different regulators (Agarwal, Lucca, Seru, and Trebbi, 2014), and that user fee-funded regulators are more lenient with higher fee paying firms (Kisin and Manela, 2014). While such agency problems are clearly present in a delegated regulatory regime, our findings suggest that caution is warranted to avoid the loss of accurate information from supervisors in the field.

We study nationally-chartered commercial banks in the US, which are primarily regulated by a hub-and-spoke agency called the Office of the Comptroller of the Currency (OCC). Headquartered in Washington, D.C., the OCC currently supervises about 1,200 midsize and community banks by delegating much of the day-to-day decision making authority to 66 field offices. Local supervisors have leeway in determining the amount of capital that is appropriate for a bank's risk, and often require commercial banks to maintain a higher level of capital than the minimum requirement set by the Federal Deposit Insurance Corporation Improvement Act (FDICIA). We observe ex-ante measures of risk, and many other bank characteristics from bank quarterly regulatory filings, as well as ex-post failures, providing a large panel spanning thirty years and thousands of banks.

Thus, the OCC provides an ideal setting to investigate the effect of supervisor proximity on bank regulatory outcomes, allowing us to assess the hub-and-spoke structure.

The study of the relation between supervisor proximity and bank risk poses significant identification challenges. The main challenge is that if supervisor proximity is indeed important, risk-loving banks that wish to avoid regulatory scrutiny may locate far from supervising field offices, and regulators could design their field office network to minimize the distance from regulated banks subject to their budgets (Macher, Mayo, and Nickerson, 2011). An estimate from an OLS regression of firm risk on supervisory proximity could be biased if unobserved heterogeneity in risk preference, for example, increases both distance and risk. We address this concern with a difference-in-difference empirical design that uses changes in the OCC field office structure to isolate plausibly exogenous variation in supervisory proximity.

We construct a novel dataset of OCC field office locations and years of operation, which reveals ample variation in field office proximity to supervised banks. From 1985 to 2014, the OCC opened 83 new field offices and closed 43 existing ones. The OCC establishes new offices, often as satellite offices to existing large offices, in areas that experience an increase in banking assets under supervision, and therefore an increase in regulatory fee revenue (and potentially supervising costs). One might expect this behavior from a resource constrained regulator aiming to "achieve maximum efficiency and cost effectiveness" (OCC, 1998; Eisenbach, Lucca, and Townsend, 2016). When these large offices start losing banking assets under supervision, the OCC consolidates the smaller neighboring offices, often the satellite offices, into the large offices. Thus, offices are closed when a large neighboring office loses banking assets under supervision over time and no longer needs the resources of a satellite office. We use these consolidations (office closures, henceforth) as a source of variation for banks' proximity to their nearest supervisor.

Our main finding is that following the closure of OCC field offices, the banks they previously supervised distribute cash to their shareholders, increase their leverage, and increase their likelihood of failure, more than similar banks at the same time and place. We find no change in charge-offs or provisions for loan losses, which could mechanically increase leverage due to a deterioration of a bank's loan portfolio. Instead, our findings are consistent with a deliberate choice by affected banks to increase their leverage. Specifically our estimates show that banks whose supervising office closes increase leverage by 2% more than similar control banks. The opposite occurs for office openings.

While leverage increases immediately after closure and remains elevated for three years, a delayed consequence of higher risk in the form of a higher failure probability appears approximately two years after closure. In all cases, treated banks are statistically indistinguishable from untreated banks before the closure.

We find that supervisor proximity is a channel through which these effects operate. Specifically, the effects of office closure are stronger when the corresponding increase in physical distance and driving time between banks and their supervisory offices are larger. We note, however, that supervisor proximity may not be the only channel. For example, the mere act of reassigning bank supervisors upon office consolidation may also affect bank monitoring.[1] Moreover, because the variation we exploit involves the distance between field offices and the relatively small banks they supervise, it is plausible that the distance between supervisors and larger banks may be more or less important than we estimate.[2]

A natural question given the advances in information technology experienced over the last few decades, is whether the importance of supervisor proximity has diminished over time. The literature studying the importance of proximity between firms and individuals in markets has documented that the proximity of banks to their borrowers and the proximity of firm headquarters to their plants has become less important (e.g. Petersen and Rajan, 2002; Giroud, 2013).[3] In contrast, we find that treatment effects are similar in magnitude and statistical significance in the early and latter halves of our sample (before and after the year 2000). Advances in information technology, which reduce information asymmetry between banks and field offices, may have simultaneously reduced information asymmetries between the regulatory hub (the OCC headquarters) and spokes (supervisors in the field). With such two-sided moral hazard (Dybvig and Lutz, 1993; Bhattacharyya and Lafontaine, 1995), the effect of distancing supervisors from banks can increase bank risk, even with information technology advancements.[4]

[1] Loan officer rotation has been shown to affect moral hazard within firms (Hertzberg, Liberti, and Paravisini, 2010; Fisman, Paravisini, and Vig, forthcoming).

[2] We know of no variation in the distance to the largest banks, whose supervisors are permanently located at their headquarters. Future work may find ways to gauge the external validity of our estimates to the largest banks.

[3] Evidence of the proximity channel has been documented in the context of relationship lending (Berger, Saunders, Scalise, and Udell, 1998; Strahan and Weston, 1998; Berger and DeYoung, 2001; Petersen and Rajan, 2002), the home bias in portfolio choice (Coval and Moskowitz, 1999), and the internal capital markets of geographically dispersed firms (Giroud, 2013; Giroud and Mueller, 2015). Nguyen (2016) finds that even in the 2000s, bank branch closings lead to a decline in local small business lending, but not in credit products that require less soft information like mortgages.

[4] In other words, our estimates measure the difference between the two aspects of moral hazard, and if advances

An important remaining concern is that field office locations could change because of differing trends in local economic conditions. For example, an increase in local banking market competition can adversely affect bank profitability and may result in both an increase in bank leverage and a reduced demand for supervision that leads to office closure. We address this concern in three different ways.

First, our rich dataset allows us to estimate a treatment effect of office closure controlling for many forms of unobserved time-varying heterogeneity, by including county-by-quarter and office-by-quarter fixed effects. These estimates are identified by comparing the differential response of banks supervised by the same current office, which are located in the same county at the same time (and hence subject to similar economic conditions), but when only some of these banks were previously supervised by a closed office. We can obtain such estimates even after including county-by-quarter and office-by-quarter fixed effects because 211 banks are reassigned to neighboring offices following 26 closures when other banks in the same county are not reassigned. This more local average treatment effect of closure on leverage is of greater magnitude than our benchmark estimates and highly significant. Thus, any time-varying unobservable heterogeneity at the office or county level, that may coincide with both office closure and bank risk, does not explain our findings.

Second, we show that state-chartered banks (not regulated by OCC) located at the same place and time as the treated banks are not affected by OCC office closures. If local economic conditions affect both office closures and higher bank leverage, one would expect that state-chartered banks located in the same region would also be affected by these conditions. Finally, we find similar results for a subsample of treated nationally-chartered banks which we can match to a similar state-chartered bank located in the same zip code. This analysis compares treated banks to similar untreated banks located in the same zip code at the same time.

Our paper contributes to the literature studying the economics of regulation. To the best of our knowledge, ours is the first paper to provide evidence on the effect of regulator proximity on firm risk and document the importance of local supervision in the hub-and-spoke regulatory structure. Lim, Hagendorff, and Armitage (2016) use OCC office locations from 2004 to 2013 to study the accounting quality of bank financial reporting. Wilson and Veuger (2016) find that cross-sectional variation in bank proximity to OCC field offices and state banking agencies increases the banks'

in information technology affect both sides similarly, the difference may continue to remain significant.

administrative costs. We differ from these studies in our focus on bank risk, and in our ability to control for many forms of unobserved heterogeneity that may be correlated with supervisor proximity due to our richer field office data.

In the context of financial regulation, our work relates to Kroszner and Strahan (1996), who show that during the S&L crisis in the 1980s, regulators kept insolvent thrifts alive by influencing the allocation of private capital. Kroszner and Strahan (1999) find that pressure from interest groups affected the implementation of interstate branching deregulation. Agarwal et al. (2014) exploit exogenous rotations between federal and state supervisors of state-chartered banks to show inconsistency in regulatory outcomes. Kisin and Manela (2014) show that user fee-funded regulators are more lenient with higher fee paying firms. They argue that the large effects they find are consistent with dispersed local supervisors who care about their own fee revenues and budgets.[5] We contribute to this literature by documenting the importance of local supervision to regulating bank risk.

The paper proceeds as follows. Section 2 describes banking regulation in the United States, the role and organization of OCC, and our data on field offices. Section 3 explains why office closures are plausibly exogenous to treated bank characteristics. Section 4 reports our empirical results. Section 5 examines their robustness. Section 6 concludes.

2 Institutional Background and Data

2.1 Institutional Background

We focus on nationally-chartered US commercial banks whose primary regulator is the OCC. These banks interact solely with one safety and soundness regulator, unlike state-chartered banks, which interact with a federal banking regulator (the FDIC or the Fed) as well as the state banking regulator of the state that the institution is headquartered in.[6] As a result, proximity to the closest regulator does not depend upon the rotation between federal and state regulator (Agarwal et al.,

[5] See also Barth, Caprio, and Levine (2004), Lucca, Seru, and Trebbi (2014) and Shive and Forster (2013) on the "revolving door" between regulatory agencies and the industry, and Lambert (2015) on lobbying and regulatory outcomes. Hirtle and Lopez (1999) study the time decay of bank examinations. Rose (2014) is a recent survey.

[6] However, the Federal Reserve System supervises banks' holding companies. We explore how this may affect our results in Section 4.6

2014).[7]

To achieve its goal of ensuring the safety and soundness of US national banks, the OCC uses a system of semi-autonomous districts and field offices spread out across the country to supervise midsize and community banks. These field offices are used as a means to disperse regulatory personnel in close proximity to the institutions that they supervise. In this sense, field offices act as the most localized regulatory presence. These offices carry out the day-to-day functions that entail safety and soundness supervision. In addition to being the "boots on the ground" presence that facilitate regulatory objectives, these offices and their staff are usually bankers' first point of contact with their regulators (OCC, 2015).

The OCC's geographical structure has changed as it responded to changes in regulation and the banking industry. For instance, in 2002, it merged its field operations in two districts and consolidated the reporting structure over the banks supervised in these two regions. In its documents, the OCC stated that its overarching goal was to respond to advances in technology to operate more efficiently (OCC, 2002). Figure 1 shows the current system of OCC offices that includes four districts and about 70 field offices.

2.2 Data

We construct a novel dataset of OCC field office locations from 1985 to 2014. We hand collect this information from archived OCC telephone directories, which list OCC district and field office locations going back to the early 1980s. These directories were published approximately annually throughout the course of our sample until 2010. For the 2010–2014 period, we follow Lim et al. (2016) and use website archiving services (such as *WayBackMachine* provided by archive.org) to collect historical field office locations from cached versions of the OCC website.

The telephone directories allow us to identify time-series variation in the geographical dispersion of OCC field offices. They include detailed information on geographical location of field offices such

[7]Three federal regulatory agencies share the responsibilities of supervising and regulating commercial banks in the United States: The Federal Reserve System (Fed), The Federal Deposit Insurance Corporation (FDIC), and the Office of the Comptroller of the Currency (OCC). Each regulator carries with it specific mandates on which type of institutions it supervises and achieves its regulatory objectives by combining off-site monitoring with on-site inspections. For instance, the Federal Reserve is mandated with supervising bank holding companies (BHCs) as well as state-chartered banks which elect to be part of the Federal Reserve System. The FDIC supervises state-chartered banks that do not elect to be part of the Federal Reserve System, and the OCC supervises national banks. While their individual mandates and responsibilities may vary, their common overarching goal is to ensure the safety and soundness of the banking system.

as city, state, street address and zip-code for the time these directories were published. Importantly, these directories distinguish between field office locations within a given metropolitan area. For instance, the OCC had field offices in Fairview Heights, IL and St. Louis, MO, both in the same metropolitan area separated by 15 miles.[8]

Using these telephone directories, we carefully track which cities hosted OCC field offices from the 1980s up until the end of our sample in 2014. We classify a field office closure as an office that appears on one of these directories for a particular year and drops out in the subsequent telephone directory publication. Conversely, we classify field office openings as offices that appear in telephone directories which were not there in the previous directory. We do not classify the change of address of an office within the same city as either closing or opening. Following this approach, we end up with 43 field office closures and 83 openings spread across 30 years between 1985 and 2014. On average, the OCC has 70.5 offices in any given year during our sample period.

Table 1 shows the time series of field office location changes throughout our sample period. With the exception of a concentration of openings in 1990, these changes are fairly dispersed over time. We have not been able to find an official document from the OCC explaining this large change in 1990 but our conjecture is that the S&L crisis in the late 1980s might have prompted this change in the supervisory structure. However, this change does not affect our results because we primarily focus on office closures.

Figure 2 provides a geographic summary of field office openings and closings throughout our sample. We find that field office openings and closings are also geographically dispersed. Unlike other federal banking regulators, such as the Federal Reserve, OCC field offices are located in more rural cities. This may reflect the fact that they do not share regulatory oversight with state banking agencies and therefore require more offices than the Federal Reserve or the FDIC.

We assume that each bank is supervised by the geographically closest field office.[9] In order to assign banks to their nearest field offices, we calculate the distance (in miles) between each commercial bank's headquarters and the nearest OCC field office.[10] We gather zip codes for bank

[8]While we account for different offices located in different cities within a metropolitan area, we make some simplifying assumptions when accounting for multiple field offices *within* the same city in a particular metropolitan area (i.e., multiple offices within Fairview Heights, IL). These details are expanded upon in subsequent sections.

[9]We confirmed the validity of this assumption in conversations with the assistant deputy comptrollers in charge of several field offices.

[10]Supervision most likely happens at bank headquarters as opposed to branches.

headquarters from the Consolidated Reports of Condition and Income (i.e., Call Reports) and for field offices from the OCC telephone directories and use the Geocoder provided by Texas A&M University to geocode these locations.[11] We then assign banks to the field office nearest to their headquarters and calculate the distance between bank headquarters and the nearest OCC field office at time t. Our main explanatory variable, *Closure*, is an indicator variable that is one for bank i in quarters t to $t + 20$, if the nearest office to bank i closed at time t, and zero otherwise.

Call reports and Research Information Systems (RIS) data are from the Federal Financial Institutions Examination Council (FFIEC) and the FDIC, respectively. Our dependent variables are segmented into three main categories: leverage, loan performance, and changes in equity. In addition, we also examine bank failures and regulatory enforcement actions. We use firm- and person- specific enforcement actions on bankers and financial institutions (Kisin and Manela, 2014).

Capital ratios are widely used to measure banks' safety and soundness. While different ratios are calculated slightly differently from one another, all ratios essentially capture the proportion of bank equity to total assets. Thus, as capital ratios increase, banks are less likely to default on debt or enter FDIC receivership. During the process of supervision, through on-site examination and off-site monitoring, regulators evaluate the appropriateness of banks' leverage ratios based upon their risk. While regulations such as FDICIA or Basel guidelines stipulate minimum quantitative thresholds on what constitutes "adequately capitalized", local regulators retain a considerable amount of leeway in ascertaining the appropriate level of equity (Agarwal et al., 2014; Kisin and Manela, 2014).

Bank loan performance ratios capture banks' loan quality. Regulators evaluate banks' asset quality by measuring non-current loans: the proportion of loans that are delinquent or not accruing interest. Increases in such measures may eventually lead to greater problems which require greater regulatory intervention (OCC, 2001). Relatedly, net charged-offs measure the amount of loans that banks believe are uncollectable and therefore realize them as losses.

Loan loss provisions rely heavily on bank discretion. Through their provisioning behavior, banks expense income in order to plan for impending loan losses. In contrast, banks can also use loan loss provisions to smooth income by shifting income from prosperous times to downturns. Thus, while greater provisions, unconditionally, may help banks weather downturns more effectively, bank regulators and auditors scrutinize the level of provisions so that it tracks banks' expected credit

[11] https://geoservices.tamu.edu/

losses.

We also examine changes in payout policy after supervisor proximity changes. Banks, like any other corporate entity, have the ability to disburse proceeds from operations back to shareholders. However, bank regulators impose unique restrictions on banks' ability to pay dividends that do not exist for non-financial firms.

We present summary statistics in Table 2. On average, the banks in our sample are small (mean assets of $280 million), profitable (mean ROA of 0.4 percent), and well capitalized (mean Tier 1 core capital ratio of 9.8 percent).[12] While enforcement actions are rare, bank failures occur fairly often. Since our sample covers several recessions and banking crises, we witness 644 failures of nationally-chartered commercial banks, or roughly 10 percent of the unique nationally-chartered banks in our panel dataset.

3 Empirical Methodology

To investigate the potential impact of hub-and-spoke regulation on bank leverage, we use OCC office closures as a source of variation for banks' proximity to their nearest supervisor. In this section, we discuss OCC office closures, and our empirical methodology that leverages these office closures and argues that they are plausibly exogenous to treated bank characteristics.

3.1 Office Openings and Closings

3.1.1 Office Openings

Understanding why the OCC opens and closes offices is central to our use of office closures as a source of variation to supervisor proximity. The organizational structure of the OCC is such that field offices are generally located in areas close to higher bank activity, which aids in reducing burdens associated with frequent on-site visits and regular interactions between OCC personnel and bank managers.[13]

[12] There are fewer observations for risk-based capital ratios because they were implemented by regulators in the mid-1990s.

[13] We find anecdotal evidence consistent with OCC field offices playing a central role in facilitating information. During the financial crisis, assistant deputy comptrollers (ADCs) increased their on-site visits of community nationally-chartered commercial banks in order keep bankers abreast of regulators' supervisory expectations (OCC, 2008).

In order to facilitate greater supervisory communication, the OCC *opens* offices in areas that experience general growth in banking activity. To demonstrate this point, we examine the relation between likelihood of office openings and the number of banks (and assets) supervised, as well as the supervisory fees generated by incumbent OCC field offices located in the vicinity of yet-to-open field offices. Figure 3 illustrates average trends in assets supervised, banks supervised, as well as supervisory fees.

Neighboring offices supervise from 120 to up to 150 banks in the years prior to OCC office openings. This supervisory load is much larger than the load on an average OCC office, which supervises approximately 41 commercial banks. The number of assets supervised increases by more than 50 percent in the year preceding OCC office openings indicating an increase in banking activity. Likewise, the supervisory fees collected by the OCC in the years preceding field office openings increases by nearly 16 percent during this time. These facts collectively suggest that banks supervised by neighboring offices grew rapidly, necessitating the opening of new field offices to alleviate supervisory burden at incumbent field offices.

3.1.2 Office Closings

While extending the argument to field office closings would mean that the OCC closes offices in areas of low banking growth, our data paint a different picture. Closings tend to occur when the OCC consolidates operations between relatively larger and smaller field offices. When large offices start to lose banking assets under supervision, the OCC closes a smaller, neighboring office and consolidates that office with the neighboring, large office. This consolidation may occur for several reasons. First, many of these consolidations occur between a field office and its satellite office. Satellite offices allow the OCC to respond quickly to industry trends and share a common ADC with an existing, nearby field office.[14] Second, we posit that the area which is losing banking assets may need more supervision. As a result, the OCC may consolidate two offices to bring more resources to this region.

Figure 4 illustrates two important points by comparing the trend in the number of banks and

[14] ADCs are the senior-most examiner in charge of a field office. Some offices have multiple assistant comptrollers who may have equal oversight responsibilities. In our data collection process, we find anecdotal evidence which supports the argument that OCC office closures occur in the form of large offices consolidating with neighboring, smaller ones.

assets supervised along with supervisory fees collected by the closed and neighboring offices in the years before office closures. First, panels (c) through (f) suggest that neighboring offices are three times larger than closed offices in terms of banking assets supervised, as well as fees collected by these offices. Second, the banking assets under the closed office remained relatively constant, while the assets under the neighboring office significantly declined during the years immediately preceding office closure.

In Table 3, we formally test this trend by employing a likelihood regression framework. We regress an indicator variable that takes a value of one during the quarters that an office closes on different office-level characteristics for the closed and neighboring offices. Columns (1) through (3) report OLS estimates of linear probability models, while columns (4) through (6) report logit regression estimates.

The evidence suggest that the characteristics of the closed offices are not associated with its closure. By contrast, regression results from columns (2) and (5) show the characteristics of neighboring OCC field offices (specifically the number of banks under supervision, number of assets supervised, and supervisory fees collected) are significantly associated with the closure of OCC field offices. We find similar results in the specifications where we include characteristics of both the closed and neighboring offices. These results suggest that office closures occur when larger, neighboring offices lose banking assets under supervision.

3.2 Empirical Specification

In light of the above discussion, office closures provide variations to hub-and-spoke structure that are plausibly exogenous to treated bank characteristics. We use office closures in a difference-in-differences framework to investigate the effect of hub-and-spoke supervision on bank capital and behavior. In particular, we use the following specification:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it} \tag{1}$$

where the subscript i indicates bank, t indicates year-quarter and o indicates OCC field office regulating bank i. The main independent variable is the indicator variable, $Closure$, that takes a value of 1 for bank i during 20 quarters following closure of office o regulating bank i and 0

otherwise. We define *Closure* in this manner because many banks in our sample are treated more than once and we want to capture all these treatments in our specification.[15] Our main dependent variables include bank capital ratios, equity components including dividends, net equity issuance and net chargeoffs, bank failure and non-current loans (NCL). . X_{it} is the control variable that represents number of quarters that bank i has been regulated by office o. We include this control to rule out the effect of reassignment of supervisors which may drive our results. For instance, offices may be more lenient on banks when they first start regulating them because they may not understand the workings of that particular bank immediately, and may take some time to gauge the optimal amount of capital requirement.

Inclusion of bank fixed effects (α_i) ensures that the regression is estimated for changes within the bank and coefficients are not biased due to heterogeneity across banks. We include year-quarter fixed effects (α_t) to control for time trends. Further, we include office fixed effects (α_o) to control for time invariant heterogeneity across offices that may bias our estimates. For instance, banks that were regulated by an office that closed get distributed to neighboring offices following closure. If these offices are inherently more lenient than the closed office, it may bias our estimates. Following Gormley and Matsa (2014, forthcoming), we do not include endogenous bank level controls. However, in unreported tests we find that our estimates are robust to controlling for bank size and ROA.

The identifying assumption is parallel trends, i.e. absent office closures, the trend in dependent variables for both treated and control banks would have been the same. We provide evidence supporting this assumption in terms of absence of pre-trends for different outcome variables. Further, we show that our results are robust to using a matched sample. To accomplish this, we employ a Mahalanobis matching (i.e., nearest neighbor) technique to find upto three nationally chartered control banks for every treated bank that is closest in terms of size, ROA and capital ratio in the year before treatment, i.e. office closure. Our difference-in-differences coefficient compares the change in the dependent variable for treated banks between the five years after office closure and five years before closure to the same change in control banks.

Table 4 compares treated and control banks along various dimensions during the quarter before

[15] In unreported tests, we find that our results are robust to defining *Closure* as an indicator variable that takes a value of 1 for all quarters following closure of it's regulating office.

treatment. We find that these banks were similar along most dimensions in the quarter before treatment. However, treated banks have lower non-current loans and net charge-offs, and provision less.

A potential concern with the above specification is that the banking industry environment may be changing even for treated banks. If neighboring offices are losing banking assets before closure, this may also affect banks supervised by closed office as these banks are geographically close and may be affected by changes in the banking competition environment in the region. To address this concern we estimate the following model that includes multi-dimensional fixed effects to control for local economic conditions and unobserved changes at the office level:

$$y_{it} = \alpha_i + \alpha_{ct} + \alpha_{ot} + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it} \tag{2}$$

where subscripts and variables have the same meaning as in equation (1) with the exception of the county-by-year-quarter fixed effects (α_{ct}) for the county c where bank i is headquartered and the office-by-year-quarter fixed effects (α_{ot}) for the office o that supervises bank i.[16]

The inclusion of office-by-year-quarter and county-by-year-quarter fixed effects ensures that our difference-in-differences estimates are robust to many types of unobservable omitted variables that could otherwise confound our analysis. We are able to obtain estimates for the effect of office closures even after including office-by-year-quarter fixed effects because banks get assigned to neighboring offices following treatment. Our estimates are identified by comparing the differential response of two banks that are located in the same county at the same time but when only one of these was supervised by a closed office in the earlier period. Thus, any unobserved time-varying geographical factors, such as changing bank competition, that could coincide with the closure of an office and affect our outcome of interest do not bias our findings. The inclusion of office-by-quarter fixed effects further controls for time-varying unobservable heterogeneity at the office-level, and for any office level factors that may lead to closures and may simultaneously affect bank risk.

[16]It is important to note that office×year-quarter fixed effects are not collinear with the *Closure* variable. This is because following the closure of an office, all banks regulated by that office are regulated by other offices. Thus the office for treated banks changes following treatment allowing us to include these fixed effects.

4 Main Results

In this section, we describe our main results on the effect of hub-and-spoke regulation on bank capital and failure.

4.1 The Effect of Office Closures on Bank Leverage

We begin by discussing our results for bank capital. Table 5 reports results for regressions of the type described in equation (1) with different dependent variables capturing bank capital. We use four different ratios used to measure bank capital - three regulatory capital ratios and the ratio of book-equity to total assets. US banks are required to report three capital ratios to their regulator: tier 1 (core) capital over average total assets, tier 1 capital over risk-weighted assets and total risk-based capital over risk-weighted assets. The non-risk based ratio (i.e. tier 1 capital over average total assets) is available from the beginning of our sample while the other two risk-based ratios were introduced later during the mid 1990s and are only available for that sub-sample. To complement these regulatory capital ratios, we also use the ratio of book-equity to total assets because it is available for our entire sample period. The first four columns in Table 5 report treatment effects of office closures on capital ratios estimated for the entire sample of banks while the last four columns report the coefficients estimated for the matched sample.

The coefficient reported in column (1) shows that banks increase leverage following office closure. The change in tier 1 capital to total assets ratio for the treated banks between 5 years following office closures and the period before closure is 2.8% lower than the similar change for the control banks. We find similar results with the matched sample reported in column (5) as well as for the other three variables estimated with both the entire and matched sample.

Figure 5 plots the dynamics for the same regressions by interacting the closure indicator with the time in quarters relative to the closure. Panel (a) plots these dynamics for tier 1 capital to total assets ratio. The coefficients in the quarters before office closures are not statistically significant showing that trends in bank leverage were similar for both treated and control banks in the pre period. Importantly, the coefficients decline significantly starting from the quarter of office closure. This evidence shows that differences in tier 1 capital to total assets ratio for treated banks is significantly lower than for control banks. Further, the plot shows that this effect is long-lasting

and significant for more than 3 years following closure. Panel (b) plots similar coefficients for the book-equity to total assets ratio. We find similar results that are statistically and economically significant for over 3 years following closure.

These effects on bank leverage are potentially surprising because, even with delegated supervision, OCC headquarters can observe reported bank capital ratios. Headquarters, however, may find it harder to assess from a distance whether a reported level of capital is appropriate given the specific risk profile of each bank. Both the riskiness of assets and their mismatch with liabilities may not be fully captured by the reported accounting measures. Indeed, a large literature documents that banks avoid capital regulation by exploiting weaknesses of risk-weighting rules, shifting activities into softer regulatory environments, and using loopholes.[17] Given the imperfections of reported risk measures, our findings suggest that local and perhaps more nuanced supervision plays an important role in bank regulation.

4.2 How Do Banks Increase Leverage?

Bank leverage may increase for several reasons. It may increase as a consequence of bank experiencing losses, banks' greater risk-taking incentives, or it may increase if banks provision more for losses. To understand the mechanism underlying the increase in leverage, we investigate various components of equity. First, we investigate the effect of office closures on bank equity issuance. If banks voluntarily want to increase risk, distributing dividends or repurchasing equity may be a direct way to increase leverage. Column (1) in Table 6 reports the effect of office closures on dividends. We find that the change in dividends issued by treated banks during the five years following closure is 10 percent higher than the change for control banks relative to the sample mean. This suggests that banks actively distribute more dividends in the years following closure of their supervising office. This result is robust to using a matched sample. The estimates reported in columns (2) and (6) suggest that the change in net equity issuance is statistically similar between treated and control banks following office closures.

Next, we investigate if leverage increases as a consequence of banks losing money. We find

[17] See, e.g., Kane (1981; 2012), Basel Committee on Banking Supervision (2009), Hellwig (2010), Demirguc-Kunt, Detragiache, and Merrouche (2013), Houston, Lin, and Ma (2012), (Harris, Opp, and Opp, 2014), Duchin and Sosyura (2014), Karolyi and Taboada (2014), and Kisin and Manela (2016). Duchin, Gilbert, Harford, and Hrdlicka (forthcoming) show that even corporate "cash holding" is often risky securities.

that net chargeoffs are not statistically different between treated and control banks suggesting that treated banks are not losing more money than the control banks. Further, the coefficients reported in columns (4) and (8) suggest that the trends in provisioning for future loses is not statistically different between treated and control banks during the quarters following office closures.

Overall these results suggest that banks are actively increasing leverage by distributing more dividends and this increase in leverage is not a consequence of banks experiencing losses.

4.3 Delayed Consequences of Higher Risk

We next focus on investigating the consequences of higher risk. Higher leverage may not necessarily be bad for banks. In fact if banks earn higher profits and remain stable following an increase in leverage, it may be judicial for them to take on more risk. We investigate whether banks judicially increase leverage or if they lose money on loans and subsequently failifollowing office closures. Table 7 reports coefficients for the regressions that estimate the effect of office closures on bank failure and non-current loans. We find that treated banks are more likely to fail following office closures. In particular, the estimates reported in columns (1) and (4) suggests that the difference in likelihood of failure for treated banks between 5 years following office closure and period before closure is 40 percent higher than the same difference for control banks relative to the sample mean. Panel (a) of Figure 6 plots the dynamics of this effect. The coefficients before office closures are insignificant suggesting that the trends in the likelihood of failure were similar for both treated and control banks during the quarters before office closure. Importantly, the plot suggests that the increase in likelihood of failure occurs around 2-3 years following office closure. If banks take on more risks following office closure, the consequences of this higher risk-taking should take some timeto manifest in the form of higher failure rate. The results are consistent with this argument.

Next, we look at the effect of field office closures on enforcement actions. Columns (2) and (4) report estimates for this regression which suggest that the trend in enforcement actions is not statistically different between treated and control banks. Finally, we investigate the effect office closures on NCL . The static coefficients in columns (3) and (6) suggest that trends in non-current loans are not statistically different between treated and control banks. However, the plot of dynamic coefficients in panel (b) of Figure 6 suggests that non-current loans for treated banks increases more than control banks around 2-3 years following office closures relative to the period before closure.

Similar to the effect on failures, one would expect the non-current loans to increase only 2-3 years after banks start issuing riskier loans.

Overall these results suggest that the increase in leverage following office closures might not be judicial for banks as it leads to higher failure rate 2-3 years following office closures.

4.4 Supervisor Proximity as the Channel

After controlling for heterogeneity across offices and the number of quarters an office has regulated a particular bank, office closure likely affects bank policies through its effect on supervisory proximity. Proximity to the regulator/supervisor can affect regulatory outcomes owing to a couple of reasons. First, physical proximity can affect information asymmetry between the bank and regulator. Being close to the bank allows the regulator to gather more soft information which might not be accessible from a greater distance. Consistent with this argument, Lim et al. (2016), Wilson and Veuger (2016), Giroud (2013), and Kedia and Rajgopal (2011) use distance as a proxy for information asymmetry. Second, an increase in distance may also increase the cost of regulation (Kedia and Rajgopal, 2011) resulting in a regulatory oversight.

To establish supervisory proximity as a channel for the effect of office closures on bank leverage, we estimate regressions of the following form:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \theta Closure_{it} \times \%\Delta Proximity_{it} + \gamma X_{it} + \varepsilon_{it}$$

where subscripts and variables are the same as defined in equation (1) and $Proximity_{it}$ is the supervisory proximity, measured as either physical distance or driving time, from bank i to the closest OCC office at time t.

Table 8 reports results for these triple difference regressions that estimate the heterogeneity of the effect of office closures on bank leverage based on supervisory proximity. Panel A reports results where proximity is measured by driving time. The intuition for using driving time lies in the fact that physical distance may be more important in some areas than other. For example, 30 miles in a metropolitan area may pose a higher friction than the same distance in a country region. We find that the effect of office closure on bank leverage is increasing with the percentage change in driving time to the supervisor owing to office closures. The coefficients suggest that 1% increase in

driving time is associated with an increase of 4.44% in the effect of office closure on bank leverage.

Panel B of Table 8 reports results where supervisory proximity is measured by physical distance between the bank and its supervisory office instead of driving time. The triple difference estimate in column (1), though insignificant, suggests that the effect of office closure on bank leverage is increasing with the percentage change in distance to the supervisor owing to office closure. As discussed earlier, supervisory proximity is unlikely to change for large banks owing to office closures as most of these banks have in house presence of regulators. To account for this, we estimate our regression for banks with total assets below $10 billion and $1 billion in columns (2) and (3) respectively. We find that the triple difference coefficient becomes stronger and statistically significant for these cases, thus providing support to our claim of supervisory proximity as the channel of the effect. We find similar results in columns (4) through (6) where we use a second definition of bank leverage.

4.5 Information Technology and Regulatory Proximity

Advances in information technology have also changed important aspects of banking supervision and regulation. For instance, in 2002, the OCC restructured their district offices so that they can anticipate and respond to advances in information technology which may increase the efficiency of their supervisory processes (OCC, 2002).[18] In the context of our study, advances in information technology might mitigate the effects of changes to proximity that we document.

In Table 9, we present results similar to Table 5 after splitting our sample in half: from 1985 to 1999 and from 2000 to 2014. Like before, we include bank, quarter, and office fixed effects to control for unobserved heterogeneity. Given the shorter time series for risk-based capital ratios, we focus solely on the tier 1 leverage ratio and the book-equity to total assets ratio. We find that our results are strong across both subsamples, contrary to the story of information technology acting as a substitute for regulatory proximity.

Figure 7 presents time trends in the effect of office closures on bank capital. The consistent estimates suggest that the effect is fairly homogenous across our sample period. These results suggest that even with advances in technology, changes in field office location have considerable

[18] Anecdotally, our conversations with examiners revealed that banks can share confidential documents electronically that might have been only available in hard copies before.

effects on banks' propensity to increase risk.

One explanation to the stability of our treatment estimates is that our setting features two-sided moral hazard or hidden action (Dybvig and Lutz, 1993; Bhattacharyya and Lafontaine, 1995). Risk-taking by banks is not perfectly observable to supervisors in the field. On the other side, monitoring efforts by supervisors may be hidden from the regulator's headquarters. Advances in information technology, which may allow for greater distances between banks and supervisors, may have simultaneously reduced information asymmetries between OCC headquarters and supervisors in the field. With such two-sided moral hazard, even today, we find that the net effect of distancing supervisors from banks is an increase in bank risk.

4.6 Multiple Regulators

As mentioned, the OCC is the primary regulator of nationally-chartered commercial banks, but when these banks belong to a bank holding company, they are also regulated by the Fed. Because a closure of OCC field offices does not affect the proximity of Fed supervisors, we expect its effect on bank leverage to be smaller for banks that are also subject to Fed supervision.

Table 10 shows that, consistent with this reasoning, the treatment effect of field office closure on stand-alone banks' capital is almost twice as large as the effect on banks that belong to a single-bank holding company. The effect disappears for banks that belong to a multi-bank holding company.

4.7 Large Bank Supervision

The physical proximity of supervisors to large firms in particular has been criticized for introducing conflicts of interest among regulators (Stigler, 1971; Peltzman, 1976). *The Secret Recordings of Carmen Segarra* by This American Life and ProPublica, September 26, 2014, is a recent example that raised questions about whether the New York Fed was captured by Goldman Sachs, a bank which it supervised.

Supervisory teams assigned to about 40 large banks and some midsize banks with over $10 billion in assets are, however, located on the institution's premises. Table 10 shows that the effects of field office closure that we identify are concentrated among community banks with up to $1 billion in assets. While community banks are by far the majority by number, whether or not our estimates

of the importance of supervisor proximity apply to the few very large banks in the economy remains an open question left for future research. However, the fact that supervisors choose to maintain an on-site presence suggests that supervisor proximity is important for the largest banks as well.

5 Robustness

We discuss robustness tests that help alleviate potential concerns regarding our main results.

5.1 Office Openings and Bank Leverage

In Table 11, we report results which examine the relation between field office openings and bank leverage. In our previous tests, we focus almost exclusively on negative changes to proximity (i.e., increases in distance between field offices and banks). If negative changes to proximity increase bank leverage, then one would expect that positive changes to proximity should have an opposite effect and decrease leverage. We report the effect of field office opening on four measures of bank leverage as used previously in Table 5 and include bank, quarter, and office fixed effects to control for unobserved heterogeneity at these levels. As before, data for the tier 1 leverage ratio and the book-equity to total assets ratio are available for the entirety of our sample, while ratios utilizing risk-weighted assets are only available for roughly two-thirds of our sample.

We find consistent results with office openings that support our main results. Specifically, estimates reported in columns (1) and (2) shows that field office openings are associated with decreases in leverage. Economically, the result in column (1) suggest that treated banks have 1.8 percent lower leverage relative to untreated banks in the 20 quarters subsequent to field office openings. This effect is larger for book-equity to total assets, reflecting a broader definition of equity.

5.2 Controlling for Economic Conditions and Office Level Changes

As discussed in Section 3.2, local banking environment and economic shocks may affect our estimates. For instance, the treated banks may get affected by changes in banking industry occurring near the neighboring offices before closure.

We control for such trends by estimating the model described in (2). This specification includes

office-by-quarter and county-by-quarter fixed effects. These fixed effects control for time-varying trends at the field office and county level. In other words, inclusion of county-by-quarter fixed effectsensures that our estimates are identified by comparing two banks located within the same county (thus are subject to similar economic conditions) when only one of them was supervised by the closed office. Further, the inclusion of office-by-quarter fixed effects control for office level changes that may affect bank leverage and coincide with office closures.

Our results in Table 12 show that even after controlling for such unobserved, time-varying changes in local economic conditions, the effects that we document persist. In fact, our results in columns (1) through (4) are larger in magnitude than documented in Table 5. In examining the magnitude of the coefficients, we find that treated banks increase leverage, roughly on average, 9.6 percent relative to banks that are not treated. Moreover, these effects persist in columns (5) and (8) which estimates the treatment effect for a matched sample by comparing observationally similar banks. .

Panel B and C of Table 12 report results for the effect on office closure on equity components and failure. Consistent with our baseline results, we find that banks distribute more dividends and are more likely to fail following closure of their supervisory office.

5.3 Placebo Test: State-chartered Banks

Next, we examine the effect of OCC office closures on state-chartered banks. A potential concern, after controlling for office and county level time-varying trends in section 5.2, may be that trends in economic conditions in different regions within a county or office may be correlated with office closures and may bias our results. To address this concern, we examine the effect of OCC office closures on the state-chartered banks located in the same zip-code at the same time as our treated banks. If our results are indeed driven by trends in economic conditions not being controlled for in Section 5.2, we expect to find similar results of OCC office closures on state-chartered banks as we found for nationally chartered banks. On the other hand, if our results capture the effect of OCC office closures on nationally chartered banks, then there is no reason to believe that OCC office closures should have any effect on state-chartered banks as these banks are not regulated by the OCC.

Table 13 reports results for regressions estimating the effect of OCC office closures on state-

chartered banks. Like before, we control for unobserved heterogeneity at the bank, quarter, and office level. We find that OCC field office closure does not cause changes in state-chartered bank leverage. These results suggest that OCC field office closures are directly related with nationally-chartered banks' leverage, while having no effect on state-chartered banks, thus supporting the argument that our results are not being driven by economic conditions.

5.4 Matched Sample: Comparing with State-chartered Banks Located in Same Zip Code

Finally, we estimate a treatment effect for a sub-sample of treated banks for whom there exists a similar state-chartered bank located in the same zip code. By comparing banks located within the same zip code at the same time, this estimation controls for local economic conditions at a more granular level than the county. Table 14 reports results for these regressions. We find similar results as our baseline coefficients.

The results reported in Panel A shows that banks increase leverage following office closures. The change in tier 1 capital to total assets ratio for the treated banks between five years following office closures and the period before closure is 2.8% lower than the similar change for the state-chartered banks located in the same zip code. This coefficient is similar to a decline of 2.7% reported in Table 5. Panel B reports estimates on the effect of office closures on equity components. Unlike our earlier estimates, we find no effect on dividends with this specification. Finally, Panel C reports estimates for the effect of office closures on bank failure and enforcement actions. The coefficients show that increased leverage following office closures has consequences in terms of higher likelihood of failure and enforcement action.

6 Conclusion

We provide evidence that proximity to regulatory field offices affects the risk-taking incentives of financial intermediaries. Field offices and decentralized points of supervisory contact are a common feature of regulatory systems in the United States, Europe and elsewhere. Using a novel panel dataset of field office locations for the Office of the Comptroller of the Currency, a major federal banking regulator, we examine whether office closures result in heightened risk-taking behavior.

We find that banks increase their leverage after the nearest regulatory field office closes. These decreases in bank equity are driven by managerial choices to increase dividends, rather than being driven by mechanical changes, such as loan loss provisioning or write downs. These findings suggest that localized regulatory presence acts as a deterrent against excessive risk-taking.

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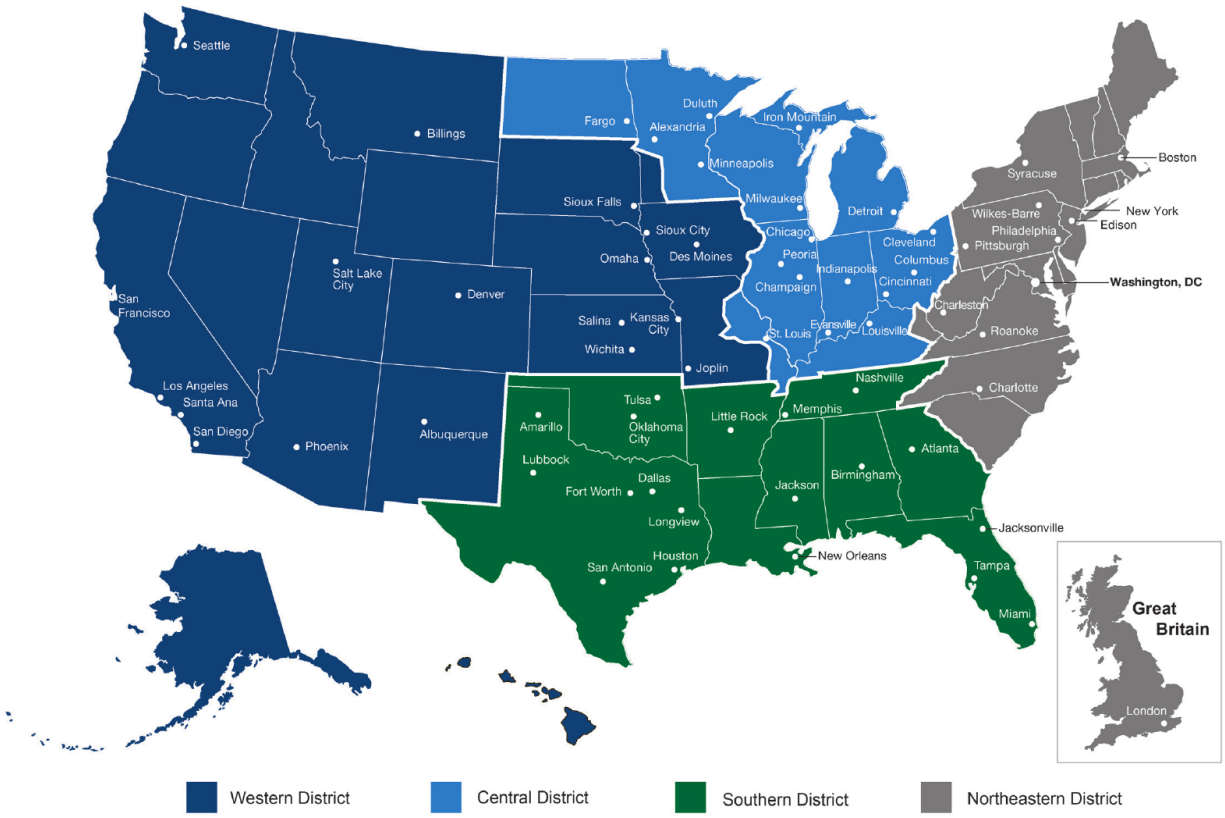
Figure 1: **OCC Field Offices**

This figure gives a snapshot of OCC organizational structure including office locations and the division into districts as of 2013.



Source: Office of the Comptroller of the Currency (OCC), Fiscal Year 2013 annual report

Figure 2: **OCC Field Office Changes**

This figure shows the geographic locations of various OCC offices that appeared during our sample period between 1985--2014. These offices are characterized into four groups: always open during our sample period, opened during the sample period, closed during the sample period and offices that opened and closed during our sample period.

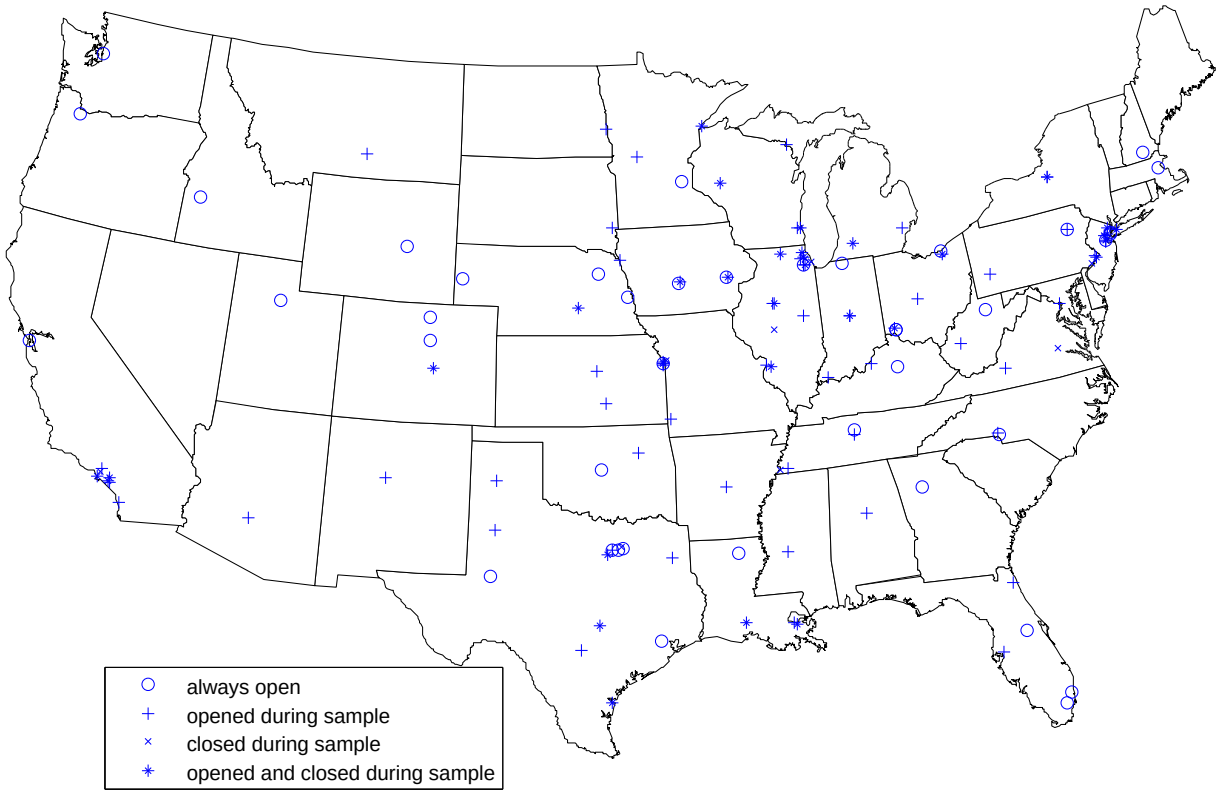
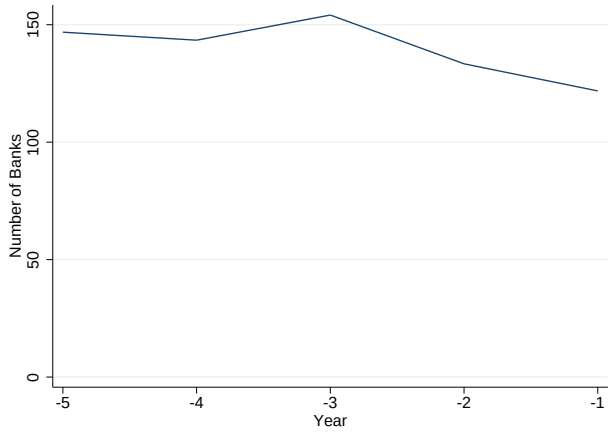
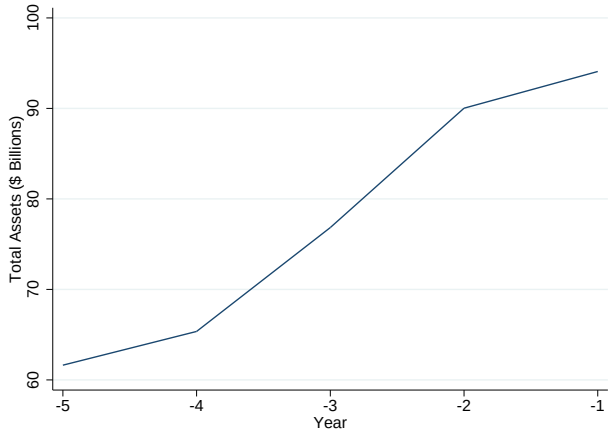


Figure 3: **Why does OCC Open Offices?**

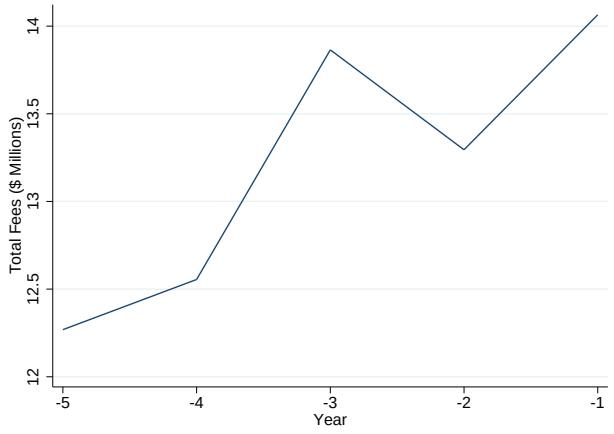
This figure illustrates time trends in the characteristics of the neighboring office located near the newly opened office during the years prior to the opening.



(a) Number of Banks - Neighboring Office



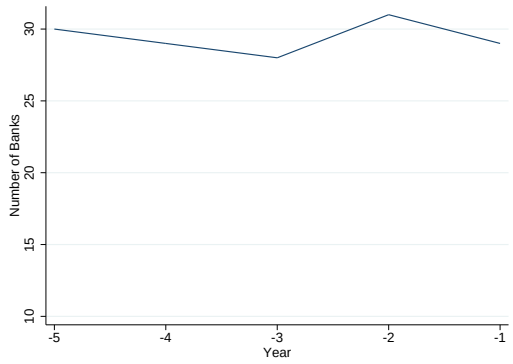
(b) Total Assets - Neighboring Office



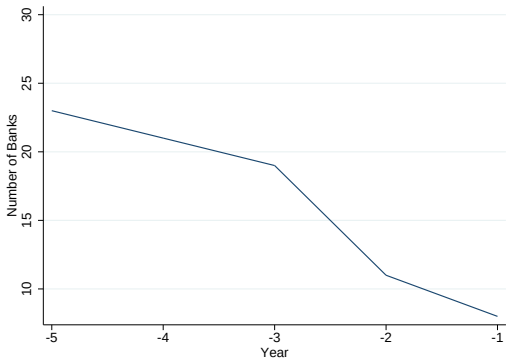
(c) Total Fees - Neighboring Office

Figure 4: **Why does OCC Close Offices?**

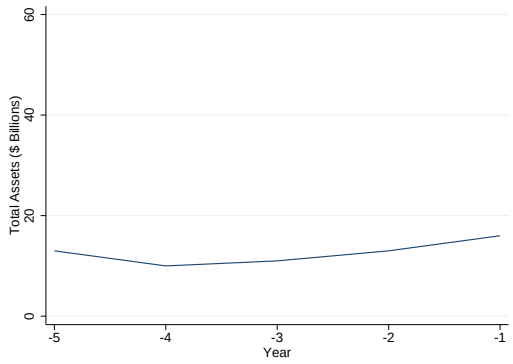
This figure illustrates time trends in the characteristics of the closed office and the neighboring office located near the closed office during the years prior to closing.



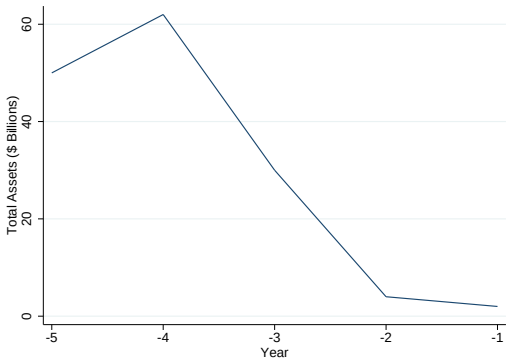
(a) Number of Banks - Closed Office



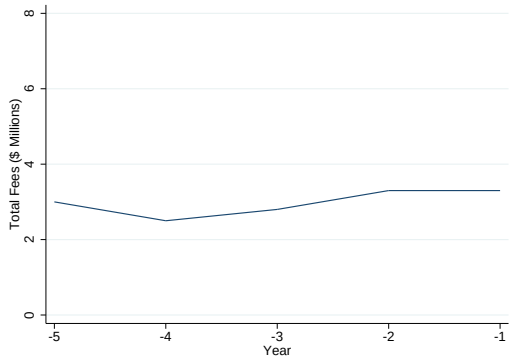
(b) Number of Banks - Neighboring Office



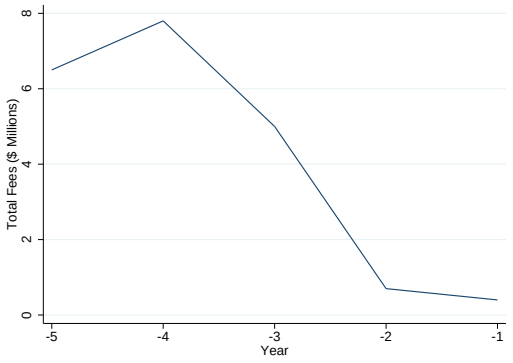
(c) Total Assets - Closed Office



(d) Total Assets - Neighboring Office



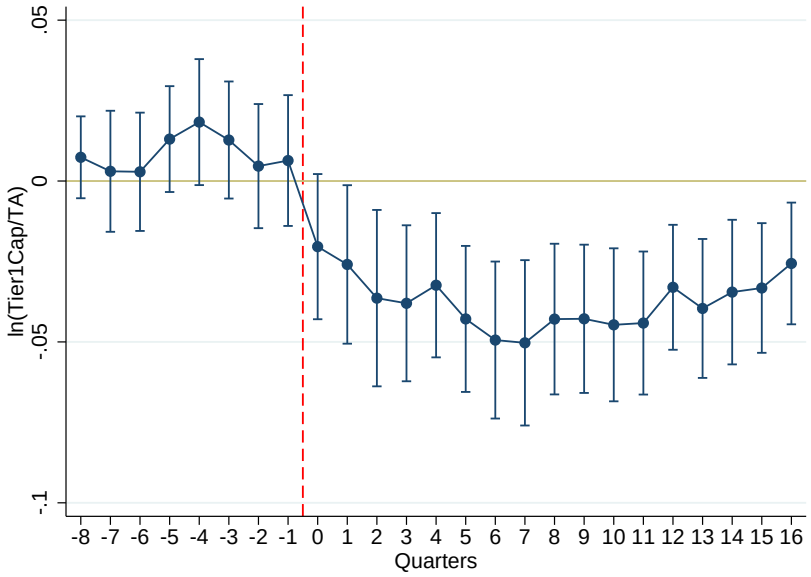
(e) Total Fees - Closed Office



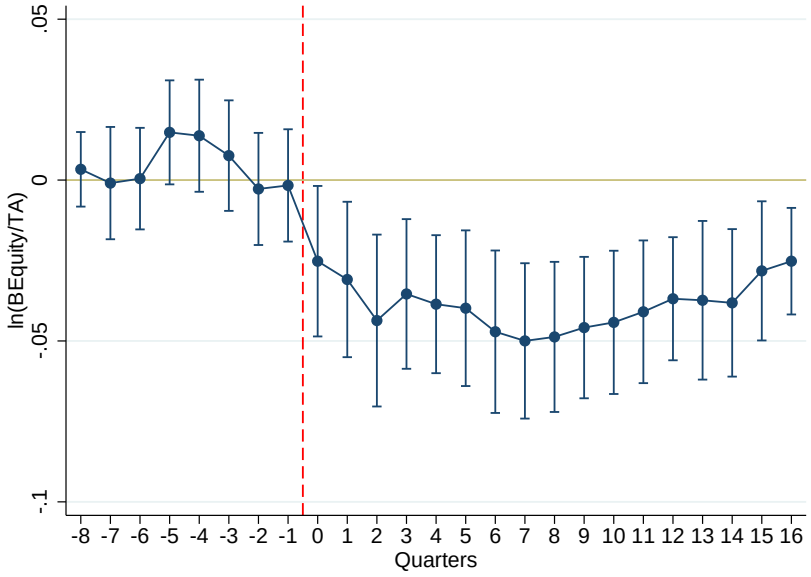
(f) Total Fees - Neighboring Office

Figure 5: **Effect of Office Closures on Bank Capital: Dynamics**

This figure plots the coefficients for the dynamic difference-in-differences regressions that estimate the effect of office closures on bank capital. Each point on the plot corresponds to the difference in outcome variable for treated banks between the given quarter and the mean during the years prior to two years of office closures relative to the same difference in control banks. Vertical bars are 95% confidence intervals based on multi-clustered standard errors at the bank and year-quarter level.



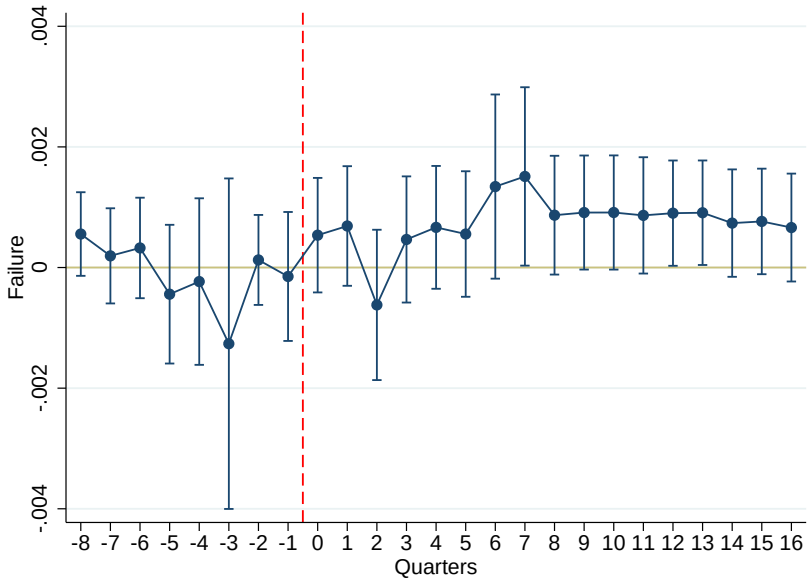
(a) $ln(\frac{Tier1Cap}{TA})$



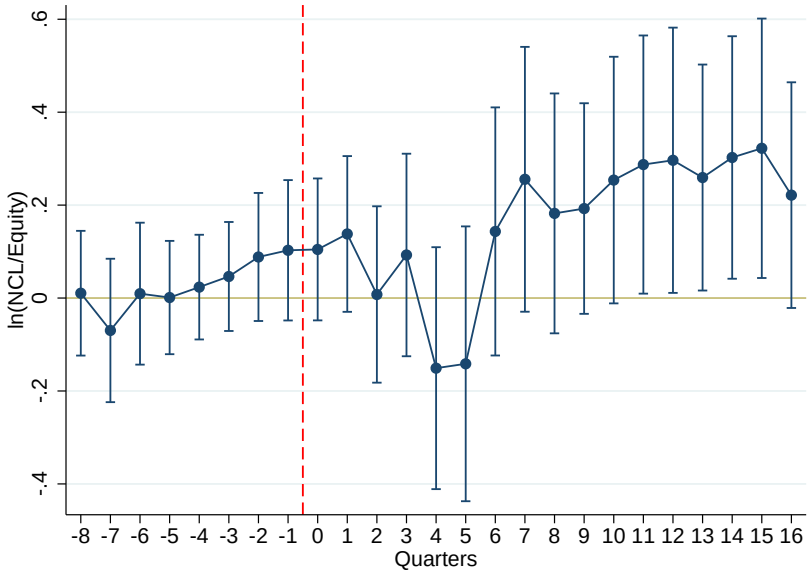
(b) $ln(\frac{BEquity}{TA})$

Figure 6: **Delayed Consequences of Higher Risk: Dynamics**

This figure plots the coefficients for the dynamic difference-in-differences regressions that estimate the effect of office closures on bank failure and NCL. Each point on the plot corresponds to the difference in outcome variable for treated banks between the given quarter and the mean during the years prior to two years of office closures relative to the same difference in control banks. Vertical bars are 95% confidence intervals based on multi-clustered standard errors at the bank and year-quarter level.



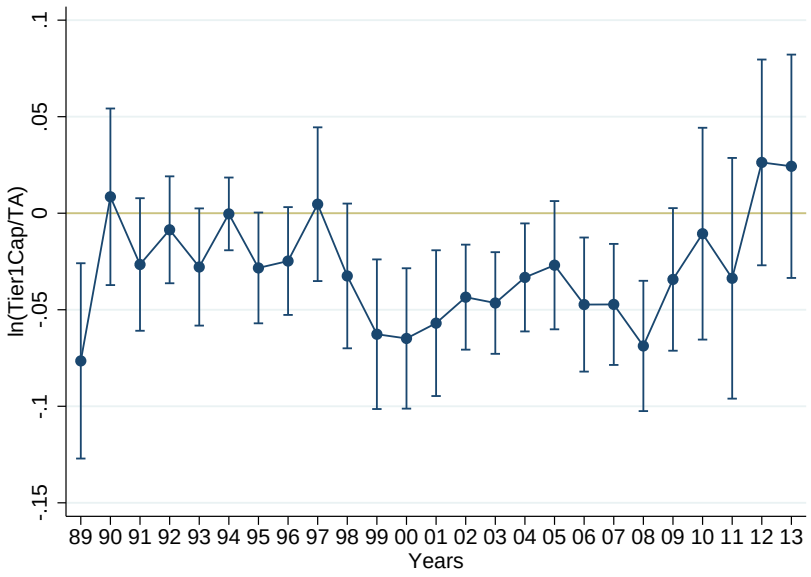
(a) *Failure*



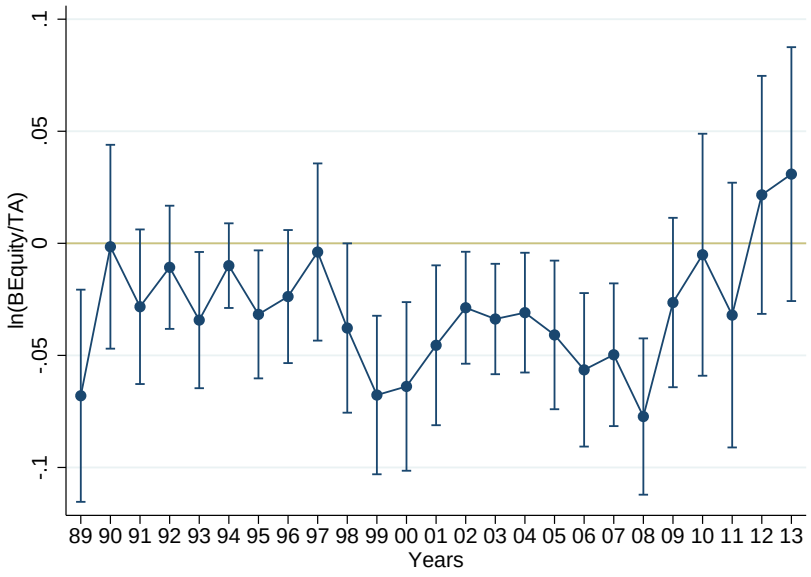
(b) $\frac{NCL}{Equity}$

Figure 7: **Time Trend for the Effect of Office Closures on Bank Capital**

This figure plots the coefficients for the dynamic difference-in-differences regressions that estimate the effect of interaction of office closures and calendar years on bank capital. Each point on the plot corresponds to the difference-in-difference coefficient that estimates the effect of office closures on treated banks relative to the control banks for different calendar years. Vertical bars are 95% confidence intervals based on multi-clustered standard errors at the bank and year-quarter level.



(a) $ln(\frac{Tier1Cap}{TA})$



(b) $ln(\frac{BEquity}{TA})$

Table 1: **OCC Field Offices**

Panel A of this table reports the number of OCC field offices closed and opened each year over our 1985—2014 sample. Panel B reports field office level summary statistics. For each field office we aggregate each quarter the total bank assets and the total annual fee revenue from banks under its supervision. We also report the average distance and driving time from each office to the banks they supervise.

Panel A: Location Changes

Year	Closed	Opened	Total Offices	Year	Closed	Opened	Total Offices
1986	0	1	25	2000	2	2	74
1988	0	1	26	2001	0	2	74
1989	1	0	27	2002	3	0	76
1990	1	57	26	2003	1	0	73
1991	1	0	82	2004	2	0	72
1992	0	4	81	2005	1	2	70
1993	0	1	85	2006	0	1	71
1994	9	0	86	2007	2	0	72
1995	0	6	77	2008	2	1	70
1996	2	0	83	2009	5	2	69
1997	4	1	81	2010	1	2	66
1998	1	0	78	2012	1	0	67
1999	3	0	77	2013	1	0	66
				Total	43	83	

Panel B: Field Office Summary Statistics

	Mean	Std. Dev.	Median	Min	Max	Obs.
Number of Banks	40.643	44.734	30.000	5.000	302.000	2,013
Total Bank Assets (billions)	58.488	171.849	12.501	0.000	1,278.554	2,013
Total Annual Fees (millions)	8.202	14.621	3.405	0.000	96.658	2,013
Distance to Banks (miles)	69.256	41.991	58.147	8.607	274.534	2,013
Driving Time to Banks (minutes)	157.322	84.816	142.750	24.000	444.392	2,013

Table 2: **Nationally-chartered Banks, 1985–2014**

This table reports summary statistics for all nationally-chartered banks supervised by OCC (1985-2014) with total assets less than $10 billion. The unit of observation is bank-quarter. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Failure is an indicator variable which takes a value 1 if the commercial bank fails in a particular quarter, 0 otherwise. Enforcement is an indicator variable which takes a value of 1 if either the bank or an individual at the bank is enforced upon in a given quarter, 0 otherwise. Non-current loans (NCL) over lagged equity (LaggedEquity) is the proportion of loans past due for any given bank-quarter to book equity for the previous bank-quarter. Net charge-offs (NetChargeOff) over previous quarter equity (LaggedEquity) is the proportion of banks' net charge offs to previous quarter book equity. Loan loss provisions (LLP) over previous quarter equity (LaggedEquity) is the proportion of banks' quarterly loan loss provisioning expense to previous quarter book equity. Dividends (Dividends) over previous quarter equity (LaggedEquity) is the proportion of banks' total dividend declared to previous quarter book equity. Net equity issuance (NetEquityIss) over previous quarter equity (LaggedEquity) is the proportion of change in book equity from the previous quarter to current quarter to previous quarter equity. Distance captures the number of files between commercial bank headquarters and the nearest OCC field office. Closing is an indicator variable which takes a value of 1 if, for a given bank-quarter, the distance to the nearest OCC field office increases. Opening is an indicator variable which takes a value of 1 if, for a given bank-quarter, the distance to the nearest OCC field office decreases. Total assets is the size of the bank in millions of dollars. Return on assets (ROA) is defined as quarterly net income over total assets. Time with office is a positive value which calculates the number of quarters a commercial bank interacts with a particular field office. All variables are winsorized at 0.01 level.

	Obs.	Mean	Std. Dev.	Median	Min	Max
Dependent Variables						
$\frac{Tier1Cap}{TA}$	315,581	0.098	0.054	0.086	0.024	0.464
$\frac{BEquity}{TA}$	314,486	0.099	0.051	0.088	0.026	0.433
$\frac{TotCap}{RWA}$	222,982	0.186	0.132	0.151	0.076	1.109
$\frac{Tier1Cap}{RWA}$	222,982	0.174	0.132	0.139	0.060	1.099
Failure	322,965	0.002	0.039	0.000	0.000	1.000
Enforcement	322,965	0.006	0.084	0.000	0.000	5.000
$\frac{NetChargeOff}{LaggedEquity}$	307,099	0.001	0.001	0.000	0.000	0.010
$\frac{NCL}{LaggedEquity}$	307,262	0.000	0.001	0.000	-0.000	0.004
$\frac{LLP}{LaggedEquity}$	307,911	0.014	0.034	0.004	-0.015	0.240
$\frac{Dividends}{LaggedEquity}$	203,367	0.010	0.020	0.000	0.000	0.123
$\frac{NetEquityIss}{LaggedEquity}$	307,912	0.017	0.072	0.018	-0.273	0.419
Office Closure & Control Variables						
Closure	322,965	0.072	0.259	0.000	0.000	1.000
Opening	322,965	0.197	0.398	0.000	0.000	1.000
Distance (miles)	322,965	75.771	65.816	60.431	0.000	329.357
Driving Time (mins)	257,255	180.178	265.482	88.000	3.000	1,291
TA (millions)	314,486	510.113	1,943.694	82.278	6.619	15,662.34
ROA	312,459	0.004	0.008	0.004	-0.039	0.026
Time with Office	322,965	27.129	25.339	18.000	1.000	104

Table 3: **Why does OCC Close Offices?**

This table reports estimates for the linear likelihood regressions that estimate the probability of office closure based on changes in different characteristics of closed and neighboring offices. Closed banks (CBanks) refers to the number of banks directly affected by OCC field office closure subscripted by relative time periods in quarters. Closed assets (CTA) refers to the number of assets supervised by field offices which closed subscripted by relative time periods in quarters. Closed Fees (CFees) refers to the volume of regulatory fees gathered by OCC field offices which closed. Neighbor banks (NBanks) refers to the average number of banks supervised by OCC offices neighboring OCC field offices which closed. Neighbor assets (NTA) refers to the average assets supervised by OCC field offices neighboring field offices that closed. Neighbor fees (NFees) refers to the volume of regulatory fees gathered by OCC field offices neighboring OCC field offices which closed. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	(1) OLS	(2) OLS	(3) OLS	(4) Logit	(5) Logit	(6) Logit
$\frac{CBanks_{t-1}}{CBanks_{t-2}}$	0.0683		0.0549	2.080		2.344
	(1.39)		(1.19)	(1.32)		(1.29)
$\frac{CTA_{t-1}}{CTA_{t-2}}$	-0.0370		-0.0378	0.775		1.133
	(-0.37)		(-0.38)	(0.83)		(0.80)
$\frac{CFees_{t-1}}{CFees_{t-2}}$	0.0488		0.0568	-1.780		-2.450
	(0.31)		(0.35)	(-1.05)		(-1.51)
$\frac{NBanks_{t-1}}{NBanks_{t-2}}$		-0.238***	-0.235***		-1.094	-1.812*
		(-5.99)	(-5.55)		(-1.48)	(-1.74)
$\frac{NTA_{t-1}}{NTA_{t-2}}$		-0.118***	-0.118***		-0.480**	-0.705
		(-6.59)	(-5.48)		(-2.13)	(-1.25)
$\frac{NFees_{t-1}}{NFees_{t-2}}$		-0.306***	-0.306***		-1.331*	-1.901**
		(-6.12)	(-6.13)		(-1.85)	(-2.46)
Office FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	356	356	356	361	361	361
R^2	0.262	0.276	0.277			

Table 4: **Goodness of Match**

This table compares treated and control banks across various dimensions for the quarter before treatment. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Failure is an indicator variable which takes a value 1 if the commercial bank fails in a particular quarter, 0 otherwise. Enforcement is an indicator variable which takes a value of 1 if either the bank or an individual at the bank is enforced upon in a given quarter, 0 otherwise. Non-current loans (NCL) over lagged equity (LaggedEquity) is the proportion of loans past due for any given bank-quarter to book equity for the previous bank-quarter. Net charge-offs (NetChargeOff) over previous quarter equity (LaggedEquity) is the proportion of banks' net charge offs to previous quarter book equity. Loan loss provisions (LLP) over previous quarter equity (LaggedEquity) is the proportion of banks' quarterly loan loss provisioning expense to previous quarter book equity. Dividends (Dividends) over previous quarter equity (LaggedEquity) is the proportion of banks' total dividend declared to previous quarter book equity. Net equity issuance (NetEquityIss) over previous quarter equity (LaggedEquity) is the proportion of change in book equity from the previous quarter to current quarter to previous quarter equity. All variables are winsorized at 0.01 level. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	Treated Banks		Control Banks		Treated–Control
	Mean	Median	Mean	Median	Mean
Matching Variables					
TA (millions)	174.95	101.25	143.16	77.58	31.79
ROA	0.003	0.004	0.004	0.006	-0.001
Dependent Variables					
$\frac{Tier1Cap}{TA}$	0.098	0.087	0.109	0.092	-0.011
$\frac{BEquity}{TA}$	0.101	0.090	0.112	0.095	-0.011
$\frac{TotCap}{RWA}$	0.178	0.147	0.198	0.152	-0.020
$\frac{Tier1Cap}{RWA}$	0.166	0.136	0.185	0.139	-0.019
Failure	0.000	0.000	0.003	0.000	-0.002
Enforcement	0.004	0.000	0.013	0.000	-0.008
$\frac{NetChargeOff}{LaggedEquity}$	0.428	0.170	0.688	0.190	-0.259***
$\frac{NCL}{LaggedEquity}$	1.432	0.880	2.001	1.000	-0.568***
$\frac{LLP}{LaggedEquity}$	0.014	0.004	0.021	0.004	-0.006***
$\frac{Dividends}{LaggedEquity}$	0.017	0.000	0.016	0.000	0.001
$\frac{NetEquityIss}{LaggedEquity}$	0.015	0.014	0.021	0.016	-0.006

Table 5: **Effect of Office Closures on Bank Capital**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	Entire Sample				Matched Sample			
	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{BEquity}{TA})$	(3) $\ln(\frac{Tier1Cap}{RWA})$	(4) $\ln(\frac{TotCap}{RWA})$	(5) $\ln(\frac{Tier1Cap}{TA})$	(6) $\ln(\frac{BEquity}{TA})$	(7) $\ln(\frac{Tier1Cap}{RWA})$	(8) $\ln(\frac{TotCap}{RWA})$
Closure	-0.027***	-0.030***	-0.027***	-0.023***	-0.018**	-0.018***	-0.015*	-0.012*
	(-3.53)	(-3.84)	(-2.90)	(-2.66)	(-2.58)	(-2.70)	(-1.92)	(-1.69)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314315	313344	222624	222624	206011	205454	156583	156583
R^2	0.573	0.598	0.714	0.712	0.594	0.612	0.746	0.745

Table 6: **How do Banks Increase their Leverage?**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank equity components:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Net charge-offs (NetChargeOff) over previous quarter equity (LaggedEquity) is the proportion of banks' net charge offs to previous quarter book equity. Loan loss provisions (LLP) over previous quarter equity (LaggedEquity) is the proportion of banks' quarterly loan loss provisioning expense to previous quarter book equity. Dividends (Dividends) over previous quarter equity (LaggedEquity) is the proportion of banks' total dividend declared to previous quarter book equity. Net equity issuance (NetEquityIss) over previous quarter equity (LaggedEquity) is the proportion of change in book equity from the previous quarter to current quarter to previous quarter equity. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	Entire Sample				Matched Sample			
	(1) $\frac{Dividend}{LaggedEquity}$	(2) $\frac{NetEquityIss}{LaggedEquity}$	(3) $\frac{NetChargeOff}{LaggedEquity}$	(4) $\frac{LLP}{LaggedEquity}$	(5) $\frac{Dividend}{LaggedEquity}$	(6) $\frac{NetEquityIss}{LaggedEquity}$	(7) $\frac{NetChargeOff}{LaggedEquity}$	(8) $\frac{LLP}{LaggedEquity}$
Closure	0.001*	-0.009	-0.000	0.007	0.001**	-0.006	-0.000	0.002
	(1.87)	(-1.26)	(-0.18)	(1.58)	(1.96)	(-0.95)	(-1.04)	(1.45)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	322868	307837	307186	307836	210297	203022	202589	203021
R^2	0.157	0.065	0.070	0.079	0.175	0.033	0.051	0.056

Table 7: **Consequences of Higher Risk**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank failure, enforcement actions, and non-current loans:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Failure is an indicator variable which takes a value 1 if the commercial bank fails in a particular quarter, 0 otherwise. Enforcement is an indicator variable which takes a value of 1 if either the bank or an individual at the bank is enforced upon in a given quarter, 0 otherwise. Non-current loans (NCL) over lagged equity (LaggedEquity) is the proportion of loans past due for any given bank-quarter to book equity for the previous bank-quarter. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	Entire Sample			Matched Sample		
	(1) Failure	(2) Enforcement Action	(3) $\frac{NCL}{LaggedEquity}$	(4) Failure	(5) Enforcement Action	(6) $\frac{NCL}{LaggedEquity}$
Closure	0.0008***	0.0002	-0.0002	0.0008***	0.0004	-0.0003
	(2.97)	(0.21)	(-0.86)	(2.78)	(0.49)	(-1.01)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	322868	322868	307025	210297	210297	202489
R^2	0.071	0.033	0.050	0.047	0.033	0.040

Table 8: **Supervisory Proximity as a Channel**

This table reports estimates for the triple difference regressions of the following form that estimate the heterogeneous effect of OCC office closures on bank capital by distance from the supervisor:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \theta Closure_{it} \times \%\Delta Proximity_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, $\%\Delta Proximity_{it}$ is the percentage change in proximity, measured by driving time (Panel A) and physical distance (Panel B), between bank i and its regulating office following closure, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

Panel A

	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{Tier1Cap}{TA})$	(3) $\ln(\frac{Tier1Cap}{TA})$	(4) $\ln(\frac{BEquity}{TA})$	(5) $\ln(\frac{BEquity}{TA})$	(6) $\ln(\frac{BEquity}{TA})$
Closure	-0.018**	-0.020***	-0.020**	-0.022***	-0.023***	-0.020***
	(-2.41)	(-2.63)	(-2.59)	(-2.77)	(-2.97)	(-2.65)
Closure*(%ΔDrivingTime)	-0.0008***	-0.0009***	-0.0009***	-0.0010***	-0.0011***	-0.0011***
	(-2.53)	(-2.66)	(-2.73)	(-3.07)	(-3.20)	(-3.38)
Sample	All Banks	Below $10Billion	Below $1Billion	All Banks	Below $10Billion	Below $1Billion
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	209707	206044	195932	208866	206126	195998
R^2	0.563	0.567	0.572	0.584	0.590	0.601

Panel B

	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{Tier1Cap}{TA})$	(3) $\ln(\frac{Tier1Cap}{TA})$	(4) $\ln(\frac{BEquity}{TA})$	(5) $\ln(\frac{BEquity}{TA})$	(6) $\ln(\frac{BEquity}{TA})$
Closure	-0.021***	-0.022***	-0.021***	-0.027***	-0.028***	-0.024***
	(-3.01)	(-3.05)	(-2.89)	(-3.47)	(-3.58)	(-3.12)
Closure*(%ΔDistance)	-0.0003	-0.0005*	-0.0005**	-0.0004	-0.0006*	-0.0008*
	(-1.46)	(-1.78)	(-2.09)	(-1.35)	(-1.67)	(-1.80)
Sample	All Banks	Below $10Billion	Below $1Billion	All Banks	Below $10Billion	Below $1Billion
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	230804	226418	214738	229871	226498	214803
R^2	0.598	0.600	0.603	0.577	0.583	0.591

Table 9: **Does Supervisor Proximity Still Matter? Pre vs Post 2000 Subsamples**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital for pre- and post-2000 samples:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{Tier1Cap}{TA})$	(3) $\ln(\frac{BEquity}{TA})$	(4) $\ln(\frac{BEquity}{TA})$
Closure	-0.029***	-0.026***	-0.033***	-0.024***
	(-2.63)	(-3.05)	(-3.13)	(-2.83)
Sample	Pre 2000	Post 2000	Pre 2000	Post 2000
Time with Office Control	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes
Observations	216878	97373	217042	96238
R^2	0.590	0.689	0.610	0.707

Table 10: **Heterogeneous Effects of Office Closure on Bank Capital**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital after segmenting by Holding Company structure (columns 1 - 3) and bank size (columns 3 - 6):

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	Holding Company			Bank Size		
	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{Tier1Cap}{TA})$	(3) $\ln(\frac{Tier1Cap}{TA})$	(4) $\ln(\frac{Tier1Cap}{TA})$	(5) $\ln(\frac{Tier1Cap}{TA})$	(6) $\ln(\frac{Tier1Cap}{TA})$
Closure	-0.047**	-0.025***	-0.011	-0.027***	-0.014	-0.040
	(-2.41)	(-3.21)	(-0.83)	(-3.49)	(-0.59)	(-1.05)
Sample	No HC	Single-HC	Multi-HC	Size≤$1B	$1B<Size≤$10B	Size>$10B
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	68907	138747	106428	291531	17015	4649
R^2	0.615	0.552	0.668	0.575	0.741	0.801

Table 11: **Effect of Office Openings on Bank Capital**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office openings on bank capital:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Opening_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Opening_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after a new office opening that regulates bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{BEquity}{TA})$	(3) $\ln(\frac{Tier1Cap}{RWA})$	(4) $\ln(\frac{TotCap}{RWA})$
Opening	0.0183**	0.0194***	0.0112	0.0108
	(2.55)	(2.72)	(1.25)	(1.29)
Time with Office	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes
Observations	308577	308743	217398	217398
R^2	0.575	0.602	0.713	0.714

Table 12: **Controlling for Economic Conditions & Office Level Changes**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital, equity and failure, after controlling for economic conditions and office level changes:

$$y_{it} = \alpha_i + \alpha_{ct} + \alpha_{ot} + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_{ct} are county×year-quarter fixed effects, α_{ot} are the field office×year-quarter fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Net charge-offs (NetChargeOff) over previous quarter equity (LaggedEquity) is the proportion of banks' net charge offs to previous quarter book equity. Loan loss provisions (LLP) over previous quarter equity (LaggedEquity) is the proportion of banks' quarterly loan loss provisioning expense to previous quarter book equity. Dividends (Dividends) over previous quarter equity (LaggedEquity) is the proportion of banks' total dividend declared to previous quarter book equity. Net equity issuance (NetEquityIss) over previous quarter equity (LaggedEquity) is the proportion of change in book equity from the previous quarter to current quarter to previous quarter equity. Failure is an indicator variable which takes a value 1 if the commercial bank fails in a particular quarter, 0 otherwise. Enforcement is an indicator variable which takes a value of 1 if either the bank or an individual at the bank is enforced upon in a given quarter, 0 otherwise. Non-current loans (NCL) over lagged equity (LaggedEquity) is the proportion of loans past due for any given bank-quarter to book equity for the previous bank-quarter. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

Panel A

	Entire Sample				Matched Sample			
	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{BEquity}{TA})$	(3) $\ln(\frac{Tier1Cap}{RWA})$	(4) $\ln(\frac{TotCap}{RWA})$	(5) $\ln(\frac{Tier1Cap}{TA})$	(6) $\ln(\frac{BEquity}{TA})$	(7) $\ln(\frac{Tier1Cap}{RWA})$	(8) $\ln(\frac{TotCap}{RWA})$
Closure	-0.104***	-0.102***	-0.100***	-0.088***	-0.090***	-0.094***	-0.085**	-0.073**
	(-3.72)	(-3.50)	(-2.94)	(-2.77)	(-2.75)	(-2.81)	(-2.48)	(-2.25)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Office x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	221628	221277	147276	147276	126285	126125	92902	92902
R^2	0.720	0.741	0.828	0.827	0.742	0.758	0.852	0.853

Panel B

	Entire Sample				Matched Sample			
	(1) $\frac{Dividend}{LaggedEquity}$	(2) $\frac{NetEquityIss}{LaggedEquity}$	(3) $\frac{NetChargeOff}{LaggedEquity}$	(4) $\frac{LLP}{LaggedEquity}$	(5) $\frac{Dividend}{LaggedEquity}$	(6) $\frac{NetEquityIss}{LaggedEquity}$	(7) $\frac{NetChargeOff}{LaggedEquity}$	(8) $\frac{LLP}{LaggedEquity}$
Closure	0.003**	-0.051*	0.000	0.016	0.002*	-0.034	0.000	0.009
	(2.34)	(-1.73)	(1.10)	(1.24)	(1.69)	(-1.25)	(0.64)	(1.47)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Office x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226251	216760	215390	216760	128089	124553	123739	124553
R^2	0.410	0.389	0.213	0.437	0.425	0.179	0.219	0.247

Panel C

	Entire Sample			Matched Sample		
	(1) Failure	(2) Enforcement Action	(3) $\frac{NCL}{LaggedEquity}$	(4) Failure	(5) Enforcement Action	(6) $\frac{NCL}{LaggedEquity}$
Closure	0.0021*	0.0030	0.0008	0.0039**	0.0050	0.0011
	(1.72)	(0.74)	(1.33)	(2.12)	(1.02)	(1.35)
Time with Office	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Office x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
County x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	226251	226251	215235	128089	128089	123660
R^2	0.257	0.314	0.168	0.276	0.338	0.156

Table 13: **Placebo: Effect of Office Closures on State-chartered Banks**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital for state-chartered banks:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

	(1) $\ln(\frac{TotCap}{TA})$	(2) $\ln(\frac{BEquity}{TA})$	(3) $\ln(\frac{TotCap}{RWA})$	(4) $\ln(\frac{Tier1Cap}{RWA})$
Closure	-0.0129	-0.00849	0.0159	-0.0172
	(-1.31)	(-1.10)	(1.09)	(-1.02)
Time with Office	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes
Observations	780044	775594	600602	600601
R^2	0.520	0.551	0.636	0.637

Table 14: **Comparing with State-chartered Banks Located in Same Zip Code**

This table reports estimates of difference-in-differences regressions of the following form that estimate the effect of OCC office closures on bank capital, equity and failure for treated banks relative to similar state-chartered banks headquartered in the same Zip Code:

$$y_{it} = \alpha_i + \alpha_t + \alpha_o + \beta Closure_{it} + \gamma X_{it} + \varepsilon_{it}$$

where the subscript i indicates the bank, t indicates year-quarter and o indicates the office regulating bank i, α_i are bank fixed effects, α_t are year-quarter fixed effects, α_o are the field office fixed effects, $Closure_{it}$ is an indicator variable that takes a value of 1 during 20 quarters after closure of the office regulating bank i and 0 otherwise, and X_{it} is a control variable that represents the number of quarters bank i has been regulated by office o. Book equity (BEquity) over total assets is a non-regulatory capital ratio. Tier-1 capital (Tier1Cap) over total assets (TA) is the tier-1 core (leverage) capital ratio as reported by banks or calculated by the FDIC for earlier periods. Tier1Cap over risk-weighted assets (RWA) is the tier-1 risk-based capital ratio. The more inclusive total capital (TotCap) over RWA is the total tier-1 risk-based capital ratio. Net charge-offs (NetChargeOff) over previous quarter equity (LaggedEquity) is the proportion of banks' net charge offs to previous quarter book equity. Loan loss provisions (LLP) over previous quarter equity (LaggedEquity) is the proportion of banks' quarterly loan loss provisioning expense to previous quarter book equity. Dividends (Dividends) over previous quarter equity (LaggedEquity) is the proportion of banks' total dividend declared to previous quarter book equity. Net equity issuance (NetEquityIss) over previous quarter equity (LaggedEquity) is the proportion of change in book equity from the previous quarter to current quarter to previous quarter equity. Failure is an indicator variable which takes a value 1 if the commercial bank fails in a particular quarter, 0 otherwise. Enforcement is an indicator variable which takes a value of 1 if either the bank or an individual at the bank is enforced upon in a given quarter, 0 otherwise. Non-current loans (NCL) over lagged equity (LaggedEquity) is the proportion of loans past due for any given bank-quarter to book equity for the previous bank-quarter. Standard errors are clustered by bank and quarter, and t-statistics are reported in parentheses. *, ** and *** represent significance at 10%, 5% and 1% level, respectively.

Panel A

	(1) $\ln(\frac{Tier1Cap}{TA})$	(2) $\ln(\frac{BEquity}{TA})$	(3) $\ln(\frac{Tier1Cap}{RWA})$	(4) $\ln(\frac{TotCap}{RWA})$
Closure	-0.028***	-0.025**	-0.018	-0.013
	(-2.42)	(-2.24)	(-1.17)	(-0.90)
Time with Office	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes
Observations	46851	46746	35895	35895
R^2	0.591	0.618	0.763	0.766

Panel B

	(1) $\frac{Dividend}{LaggedEquity}$	(2) $\frac{NetEquityIss}{LaggedEquity}$	(3) $\frac{NetChargeOff}{LaggedEquity}$	(4) $\frac{LLP}{LaggedEquity}$
Closure	0.000	-0.030	-0.000	0.004
	(0.33)	(-1.40)	(-1.03)	(1.45)
Time with Office	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Office FE	Yes	Yes	Yes	Yes
Observations	47518	46220	46068	46220
R^2	0.161	0.032	0.051	0.072

Panel C

	(1) Failure	(2) Enforcement Action	(3) $\frac{NCL}{LaggedEquity}$
Closure	0.0017***	0.0038**	-0.0013
	(3.15)	(2.09)	(-1.00)
Time with Office	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Office FE	Yes	Yes	Yes
Observations	47518	47518	46054
R^2	0.055	0.051	0.040