NBER WORKING PAPER SERIES

THE DEATH OF A REGULATOR: STRICT SUPERVISION, BANK LENDING AND BUSINESS ACTIVITY

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Working Paper 24168
http://www.nber.org/papers/w24168

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 2017, Revised March 2019

We thank John Barrios, Aytekin Ertan, Henry Eyring, Anil Kashyap, Anya Kleymenova, Randy Kroszner, David Lucca (discussant), Daniel Paravisini, Raghu Rajan, Thomas Rauter, Stephen Ryan, Amit Seru (discussant), Andrei Shleifer, Tobias Troger (discussant), and workshop participants at the AFA, Chicago Booth, Duke, ETH-NYU-SAFE Law & Banking/Finance Conference, FDIC, IESE, Imperial College, LSE, NBER Corporate Finance meetings, NYU, Rice, Vanderbilt, University of Texas at Dallas, and University of Washington for their helpful comments and suggestions. We also thank Hester Peirce for generously sharing qualitative assessments about the regulatory transition collected from a survey of community bank managers, and Tom Kim, Maximillian Muhn, Fabian Nagel, Thomas Rauter and Steven Vanhaverbeke for their excellent research assistance. Joao Granja gratefully acknowledges support by the William Ladany Faculty Research Fund at the University of Chicago Booth School of Business. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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JEL No. E44,E51,G21,G28,G32,G38,K22,K23,L51,M41,M48

ABSTRACT

An important question in banking is how strict supervision affects bank lending and in turn local business activity. Forcing banks to recognize losses could choke off lending and amplify local economic woes. But stricter supervision could also change how banks assess and manage loans. Estimating such effects is challenging. We exploit the extinction of the thrift regulator (OTS) — a large change in prudential supervision — to analyze economic links between strict supervision, bank lending and business activity. We first show that the OTS replacement indeed resulted in stricter supervision of former OTS banks. Next, we analyze the ensuing lending effects. We show that former OTS banks increase small business lending by roughly 10 percent. This increase is not entirely accounted by a reallocation of mortgage lending and stems primarily from well-capitalized banks and those more affected by the new regime. These findings suggest that stricter supervision operates not only through capital but can also overcome frictions in bank management, leading to more lending and a reallocation of loans. Consistent with the latter, we find increases in business entry and exit in counties with greater expose to OTS banks.

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1 Introduction

A recurring storyline in banking crises is the public backlash against bank supervisors for their failure to take prompt and decisive action to unearth and correct problems of weak banks. These allegations often play an important role in justifying policy interventions that overhaul the regulatory oversight of the banking system, including tighter rules and stricter monitoring of financial institutions (e.g., Financial Institutions Reform, Recovery, and Enforcement Act of 1989; Dodd-Frank Act of 2010). Despite the importance of such interventions, we have limited evidence on the economic trade-offs associated with reforms that aim to limit regulatory forbearance and promote stricter bank supervision.

In this paper, we use a reform of the U.S. banking system that saw a large number of banks transitioning from a more lenient to a stricter supervisor. This transition implied sweeping changes in key areas of bank management, including loan loss recognition, loan risk ratings, stress testing, and risk management, plausibly enhancing their ability to screen and manage loans, in particular, those that are information sensitive. Thus, lending could increase if stricter supervision and monitoring reduce existing agency frictions and/or adverse selection problems that prevented bank managers from lending and adopting better practices under the old regime. Alternatively, a stricter regulatory stance by the new supervisor could put pressure on the balance sheets of transitioning banks, especially when the recovery is still fragile, and in turn force banks to cut lending. Our aim is to examine the economic consequences of stricter supervision, particularly, with respect to access to credit and business activity.

Effective July 2011, Title III of Dodd Frank abolished the Office of Thrift Supervision (OTS) and transferred its powers to other regulators, i.e., the Office of the Comptroller of the Currency (OCC) and the Federal Deposit Insurance Corporation (FDIC). This regulatory change was prompted in part by a well-founded perception that lax prudential supervision by the OTS played a significant role in the demises of Washington Mutual, IndyMac, and Countrywide.[1] The extinction of the OTS was a major change in prudential supervision in the US banking system, affecting roughly 10% of all depository institutions with 8.5% of all U.S. deposits. It applied to banks across a wide spectrum of capital and liquidity levels, operating in different geographies.

The OTS setting overcomes many challenges faced when examining the role of bank supervision for credit access and business activity. First, the associated changes in bank supervision are economically meaningful and their timing is well defined. Second, in this setting, it is possible to distinguish the effects of stricter supervision from local economic

[1] See Committee on Homeland Security and Governmental Affairs (2011) for details on the turf war between FDIC and OTS and evidence on the regulatory failure and leniency of the OTS.

shocks that also affect the performance of banks and local business activity because former OTS banks operate in geographies in which there are banks that have other supervisors. Third, the transition is externally imposed on all thrifts, irrespective of their financial condition. Moreover, we show that charter switches before and after the OTS extinction are rare and do not influence our analysis. However, the setting also comes with challenges. The biggest is that the residential mortgage market was the epicenter of the financial crisis, and this market represents the key area of lending for thrifts. We must, therefore, deal with crisis-induced changes in business models that hit thrifts especially hard.

We begin our analysis by validating that the replacement of the OTS by the OCC and FDIC in 2011 implied relatively stricter supervision.[2] Our initial step is to examine whether former OTS banks experienced observable changes in loan classifications, loss provisioning, and loss recognition when they faced a new supervisor. These are areas of scrutiny in any supervisory exam and a sharp increase in the loan loss accounting ratios immediately following the OTS extinction is indicative that the new supervisors took a stricter stance, for instance, inducing former OTS banks to recognize problem loans. We find that loan loss provisions, charge-offs, and nonperforming loan ratios of former OTS banks exhibit sharp "on-impact" increases following the OTS replacement, relative to control banks without changes in supervision. For instance, the ratio of nonperforming loans increases by approximately 0.4 percentage points for former OTS banks upon transition, which represents roughly 30% of the average ratio of nonperforming loans across all depository institutions.

To illustrate the broader impact of the supervisory change, we provide evidence that the actions of the new regulators (OCC and FDIC) induced former OTS banks to revisit their internal management practices that translated into changes in lending and risk management. We first point to anecdotal and survey evidence that regulators prompted these changes in former OTS banks. We then empirically support these anecdotes with evidence that, relative to other banks, the OCC and FDIC ramped up the number of enforcement actions against thrifts, board and executive turnover at thrifts increased significantly, and that thrifts were more likely to adopt formal risk models following the OTS extinction. We interpret this evidence as consistent with the notion that the increased regulatory scrutiny facilitated improvements in OTS' banks ability to manage their lending activities.

Next, we analyze the economic effects of stricter bank supervision. Forcing thrifts to increase loan loss provisions and recognize problem loans could induce them to de-lever to conserve capital, which likely hurts lending and could create a credit crunch. However, as

[2] To be clear, we are not stating that the OCC and FDIC are flawless, but rather that, on average, they enforce the same banking regulations more strictly than the OTS. On this point, see also the Online Appendix of Agarwal, Lucca, Seru, and Trebbi (2014) for evidence that the OTS performs relatively worse than other regulators.

discussed, the regulatory transition also prompted thrifts to revisit their governance, lending, and risk management practices. Such supervisory-led changes could mitigate existing frictions, be it a reluctance to introduce better risk management practices, to recognize bad loans because of career concerns, or to discontinue cozy local relations that generate private benefits or exert pressures to evergreen bad loans. These frictions would also explain why bank managers did not previously overhaul their loan management and lending practices on their own.[3] Thus, stricter supervisor could not only lead to internal changes, but also to more lending and a reallocation of lending (e.g. Hirtle, Kovner, and Plosser, 2018). In the end, it is an empirical question, which channel dominates and hence whether stricter supervision hurts or boosts lending and local business activity.

We examine this empirical question using the Community Reinvestment Act (CRA) small business lending dataset, which contains information on new small business loans originated by each reporting banks in each U.S. county during a year. This dataset is especially well suited to study how the OTS extinction shaped bank lending because its reporting guidelines did not change over time, thus, providing consistent information on new loans originated both before and after the transition rather than slow-moving stocks of existing loans. Furthermore, small business loans are a substantial fraction of the commercial and industrial lending portfolio of commercial banks and thrifts representing, on average, more than 50% of all commercial and industrial (C&I) loans in the balance sheets of banks.

We show that former OTS banks increase the total amount of small business loans originations by roughly 10% relative to the period prior to the OTS elimination. We obtain this result after the inclusion of county-by-year fixed effects and bank-by-county fixed effects. Thus, the lending effect is not driven by former OTS banks being located in counties with better economic conditions (and higher loan demand) but rather by an increase in the supply of small business loans by former OTS banks relative to small business lending by other banks operating in the same county in the same year. Importantly, we show that these effects occur right after the OTS extinction and that they are unlikely to be driven by systematic differences in the location of former OTS banks within a county.[4]

A plausible explanation for this result is that the new supervisors required former OTS banks to reduce their exposure to residential lending and to diversify from mortgages to

[3] It is also conceivable that adverse selection prevents banks for adopting better risk management practices, even when such practices are beneficial. For instance, a thrift initiating stress testing in 2009 or 2010 could have set off concerns about its financial health, which is less likely when a supervisor forces all thrifts to adopt such practices.

[4] We rule out a number of other potential explanations for our main results in an online appendix of this paper. We address concerns that our results are driven by business model differences between former OTS banks and control banks, by differences in exposure to mergers and acquisitions, by other regulatory changes passed in the Dodd-Frank Act, or by a pull-back of other banks, notably the Top-4 banks, given the evidence in Chen, Hanson, and Stein (2017)

commercial lending. We document that former OTS banks reduce their origination of mortgage loans over our sample period. We show, however, that the increase in small business lending is *not* concentrated in former OTS banks with (i) larger shares of residential loans prior to the OTS extinction; (ii) larger reductions in the supply of mortgage loans following the regulatory transition, and (iii) increases in the rejection rates of mortgage applications. While it is possible that the OCC and FDIC engineered a portfolio reallocation from mortgage to commercial lending in an aggregate sense, these findings imply that we do not observe more pronounced increases in commercial lending in thrifts with more pronounced reductions in mortgage lending and vice-versa. Thus, substitution between mortgage and commercial lending within thrifts does not fully explain our findings.

If not a portfolio reallocation induced by the new regulator, what are the other explanations for the evolution of commercial small business lending following the regulatory transition? We advance two related reasons. First, one reason for not seeing a decline in lending, and hence support for the capital crunch channel, is that former OTS banks were, on average, sufficiently well-capitalized so that they could absorb the additional losses the new supervisors forced to them to recognize without having to de-lever. Thus, unlike other settings where such interventions coincide with financial distress, the OTS setting provides significant variation in the capitalization of former OTS banks prior to the OTS extinction. Consistent with this reasoning, we find that the positive effect of stricter supervision is concentrated in former OTS banks with above-average capitalization ratios prior to the OTS extinction. Thrifts with below-average capital ratios exhibit a decline in their small business lending, consistent with the capital crunch channel.[5]

The other reason for the increase in commercial lending to small firms is that a significant fraction of thrifts experienced shake-ups in internal bank management practices that resolved existing agency frictions and culminated in greater ability to extend credits to hard-to-evaluate small business borrowers. We examine this possibility using three proxies for the scope and intensity of the regulatory intervention in former OTS banks. We find more lending (i) for former OTS banks with larger changes in loan provisioning after the regulatory transition, (ii) for thrifts that likely received greater regulatory attention because their headquarters are located more closely to their new supervisor's field office (Wilson and Veuger, 2017; Gopalan, Kalda, and Manela, 2017; Hirtle et al., 2018), and (iii) for thrifts that experience significant board turnover following the OTS extinction. Thus, our findings suggest that strict supervision can induce banks to overcome existing frictions and lead to changes in how banks assess and manage their loans, which in turn improves banks' credit supply.

[5] We also explore the role of local credit conditions and show that the lending results are stronger in areas where the local competitors were more capital constrained or experiencing negative supply shocks and hence less willing or able to satisfy small business loan demand.

After documenting that, on average, former OTS banks expand small business lending following the regulatory shake-up, we investigate changes in business activity (entry and exit rates) in counties with greater exposure to former OTS banks. These analyses shed light on the reallocation of credit. We find a significant increase in business dynamism in counties with larger exposures to former OTS banks: the semi-elasticities of the entry and exit rates of establishments with respect to a one-standard-deviation increase in the country's share of former OTS deposits are 0.60% and 0.55%, respectively. These findings suggest that the increase in small business lending does not simply translate into more lending to existing businesses. Instead, it suggests that former OTS banks reallocate their lending from old to new establishments. Consistent with this idea, we find larger increases in the entry and exit rates after the regulatory transition in counties with larger changes in small business lending and also greater increases in entry rates in industries that require better access to external sources of finance. Both findings suggest a credit channel and support our interpretation of the results.

Our paper is most closely related to the findings in Agarwal et al. (2014). They exploit the mandatory rotation of the federal and state regulators in the on-site supervision of state-chartered banks and find that the institutional design and incentives of bank regulators affect the supervisory assessments and the corrective actions implemented. However, in this setting, it is difficult to observe how changes in regulatory strictness shape bank lending and economic outcomes over a longer horizon as the supervision by the stricter federal regulators is, by construction, short-lived. We contribute to this line of research by examining the effects of strict supervision on lending and business activity around a regulatory change.

We also contribute to a broad literature on the role of regulators in facilitating regulatory forbearance (Kroszner and Strahan, 1996; Brown and Dinç, 2005; Brown and Dinç, 2011; Costello, Granja, and Weber, 2016 ; Bonfim, Cerqueiro, Degryse, and Ongena, 2016). Our work is also related to papers that examine how evergreening affects the allocation of capital in an economy (e.g. Caballero, Hoshi, and Kashyap, 2008; Bian, Haselmann, Kick, and Vig, 2017; Blattner, Farinha, and Rebelo, 2019). We examine the economic consequences of a well-defined change in the strictness of bank supervision. The novel message of our paper is that stricter supervisors can induce changes in bank management that increase bank lending suggesting that its economic effects go beyond the capital channel.

Finally, our paper contributes to the emerging literature on the economic effects of the Dodd-Frank Act. Examining the effects of Dodd Frank has been challenging because its provisions are often difficult to isolate from other contemporaneous effects of the law as well as concurrent macroeconomic changes. We contribute to this recent stream of literature (e.g., Dimitrov, Palia, and Tang, 2015; Buchak, Matvos, Piskorski, and Seru, 2018a; Buchak,

Matvos, Piskorski, and Seru, 2018b) that exploits granular datasets as well as pre-determined variation in banks' exposure of different geographic regions to overcome these challenges. In doing so, we provide novel evidence on the economic consequences of a key element of the Dodd-Frank Act, i.e., the provisions in Title III that eliminated the OTS.[6]

2 Institutional Setting

Savings and Savings & Loans banks, also called thrifts, specialize in supplying residential mortgages to U.S. consumers. These banks are required by their charter to invest 65 percent of their asset portfolio in qualified thrift investments, which include residential real-estate loans, home-equity loans, mortgage-backed securities, credit card, and small business loans. In return for these restrictive portfolio allocation practices, these banks enjoyed favorable regulatory treatment that included privileged access to financing through the Federal Home Loan Banks, preemption of state law, and unlimited interstate branching.

The Savings & Loans (S&L) crisis in the 1980s and early 1990s hit the thrift industry hard and was blamed, in part, on lenient supervision (e.g., Kane, 1989). The OTS was created in the aftermath of the S&L crisis to replace the Federal Home Loan Bank Board (FHLBB) as the primary regulator of the thrift industry. Initially, the OTS was perceived as strict, cracking down on insolvent thrifts that had been left unscathed by the FHLBB (Wayne, 1992).

Over the following decades, however, sweeping industry and regulatory changes undermined the competitive advantages of the thrift charter. Federal thrifts were the first financial institutions entitled to open new branches across state borders and benefited from the preemption of state law pursuant to the Depression-era Home Owners' Loan Act (HOLA). The passage of the Riegle-Neal Act of 1994 eroded this regulatory advantage, giving the Office of the Comptroller of the Currency (OCC) the power to adopt preemption rules for national banks. In 1995, several unsuccessful bills proposed to abolish the OTS and to consolidate the regulation for thrifts and commercial banks, arguing that the thrift charter had become obsolete (MacDonald, Schwartz, and Day, 2011). The Treasury Department's 2008 blueprint for a modernized financial regulatory structure also recognized that the thrift charter no longer had a special role in providing residential mortgage loans to US consumers. The business models of commercial banks and thrifts had converged substantially and the commercial banks' share of the overall U.S. residential mortgage market surpassed that of the thrifts.

[6] In studying how supervision affects loan loss provisioning, our paper is also related to studies on the timeliness of loan loss provisioning and its economic effects (e.g., Beatty and Liao, 2011; Bushman and Williams, 2012; Bhat, Ryan, and Vyas, 2018). Further, the paper relates to the broader literature on enforcement of financial regulation (e.g., La Porta, Lopez-de Silanes, and Shleifer, 2006; Jackson and Roe, 2009; Christensen, Hail, and Leuz, 2016.)

As a result, the blue print concluded that the thrift charter had lost its *raison d'etre* and recommended phasing it out.

Consistent with these developments, the number of thrifts regulated by the OTS declined from 1,628 in 1994 to 815 in 2007. Between 1998 and 2010, 120 thrifts converted to commercial banks whereas only 43 commercial banks converted to a thrift charter (MacDonald et al., 2011). These trends resulted in a decline in the share of depository institutions regulated by the OTS from 12.5% in 1994 to less than 9.5% in the wake of the 2008 financial crisis. At the same time as its share of the regulatory market declined, the OTS became increasingly associated with initiatives that promoted the reduction of regulations and "red tape". This pro-industry stance is best epitomized in its five year strategic plan released in 2007, which stated that "OTS listens to, learns from, and collaborates with the institutions it regulates and the public it serves on how best to address their needs."

The failures of two large OTS-regulated entities, Washington Mutual and IndyMac Federal Savings Bank during the 2008–2009 financial crisis occurred against this backdrop of greater regulatory competition and perceived regulatory leniency by the OTS.[7] These failed banks jointly represented approximately 3.2% of all US branch deposits and are two of the largest bank failures ever. Countrywide Financial, which had changed its charter in 2006 to be supervised by the OTS, was forced to merge with Bank of America to avoid failure (Appelbaum and Nakashima, 2008a). Following the public and media backlash against the OTS for their alleged failure to properly supervise these institutions (Appelbaum and Nakashima, 2008b), President Obama asked Congress to merge the OTS and OCC.

Title III of the Dodd-Frank Act of 2010 stipulated the closure of the OTS and the transfer of OTS powers and duties to the Federal Reserve, OCC, and FDIC. The transfer of functions occurred on July 21, 2011, one year after the passage of the Dodd-Frank Act. Under the Act, the OCC and FDIC acquired supervisory and rulemaking authority over federally-chartered thrifts and state-chartered thrifts, respectively. In total, 649 federal thrifts automatically transitioned to the OCC, whereas 59 state-chartered thrifts transitioned to the FDIC on July 21st, 2011.[8] The Dodd-Frank Act included other provisions that could potentially affect the operations and lending portfolios of banks. For instance, it created a new regulator, the Consumer Financial Protection Bureau (CFPB), which became responsible for the area of

[7] There is significant documented evidence of regulatory leniency by the OTS. For example, the Office of the Inspector General found that the OTS not only authorized but also directed the backdating of capital contributions from holding companies at IndyMac and BankUnited that allowed these thrifts to stay above the "well-capitalized" threshold (Office of Inspector General, 2009).

[8] These numbers result from our computations based on Summary of Deposits data collected on June 30th of each year. No thrifts banks were automatically transferred to the Federal Reserve, but following the transition a small number of former OTS banks switched their charter from the OCC to the FED. See discussion below and Table 1 for more details.

consumer financial protection and supervises banks whose assets are above $10 billion. It also eliminated restrictions to *de novo* interstate branching in states that had not removed them following the passage of Riegle-Neal Act. These other rules were not implemented at the same time as Title III as they were enacted at the time of the passage of Dodd-Frank into law. Nevertheless, we evaluate and report on the robustness of our results to the adoption of these Dodd-Frank provisions in the online appendix.

As Agarwal et al. (2014) show there is significant variation in regulatory strictness across US regulators. Industry documents and SEC filings of many thrift holding companies suggest that the OCC supervision was perceived as relatively more demanding than OTS supervision, affecting key areas of bank and loan management. In the area of loss recognition, the OTS did not require partial or complete charge-offs for troubled loans. Charge-offs were required at foreclosure only. Moreover, thrifts were allowed to establish specific valuation allowances for estimated losses on troubled real-estate loans when loans should be charged-off. By contrast, the OCC required earlier charge-off when a loan was deemed uncollectible. In addition, the regulatory transition also implied significant changes in how banks determined their Allowance for Loan and Lease Losses and hence their provisioning, which could have significant impact on bank profitability around the transition (e.g., Peirce, Robinson, and Stratmann, 2014). These changes made it, among other things, harder for thrifts to renew or evergreen loans. The 2012 10-K of Bank Financial, a SEC-registered thrift holding company, illustrates these changes by stating: "The OCC maintains a number of operating policies and practices that are different from the OTS, including in the areas of loan classification and the timing of charge-offs...we revised our classification of asset policies and practices to complete our transition to the OCC's loan risk rating practices. The OCC's practices will make it more difficult to renew performing classified loans...at December 31, 2011 approximately $3.5 million of our non-accrual loan balances reflected our decision to liquidate or not renew performing classified loans".[9]

A potential concern is that former OTS banks responded to the stricter OCC supervisory standards by voluntarily switching charter to other regulators. We examine avoidance behavior, in Table 1, which details the operating status and charter of the 708 former OTS banks that mandatorily transitioned from the OTS to the OCC/FDIC on July 21st, 2011. By our

[9] There are many examples of thrift holding companies discussing the transition from OTS to OCC in their 10-Ks expressing more demanding requirements. For instance, the 2012 10-K of WSFS Financial Inc. states: "Lastly, in late 2011, ... we undertook a project to reduce the number of Pass grades in our loan rating system with a goal of recalibrating our loan rating classifications to current OCC and FRS standards ... This resulted in the elimination of our last Pass grade or our "pass/watch" grade. The result of this grade elimination resulted in $67 million being reclassified to Criticized or Classified, with none going to nonaccrual status. The impact of this project contributed to an incremental $2.1 million to the provision and allowance for loan losses in 2011."

computation, 39 of the 649 former OTS institutions that automatically transitioned to the OCC switched to the Federal Reserve or the FDIC by June 30, 2012, and in the four years that followed the OTS extinction an additional 49 institutions decided to switch from the OCC to another primary regulator. This small flow from the OCC to the other regulators suggests that the other supervisors are perceived as similar and that regulatory shopping is unlikely to be a substantive force affecting our empirical analyses.[10] Table 1 further suggests that the attrition rates due to merger, failure, or closure in the OTS sample are similar to those of the sample of commercial bank, alleviating concerns about survivorship bias.

3 Data and Key Variables

We obtain data on the financial characteristics of all commercial banks and savings banks operating in the United States from the Quarterly Reports of Condition and Income and from the Thrift Financial Reports that banks file with the FDIC and the OTS, respectively. Financial information on savings banks prior to 2012 is obtained from the Thrift Financial Report data available for download from SNL Financial. To build consistent time-series of financial characteristics and financial ratios for savings banks, we rely on the TFR-to-Call mapping prepared by the OTS staff using the Research Information System (RIS) Data Warehouse Dictionary maintained by the FDIC.[11]

We collect the dates of all enforcement actions issued by the main federal regulators (OTS, OCC, FDIC, and FED) from their regulatory websites. We use BoardEx to obtain data on board turnover of publicly-listed banks. We follow Bhat et al. (2018) and conduct textual analysis of all publicly-listed banks' 10-Ks to compute a variable that measures whether banks employ or introduce (new) credit risk models to assist their management and lending practices.

Small business lending data for each commercial and savings bank come from the Community and Reinvestment Act (CRA) small business loans database provided by the Federal Financial Institutions Examination Council (FFIEC) pursuant to Regulations 12 parts 25, 228, 345, and 195 of the aforementioned Act. This dataset contains information on the total number and volume of small business loans originated by each reporting financial institutions in each US county during a calendar year. We focus on bank lending within the counties covered by each bank's branch network because as shown in Granja, Leuz, and Rajan (2018), lending in counties outside their branch network is very cyclical and volatile. Since 2005,

[10] We check and find that state-chartered thrifts transitioning to the FDIC and federal thrifts transitioning to the OCC saw similar increases in their provisioning and nonperforming loan ratios following the OTS extinction (Table OA.1).

[11] The document is available online at the following address: http://www.ots.treas.gov/_files/4830092.pdf

all commercial and savings banks whose total assets exceed $1 billion dollars must report this data to the FFIEC. The CRA small business lending dataset also includes aggregate information on the total number and volume of small business loans originated by all reporting institutions at the census-tract level during each calendar year, which we use in robustness analyses.

To provide evidence on the economic effects of the OTS extinction, we use county-level data on the entry and exit rates of establishments in a given year from the Census Bureau's Statistics on US Businesses (SUSB) dataset. The SUSB is carried out on March 12th of each year. Following Chen et al. (2017), we call the entry and exit rate from March 12th of year X to March 12th of year X+1, the entry and exit rate of year X. In the context of our main analysis, we compute the entry and exit rates at the county level for all counties included in the SUSB. For subsequent analyses, we further compute county entry and exit rates for the subset of industries with high and low dependence on external sources of financing. We obtain information on the industry's dependence on external sources of financing from the 2011 Survey of Business Owners and we define this dependence as the percentage of respondent firms in the survey that use bank and government loans, loans from family/friends, credit cards, venture capital investment, or grants as a source of financing.

4 Descriptive Statistics

The abolishment of the OTS directly affected 708 federal and state-chartered thrifts whose primary regulator as of June 30, 2011 was the Office of Thrift Supervision (Table 1). Panel A of Table 2 presents descriptive statistics for the key variables in our analyses, separately for commercial banks and former OTS banks. The average size of commercial banks is substantially greater than the average size of thrifts. The median size and quartiles of thrifts are, nevertheless, greater than those of commercial banks. These differences exist because the larger systemically important financial institutions organize as commercial banks, creating a substantial right skew in the size distribution of commercial banks.

The lending portfolio of former OTS banks is tilted toward residential mortgage lending, which comprises approximately 40% of their asset portfolio. This portfolio allocation suggests that former OTS banks are still influenced by their historical role in the supply of residential mortgage loans to US consumers. Commercial banks have more diversified loan portfolios with C&I loans and commercial real estate (CRE) loans accounting for 9.5% and 23% of their total assets, respectively. These loan categories account for only 3.3% and 17.2% of the total assets of thrifts. These patterns highlight important differences across two groups of banks, which we address explicitly in our empirical analyses.

In spite of the differences in the composition of the loan portfolios across commercial banks and thrifts, the average loan quality of the lending portfolios does not differ substantially across the two groups. The average nonperforming loan ratios of commercial and former OTS banks over the sample period are 1.2% and 1.3%, respectively, and their ratios of provisions to total assets are also very similar. The capital ratios of former OTS banks are, nevertheless, substantially higher than the ratios of commercial banks. The relatively high capitalization rate of former OTS banks is an important feature of our setting and allows us to examine the effects of strict supervision through channels other than (low) capitalization.

In Panel B of Table 2, we report additional descriptive statistics for the sample of CRA-reporting banks. Again, we see that commercial banks originate on average more small business loans than former OTS banks, which is consistent with the above discussion. However, the differences in the size distribution between commercial and former OTS banks are not as pronounced in the CRA-reporting sample when measured in terms of their total deposits and number of branches. We also compare the mean annual house-price appreciation in counties where commercial banks and former OTS banks originate loans and find that the house-price appreciation is, on average, higher for commercial banks. These statistics suggest that controlling for differences in loan demand across counties is important for our analysis.

5 OTS Extinction and Strict Supervision

5.1 OTS Extinction and Loan Loss Recognition and Provisioning

In this section, we provide evidence that the transition from the OTS to the OCC and FDIC resulted in stricter supervision of former OTS banks. We begin by examining the evolution of loan loss ratios at former OTS banks. One of the main areas of scrutiny by banking regulators is to ensure that delinquent loans are adequately classified and that loan losses are properly recognized and provisioned. Thus, a sharp increase in loan loss ratios following the OTS extinction suggests that the new regulators strictly enforced the correction of weaknesses in the loan loss accounting of former OTS banks.

We begin with a simple descriptive analysis. In Figure 1, we plot the average loan loss provision and average nonperforming loan ratios of banks that were formerly regulated by the OTS and those of all other commercial banks. Throughout most of the pre-crisis years, the average provisioning effort of commercial banks exceeded that of the former OTS banks, with the exception of the provisioning effort of OTS banks during the third quarter of 2008. After the extinction of the OTS, however, there is an increase in provisioning of former OTS banks relative to that of other commercial banks. This wedge persists until the fourth quarter of 2012

and then disappears as the provisioning ratios of former OTS banks converge to those of other commercial banks. There is a similar pattern in the time series of the nonperforming loan ratios for both groups. The nonperforming loan ratio is systematically lower for former OTS banks throughout the crisis year but increases sharply with the OTS extinction and remains above that of commercial banks until the end of the sample period. These figures suggest that the loan loss recognition of former OTS banks became stricter around the regulatory change.

To formally examine whether the OTS extinction is associated with stricter supervision, we estimate the following linear regression model:

$$Y_{i,t} = \beta OTS_i \times Post_t + \theta X_{i,t} + \gamma_i + \delta_t + \epsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ is the loan loss provisioning ratio, nonperforming loans ratio, charge-off ratio, or Allowance for Loan and Lease Losses (ALLL) ratio of bank i in quarter t. OTS is a dummy variable that takes the value of one if the bank was formerly regulated by the OTS and $Post$ is a dummy variable taking the value of one following the OTS extinction in the third quarter of 2011, inclusive. As the average size and loan portfolio composition of former OTS banks and commercial banks are very different, we also include a vector $X_{i,t}$ containing financial characteristics such as size, portfolio composition and capitalization of the bank. One concern is that the assets of former OTS banks have worse unobserved quality (e.g. lower collateral values) than those of other banks. We deal with this possibility by including bank fixed-effects, γ_i, which control for time-invariant, unobserved characteristics of each bank. We also add quarter fixed-effects, δ_t, to control for changes in aggregate economic conditions, which could be correlated with the extinction of the OTS. We cluster standard errors at the level of banks' county headquarters.

Table 3 reports the results of this analysis and confirms the interpretation of Figure 1. The main coefficient, β , is statistically significant and suggests that the loan loss provision ratios and nonperforming loan ratios of former OTS banks increase by approximately .018 and .369 percentage points after the OTS extinction. In both cases, these magnitudes are economically meaningful and correspond to approximately a 20 and 30 percent increase, respectively, relative to the unconditional average of these variables over the entire sample period. We also conduct this analysis using the charge-off ratio, which measures a bank's propensity to write-off bad loans, and the ALLL ratio, which measures the total bad-debt allowance. Columns (5) to (8) report results for these alternative dependent variables and again suggest that former OTS banks faced stricter supervision following the OTS extinction. We further note that conditioning on measures of size, portfolio composition, and capitalization does not attenuate the coefficients of interest relative to the specifications that do not include any additional controls for financial characteristics. This observation makes it less likely that

differences in business models between former OTS and commercial banks drive our results.

If the transition of former OTS banks to the OCC and FDIC are indeed the result of stricter supervision, then we expect the above transitioning effects to be more pronounced during the first supervisory examination cycle following the OTS extinction. Towards this end, we investigate whether the OTS extinction generates a sharp "on-impact" effect on the accounting and loan loss recognition variables. To trace the evolution of the OTS extinction effects over time we estimate the following linear regression model:

$$Y_{i,t} = \sum_{t} \beta_t (OTS_i \times \delta_t) + \theta X_{i,t} + \gamma_i + \delta_t + \epsilon_{i,t} \tag{2}$$

which expands the model of equation 1 with an interaction of the OTS dummy with a set of quarter dummies that take the value of one in each quarter of the sample period.

Figure 2 plots the series of coefficients, β_t, and corresponding standard errors. The plots suggest that, during the financial crisis period, the OTS was more permissive than the regulators of commercial banks, consistent with anecdotal evidence. The provisioning and nonperforming loan ratios of former OTS banks stayed significantly below those of commercial banks with the same characteristics. These ratios experienced a sharp turnaround immediately following the OTS extinction. During this period, both the provision and nonperforming loan ratios see a significant relative increase for thrifts. The plots also suggest that the accounting and reporting adjustments are completed around the start of 2013. Around this time, the provisioning efforts of thrifts converge to those of other commercial banks and the difference in the level of nonperforming loan ratios across banks plateaus. This normalization around 2013 suggests that the thrifts are not taking new risks that materialize in greater losses by the end of 2015.

We perform a battery of robustness tests to confirm that the regulatory transition rather than other spurious relations drive the documented effects. In unreported tests, we find that the effect of the OTS extinction persists if we restrict attention to the subsamples of below-median and above-median capitalization banks, suggesting that the effect is not confined to the subsample of poorly capitalized banks. Next, when we add interactions between the *Post* dummy and the financial characteristics vector, X, the results and inferences remain similar. Some attenuation of the main coefficients in their magnitude is expected if the regulatory transition also affects these financial characteristics (e.g., lending composition). As such, it is not clear that these interactions should be included in the model, which is why we perform this test as sensitivity analysis only. We also find that the results are statistically and economically similar in the subsample of federal thrift charters, which were automatically transferred to the OCC upon the OTS extinction, and in the subsample of state thrift charters,

which were automatically transferred to the FDIC upon the transition.

Overall, we interpret the evidence as confirming the anecdotal evidence reported in section 2 and as suggesting that the transition of former OTS banks to the OCC and the FDIC implied stricter supervision.

5.2 OTS Extinction and Changes in Management and Lending Practices

In this section, we provide evidence that the actions of the new regulators (OCC and FDIC) go beyond loan loss recognition and, in particular, induced former OTS banks to improve their lending and risk management practices. In Section 2 and in the appendix to this paper, we offer anecdotal evidence that the new regime induced changes in key areas of bank and loan management. Many thrifts purchased new software solutions or hired consultants to assist with the more complicated OCC requirements (Bayer, 2014). According to a SageWorks Poll (SageWorks, 2013), over 50 percent of responding bankers indicated that they had to strengthen their risk rating system as a result of feedback from OCC examiners and 38 percent indicated that they had to implement stress testing.[12] Furthermore, publicly available enforcement actions imposed by the OCC on thrifts suggest that the OCC forced changes in key management personnel and executive directors, in the processes for collecting documentation of loan collateral, in the procedures to obtain updated financial information from existing borrowers, in the tools used to manage credit risk, and required that extensions of credit were granted only after obtaining relevant credit information.[13]

Next, we provide more systematic empirical support for changes in key bank management areas after the regulatory transition. Banking regulators periodically evaluate the quality of banks' management in the context of their on-site examinations and visitations. The regulators often identify issues in the operations of the banks, such as weaknesses in loan underwriting and credit administration and bring those to the attention of the bank's Board and management through examination reports and other correspondence. When the banks do not correct these issues, the regulators have the option to pursue enforcement actions to force banks to make corrective actions. We examine whether the OCC/FDIC's stricter regulatory stand manifested in enforcement actions issued to induce changes in the operations of former OTS banks.

[12] https://www.sageworks.com/blog/post/2013/11/14/biggest-areas-of-change-transitioning-from-OTS-to-OCC.aspx

[13] In the appendix to this paper (Figure OA.1), we illustrate some of these requirements with passages taken from formal written agreements completed during 2012 between the OCC and multiple former OTS banks.

Second, we investigate whether the regulatory transition led to palpable changes in the management of former OTS banks using three proxies. First, we investigate whether the regulatory transition is associated with greater rates of board turnover, defined as the ratio between the sum of entry of new directors and exit of existing directors and the average number of directors in the bank during the year. Second, we analyze if the transition is associated with a higher likelihood of exit of executive directors of former OTS banks. We explore these measures to ask whether the new regulators induced changes in the composition of the board, either through enforcement actions (see Figure OA.1) or mere guidance. Finally, we follow Bhat et al. (2018) and create a disclosure-based proxy for the use of credit risk modeling and stress testing by financial institutions. A relative increase in this measure following the OTS extinction would be indicative that former OTS banks updated their credit risk models and risk management in response to regulatory pressures.

We present the results of this analysis in Figure 3 and Table 4. Figure 3 plots the evolution of the main outcome variables. The results are striking: the board turnover rates and the use of credit risk models of thrifts are consistently lower than those of commercial banks prior to the OTS extinction. Following the OTS extinction, however, these patterns flip and thrifts see greater rates of board turnover and increased adoption of credit risk modeling. Table 4 presents regression results using the framework of equation 1 on the outcome variables described above. The board turnover, exit of executive directors, and risk model variables are only available at an annual frequency for the subset of publicly listed banks. Specifications (1) and (2) suggest that the new supervisors bring significantly more enforcement actions upon former OTS banks following the OTS extinction. This result confirms the idea that the OCC/FDIC sought to impose changes on thrifts by using enforcement actions more frequently. We also find that the OTS extinction is associated with greater rates of board turnover – columns (3) and (4) – and exit of executive directors – columns (5) and (6). In particular, the exit rates of executive directors increase by four percentage points, which compares with an unconditional likelihood of director exit around eight percent. Finally, we observe in columns (7) and (8) that former OTS banks increase their adoption of credit risk models following the regulatory transition.

There are a few possible explanations for the stricter supervisory approach of the OCC and FDIC relative to the OTS. A plausible explanation is that the OCC was less constrained in its supervisory resources (e.g. Eisenbach, Lucca, and Townsend, 2017) and substantially increased the number of hours dedicated to monitoring former OTS banks. Similarly, OCC examiners could be more skilled than those of the OTS and better able to detect and correct potential issues at the banks.[14] We do not, however, have access to data on the resources and

[14] The Office of Inspector General reports on the transfer of OTS functions to the OCC (Office of Inspector

capabilities of the OTS, which would be necessary to shed light on whether lack of resources explains the differences in the supervisory attitudes of regulators. Alternatively, the OTS may have adopted a softer stance than other regulators in dealing with banks that were exposed to local economic shocks or, relatedly, because the OTS was captured by its regulated entities. In Tables OA.2 and OA.3 of the Online Appendix, we report empirical analyses suggesting that the corrective actions of the OCC were more pronounced in banks exposed to areas with greater house price declines between 2007 and 2010 and in banks headquartered in states under the jurisdiction of the Western Division of the OTS, whose regional director, Darrel W. Dochow, received significant negative attention for the cozy ties he arguably maintained with the thrifts that his regional division monitored (e.g. Story and Morgenson, 2011). These results support the idea that the differences in regulatory strictness between the OTS and the OCC are, at least, partly explained by differences in their wiliness to enforce the regulatory standards.

Overall, the results suggest that the stricter approach to supervision of the OCC/FDIC created additional pressures on the balance sheets and loan loss ratios of former OTS banks. These pressures are likely to have the direct effect of increasing incentives to conserve capital and could imply a reduction in lending. On the other hand, this stricter approach likely induced banks to improve their loan and risk management systems. This channel suggests that the action of strict regulators could prompt changes in the ability of banks to assess the viability of a project, therefore, potentially moving them towards more information-intensive and hence more sophisticated lending (e.g., to small businesses), rather than just simple residential lending based on housing collateral.[15]

6 OTS Extinction and Bank Lending

In this section, we analyze how the supervisory transition affected bank lending. We use a dataset of small business loans, collected under the auspices of the Community Reinvestment Act, which is especially well suited to examine the evolution of C&I lending around the regulatory transition. The reporting guidelines of this dataset did not change around the regulatory transition and, therefore, it offers consistent information on new loans originated during a year. Moreover, it provides information on quantities and amounts of new loans

General, 2014) and interviews of senior personnel of the OCC (American Bankers Association, 2011) suggest that the examinations of both national banks and federal savings associations were staffed with a combination of examiners from the OTS and OCC.

[15] Here, it is interesting to note the parallel to the tensions described in Rajan and Zingales (2003) who suggest that truly financially developed systems require sophisticated lenders that are willing to provide funds to viable borrowers that do not enjoy the reputation or possess the ability to pledge collateral with the lender.

originated over time rather than slow-moving stocks of existing loans. Finally, small business loans are a substantial fraction of the C&I lending portfolio of commercial banks and thrifts representing, on average, more than 50% of all C&I loans in the balance sheets of banks.

A simple plot of the time-series of small business loan originations by former OTS banks and other commercial banks presented in Figure 4 shows that *total* small business lending of former OTS banks increases following the OTS extinction. While total small business lending of commercial banks grew as well, albeit modestly, the total small business lending of former OTS banks outpaces that of their commercial bank counterparts after the OTS extinction. This simple plot already suggests a positive effect on small business lending after the regulatory transition. Of course, Figure 4 does not address that lending of former OTS banks could increase more rapidly because of differences in business models or because the former OTS banks are located in areas that experienced higher growth in demand for small business credit relative to areas where other commercial banks are located.

We control for these effects by exploiting information on the amount of small business loans that CRA-reporting banks originate by county during a calendar year. Thus, we are able to compare the small business lending of former OTS banks in a county relative to the small business lending of other commercial banks that operate in the same county during the same calendar year. The empirical strategy relies on the idea that banks operating in the same counties are subject to similar shocks to credit demand. Hence, by comparing lending of former OTS banks and other commercial banks in the same county we are better able to isolate the effect of the OTS extinction on the supply of credit. We estimate this effect with the following specification:

$$Ln(TotalLoans)_{i,c,t} = \beta OTS_i \times Post_t + \theta X_{i,c,t} + \gamma_{c,t} + \delta_{i,c} + \epsilon_{i,c,t} \tag{3}$$

where $Ln(TotalLoans)_{i,c,t}$ is the natural logarithm of the total amount of small business loans originated by bank i in county c in calendar year t. OTS is a dummy variable that takes the value of one if the bank was regulated by the OTS prior to the OTS extinction and $Post$ is a dummy variable taking the value of one following the OTS extinction in the calendar year 2011, inclusive. $X_{i,c,t}$ is a vector of characteristics of the bank that includes quadratic controls for the branch presence and total deposits collected by a bank in a county. The county-by-year fixed effects, $\gamma_{c,t}$, control for unobserved common shocks that affect a county during a calendar year. In addition, we introduce bank-by-county fixed-effects, $\delta_{i,c}$, which control for unobserved time-invariant characteristics of the presence of each bank in each county as well as differences in business model. Standard errors are clustered at the county level. The inclusion of county-by-year and bank-by-county fixed effects ensures that former OTS banks are compared with commercial banks originating loans in the same county and

year and, therefore, that the results are not driven by greater demand for small business loans in counties where former OTS banks are located.

We report the results of this analysis in Table 5. In Column (1) we estimate a specification that includes year, bank, and county fixed effects and in Column (2) we present our preferred specification of equation (3) that includes county-by-year and bank-by-county fixed effects. The coefficient on the main variable of interest, $OTS_i \times Post_t$, is statistically significant in all specifications and the estimates are also economically meaningful. In our preferred model reported in Column (2), the OTS extinction is associated with an 8.8% increase in the volume of small business loans originated by former OTS banks. The magnitude of the main coefficient declines between Columns (1) to (2) suggesting that not properly accounting for differences in unobserved demand shocks across former OTS banks and commercial banks could inflate the coefficients.

The average total assets and holdings of C&I loans differ substantially across former OTS banks and commercial banks. Thus, a potential concern is that commercial banks are not an adequate control group for former OTS banks as they are larger and specialize in very different types of loans. We use coarsened exact matching (Iacus, King, and Porro, 2012) to ensure that we compare former OTS banks with other commercial banks of similar size and similar share of C&I holdings. The results reported in column (3) suggest that, if anything, the economic magnitude of the estimated effect increases when we match on these dimensions.

Another concern is that former OTS banks and commercial banks locate in different areas within a county, which would not be addressed by the fixed effects in the model. We address this concern in two ways. First, we compute a bank- and county-specific house price index that captures house price changes in the zip codes where banks have a branch presence within a county and we re-estimate the model including this additional control. This variable potentially captures systematic differences in the location strategies of former OTS and commercial banks at the zip level and, therefore, absorbs some of the potential unobserved heterogeneity in within-county loan demand, which is not accounted by the fixed effects. The results, reported in Columns (4) through (6), are quantitatively similar to those of columns (1) through (3), suggesting that our results are not driven by such differences in local credit demand.

Second, we draw on Nguyen (2019) and exploit an alternative CRA dataset that contains aggregate information on the total small business loans originated at the finer census-tract level by all CRA-reporting banks. We compare changes in aggregate small business lending in census-tracts with a significant share of deposits held by former OTS banks with changes in the aggregate small business lending of other census-tracts located in the same county that have a smaller share of deposits held by former OTS banks. The results, reported in

Table OA.4 of the Online Appendix, suggest that aggregate small business lending increases significantly in census tracts with significant exposure to branches of former OTS banks relative to census tracts where former OTS banks have no branch presence, corroborating our main results in Table 5.

Next, we augment the model of equation (3) to include a series of interactions between the OTS dummy and year dummies. This analysis serves two purposes: i) it examines whether the relation between the OTS extinction and small business lending is relatively sharp around the regulatory transition rather than an ongoing trend towards small business lending, and ii) it addresses concerns that the effects capture mean reversion in the performance of former OTS banks. We plot the series of coefficients and corresponding standard errors from estimating this model in Figure 5. The plot suggests that i) there are no significant pre-trends, which we interpret as suggesting that commercial banks operating in a county are an adequate control group for the former OTS banks operating in the same county, and that ii) the main coefficients see a sharp increase following the OTS extinction. These patterns supports the interpretation that the increase in small business lending is a direct cause of the regulatory change in supervision rather than mean-reversion in the performance of former OTS banks.

To be sure, we examine whether the relation between the OTS extinction and small business lending survives a battery of robustness tests. Specifically, we confirm that the results are robust to (i) controlling for the total assets of banks, the interaction of this variable with the Post dummy and weighing the observations by total amounts lent by banks in the county (Table OA.5), (ii) controlling for the lending behavior of the Top-4 banks (Chen et al., 2017) and for the participation of the bank in Troubled Asset Relief Program (TARP) (Table OA.6) (iii) adjusting for mergers and acquisitions of banks to make sure the results are not driven by changes in sample composition (Table OA.7), (iv) controlling for the impact of other Dodd-Frank provision that might have affected small business lending (Table OA.8), and (v) accounting for the potential parallel impact of the regulatory transition on the stringency of the Community and Reinvestment Act (CRA) examinations of thrifts (Table OA.9).

Overall, we conclude that the change in supervision led to an increase in small business lending by former OTS banks. Furthermore, we refer back to Figure 2 to note that despite this increase in lending following the OTS extinction, the non-performing loan ratios of former OTS banks are converging, albeit slowly, to those of other commercial banks. This ongoing convergence suggests that this additional lending is not associated with greater loan delinquencies. We will revisit the implications of this additional C&I lending in Section 8.

7 Cross-Sectional Heterogeneity in the Effects of the OTS Extinction

7.1 Portfolio Reallocation

A plausible explanation for the sharp increase in small business lending following the regulatory transition is that the OCC and FDIC traditionally supervised banks that held more diversified lending portfolios than former OTS banks. The OCC and FDIC could, therefore, have compelled thrifts to follow suit by reducing their large exposure to residential lending while reallocating those resources toward commercial lending. This conjecture implies both that former OTS banks reduced their exposure to the residential lending market following the regulatory transition and that the OTS extinction prompted a greater increase in small business lending precisely for those thrifts that saw greater declines in mortgage lending.

First, we examine whether there is empirical support for the idea that former OTS banks originate fewer mortgage loans following the OTS extinction. Using the granularity of the Home Mortgage Disclosure Act (HMDA) dataset, we estimate an empirical specification akin to that of equation (3) to compare changes in mortgage lending by former OTS banks with changes in mortgage lending by other commercial banks operating in the same census tracts. The results, reported in Tables OA.11 and OA.12 of the online appendix, suggest that former OTS banks originate between 5 and 15 percent fewer mortgage loans and increase rejection rates of mortgage applications between 0.2 and 1 percentage points following the OTS extinction relative to other commercial banks operating in the same areas. However, further empirical analyses reported in the online appendix (Figures OA.3 and OA.4) suggest that this lower volume of mortgage lending is not necessarily a sharp effect associated with the regulatory transition and might be part of a trend that goes back to 2008. This result, therefore, suggests that the decline in mortgage lending of former OTS banks could reflect a response to the events of the financial crisis, changes in regulatory strictness, or both.

Second, the portfolio reallocation explanation implies that we should see a more pronounced increase in small business lending when former OTS banks have (i) a greater concentration of residential loans prior to the OTS extinction; (ii) larger reductions in the supply of mortgage loans following the regulatory transition, and (iii) increases in the rejection rates of mortgage applications around the regulatory transition. In Table 6, we stratify our sample of CRA-reporting banks based on these three dimensions.[16] Our results do not support the idea that the increase in small business lending by former OTS banks is largely explained by substitution

[16] We have also controlled for changes in mortgage lending, mortgage rejection rates, and pre-crisis shares of residential lending directly in the specification of equation (3) and find results that are quantitatively and qualitatively similar to those of Table 5.

from mortgage to commercial lending. The results reported in columns (1) and (2) suggest the effect of the OTS extinction on small business lending does not depend significantly on the degree of exposure of former OTS banks to the residential lending market prior to the OTS extinction. Columns (3) and (4) indicate that former OTS banks that most reduce their supply of mortgage lending also reduce small business lending following the transition, and the results of columns (5) and (6) suggest that the small business lending only increases significantly in the subset of former OTS banks that lowered their rates of mortgage rejection between 2010 and 2012 and in that sense became more permissive in their mortgage lending.[17]

While it is still possible that the OCC and FDIC engineered a portfolio reallocation from mortgage to commercial lending in an aggregate sense, our findings do not support the idea that the increase in small business lending after the extinction of the OTS is explained solely by a reallocation between mortgage and commercial lending within thrifts. The portfolio reallocation conjecture cannot explain why we see some thrifts increasing small business lending at the same time that they increase mortgage lending while some other thrifts reduce small business lending at the same time that they cut mortgage lending.

7.2 Bank Capitalization and Changes in Management Practices

The lending results, together with the earlier loss recognition results, are seemingly inconsistent with a large literature showing that financial institutions significantly cut lending in response to loan losses negatively affecting their balance sheets and capital (e.g. Peek and Rosengren, 2000; Chodorow-Reich, 2013; Bord, Ivashina, and Taliaferro, 2017). Based on this literature, one would predict that stricter supervision should lead to less lending, rather than more, due to its effect on bank capital. It is possible that the relatively well-capitalized former OTS banks expand their lending as the poorly-capitalized former OTS banks are forced to recognize their losses and scale back their lending. But such a substitution effect from poorly-capitalized to well-capitalized banks could not explain why average or aggregate lending by former OTS banks increases. In fact, most former OTS banks that survived the crisis to see the regulatory transition are relatively well-capitalized and could easily absorb the loan provisioning and loss recognition imposed by the new supervisors. Thus, our setting provides the opportunity to examine if there are effects beyond the capital channel and potentially other reasons why banks expand their lending after stricter supervision.

We start by examining whether the relation between stricter supervision and small business lending varies with the capitalization of banks prior to the OTS extinction. In Columns (1)

[17] We also examined enforcement actions to former OTS banks and commercial and we could not identify incidences in which the OCC ordered banks to reallocate their lending. Interestingly, we found such instances for the OTS before its extinction.

and (2) of Table 7, we stratify the sample based on the Tier 1 Capital ratio reported by each financial institution in the last quarter of 2010. The results are striking: thrifts with above-median regulatory capital (within the sample of former OTS banks) increase small business lending while thrifts with below-median ratios significantly reduce their total small business lending following the OTS extinction. These results should be interpreted with caution as the regulatory capital of banks could capture other unobservable characteristics related to banks' willingness to lend. Nevertheless, the differential effects depending on bank capitalization are important. The results for below-average capitalization are largely consistent with prior literature that emphasizes the role of bank capital for lending. Based on this literature, poorly-capitalized banks are likely to scale back lending when they are forced to recognize losses and have little capital. [18]

However, our finding that well-capitalized banks expand their lending upon facing new regulators that prompt them to overhaul their lending practices is novel. It points to frictions in bank management and suggests that there are other channels through which supervision can affect lending. It suggests that relatively stricter supervision can help banks overcome agency frictions and affect their lending practices and the allocation of credit. To explore this idea, we examine whether the increase in small business lending following the OTS extinction is more pronounced in former OTS banks that were treated more strongly by the new supervisors, using three different proxies.

First, we conjecture that former OTS banks whose loan loss classification and provisioning practices ostensibly were the subject of scrutiny by the OCC and FDIC, and hence were also more strongly treated on other dimensions of bank and loan management. Thus, we should see larger lending effects in banks that show greater increases in loan loss provisioning around the OTS extinction. To test this conjecture, we partition the sample based on the above- and below-average growth in the loan loss provisions between the four quarters that preceded and the four quarters that followed the OTS extinction (Columns (3) and (4)). The results support the conjecture and show that the positive effects of the OTS extinction on small business lending are concentrated in former OTS banks that receive greater scrutiny from their new regulators.

Next, we build on extant work (Wilson and Veuger, 2017; Gopalan et al., 2017; Kandrac and Schlusche, 2018) showing that geographic proximity between regulators and banks reduces information barriers between them. Lower information barriers help regulators limit existing agency frictions at banks, which in turn, induces banks to better manage their internal control

[18] Interestingly, in Table OA.10 of the Online Appendix we find that the effects of the OTS extinction are concentrated in areas where the commercial banks, as local competitors, were more capital constrained and, therefore, less willing to extend credit, which in turn allowed the former OTS banks to expand their lending after the regulatory transition.

function. We investigate if the proximity between the headquarters of the bank and the closest OCC field office is associated with more pronounced lending effects following the regulatory transition. The results in columns (5) and (6) suggest that the positive lending effects of the OTS extinction are concentrated in the subset of former OTS banks that are relatively close to an OCC field office.

Finally, the results of specifications (7) and (8) stratify the subsample of public banks based on whether the bank saw at least one of its executive directors exit in the period that followed the OTS extinction. The idea is to build on the results of the previous section and assess whether the lending effects were stronger in the subset of former OTS banks that saw executive turnover following the transition.[19] Despite being limited to a smaller sample of publicly-available banks with available information on executive turnover, the analysis find statistically significant results suggesting that the lending effects associated with the OTS extinction are more pronounced in the subsample of former OTS banks that experienced an exit in their top management.

These results are consistent with the notion that greater regulatory scrutiny and changes in management induced by the OCC/FDIC following the OTS extinction reduced existing agency frictions, which in turn increased small business lending by former OTS banks.

8 Effects of OTS Extinction on Aggregate Economic Outcomes

We have documented that the regulatory transition of former OTS banks is associated with an increase in small business lending. A remaining question is whether this increase in small business lending due to stricter supervision of former OTS banks contributes to a better allocation of capital at the local level, e.g., by prompting banks to cut nonperforming loans to incumbents and redirecting lending to new businesses in the same county.

While we cannot directly observe the identities of loan recipients, we can investigate how greater exposure to former OTS banks following the OTS extinction is associated with changes in the aggregate entry and exit rates of businesses at the county level. Entry of new businesses is likely to be sensitive to changes in the availability of credit to small owners as the latter are typically credit constrained. An increase in the entry and exit rates in counties with greater exposure to former OTS banks would be consistent with the idea that these banks are terminating delinquent loans and financing new businesses.

We compute the exposure of a county to former OTS banks as the share of deposits in

[19] Here, we stratify the sample based on the departure of an executive following the OTS extinction but the results are unaltered if we stratify based on the board turnover ratio after the regulatory transition.

a county that is held in branches of former OTS banks as of June 30, 2010.[20] We plot the spatial distribution of the county exposure to former OTS banks in Figure 6. We draw two insights from the plot. First, it suggests that spatial correlation or regional clustering is not a great concern in this setting. The counties with high exposure to former OTS banks are scattered throughout the United States. Second, the plot shows that more than half of the U.S. counties have no exposure to former OTS banks. As these counties comprise a majority of the sample and could be structurally different from counties with OTS exposure, we exclude them from the analysis.

We calculate the entry (exit) rate as the ratio of new entrants (exits) in the county to the number of existing businesses in the county. We formally examine the relation between these two variables using the following OLS specification:

$$Y_{c,t} = \beta ShareOTS_c \times Post_t + \theta X_{c,t} + \gamma_c + \delta_t + \epsilon_{c,t} \tag{4}$$

where $Y_{c,t}$ represents the entry and exit rate of new establishments in county c during year t, ShareOTS is the share of deposits held in branches of former OTS banks as of June 30th, 2010, Post is a dummy variable taking the value of one following the OTS extinction during the calendar year 2011, inclusive. $X_{c,t}$ is a vector of characteristics comprising the number of bank branches and level of deposits held in the county, the number of establishments in the county, and the size composition of the establishments operating in the county measured by the number of establishments in the county that employ 1–4, 5–9, 10–19, 20–49, 50–99, 100–249, and 250–499 people. The year fixed effects, δ_t, control for overall trends in the evolution of entry and exit rates and the county fixed effects, γ_c, control for time-invariant unobservable characteristics of each county. As before, we cluster the standard errors at the county level.

We report the results of this analysis in Table 8. In Panel A, we present results for an OLS specification and also for weighted least squares (WLS) specifications, in which we weigh each observation by the level of employment in the county. We find considerable increases in business dynamism in counties most exposed to OTS banks. The main coefficients of interest, β, are statistically significant and suggest that the OTS extinction is positively related to entry and exit rates of establishments. The economic magnitudes are also meaningful: the semi-elasticities of the entry and exit rates of establishments in response to a standard deviation increase in the share of former OTS deposits in the county are 0.60% and 0.55%, respectively. These findings suggest that the increase in small business lending does not simply translate into greater flow of credit to all existing establishments, but rather is consistent with

[20] We compute the county exposure to former OTS banks using the deposit levels of 2010, rather than those of an earlier year to avoid including WaMu and Indymac in these computations.

a pattern in which former OTS banks no longer evergreen loans of some troubled incumbents and supply credit to new establishments.

Similar to the analyses depicted in Figures 2 and 5, we estimate how the effects of greater exposure to former OTS banks on entry and exit rates change over time. We expand the specification of the model in equation (4) by interacting *Share OTS* with a series of indicator variables that take the value of one in each year of the sample and plot the corresponding coefficients and respective standard errors in Figure 7. Consistent with the notion that stricter supervision increased lending and business dynamism, we find that greater exposure to former OTS banks is significantly and positively associated with entry and exit rates following the OTS extinction, but not prior to the regulatory transition.

In Table 8, Panel B we examine whether these effects vary based on the overall increase in lending growth. We stratify counties based on the percentage change in the aggregate amount of small business loans originated during 2010–2012. The results of Panel B suggest that the effects of the OTS extinction are more pronounced in areas that experienced more growth in lending. The results also suggest that the OTS extinction is associated with an increase in both entry and exit in counties experiencing high growth in small business lending, rather than an increase in the entry rate in counties experiencing high growth in credit supply and an increase in exit in counties experiencing low growth in credit supply. These results are consistent with the anecdotal evidence that the former OTS banks tightened their standards for loan renewals and hence reallocated their lending to new establishments.

We conclude our analysis with an additional test to gauge whether the increase in business dynamism is related to new lending. If the regulatory transition increases business dynamism, the effects should be particularly pronounced in industries that are more dependent on external sources of financing. We exploit data from the Survey of Business Owners on the dependence from external sources of finance at the 2-digit SIC industry level and we then sort industries by below- and above-median external dependence. The strategy, which is akin to that of Rajan and Zingales (1998), is to examine whether the exposure to former OTS banks is associated with a larger effect on entry and exit rates in industries that are more dependent on external financing.

We re-estimate the model of equation (4) in the below- and above-median external financing subsamples using data on entry and exit rates at the industry-county level. We report these results in Table 9. We find that the effect of greater county exposure to former OTS banks on entry rates is greater in industries that require greater access to external sources of finance, which suggests a financing channel and supports our interpretation of the business dynamism results. However, for the exit rates, the coefficient magnitudes for the OTS extinction effect are not much different across both subsamples, which we view as a caveat to our interpretation.

9 Conclusion

An important question in banking is how strict supervision affects bank lending and in turn local business activity. Bank supervisors face a tradeoff between, on one hand, protecting the financial system by forcing banks to correct weaknesses in how they assess and manage their loans, to recognize their troubled loans, and to ensure adequate provisioning for future loan losses and, on the other hand, causing a credit crunch for the real economy by being too strict with banks, especially shortly after a financial crisis.

In this paper, we examine this tradeoff by examining the elimination of the OTS by the Dodd-Frank Act, which occurred shortly after the Great Recession. This transition of former OTS supervised banks to new regulators, the OCC and the FDIC, which have a much stricter regulatory approach that affects key areas of bank management, including loan loss recognition, loan risk ratings, stress testing, and risk management, allows us to analyze the economic links between strict prudential supervision, bank lending and business activity.

We confirm first that the regulatory transition resulted in stricter supervision, as evidenced by significant changes in their loan loss recognition and loan provisioning shortly after the OTS extinction. On average, we do not find evidence that stricter supervision led to a credit crunch, except for those OTS banks that were thinly capitalized. Instead, we document that former OTS banks on average increase their lending to small businesses following the regulatory transition by approximately 10 percent. The increase is concentrated in well-capitalized banks as well as in banks that are more strongly treated by the new regime, i.e., those with larger changes in their provisions and recognition of non-performing loans and those that are more closely related to their new regulator's field offices. Thus, even well capitalized banks were reluctant to recognize loan losses and overhaul their lending practices, rating systems and risk management until the treatment by the stricter supervisor. These findings suggest that stricter supervision operates not only through capital but also can overcome frictions in bank management, spurring improvements in loan and risk management and leading to more lending and a reallocation of loans.

Consistent with the latter, we find evidence that entry and exit rates for businesses increase in areas with a larger presence of former OTS banks, consistent with former OTS banks not renewing loans to existing borrowers and lending to new establishments. Thus, our paper provides evidence how a policy intervention that significantly curtails regulatory forbearance shapes credit supply and business activity following a financial crisis.

There are two important caveats to our analysis. First, we document economic effects for the years after the regulatory transition. But we do not know how the elimination of the OTS will play out in the long run. It is, for instance, an open question whether the decline in the

number of supervisors and corresponding increase in regulatory concentration benefits the financial system in the long haul. Second, the US banking system features many small banks. Our analysis is, therefore, more likely to be relevant for smaller and perhaps less sophisticated banks. However, there are several banking systems around the world that feature a significant fraction of smaller banks (e.g., Germany and Italy).

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Figure 1: Time Series of Loan Loss Recognition

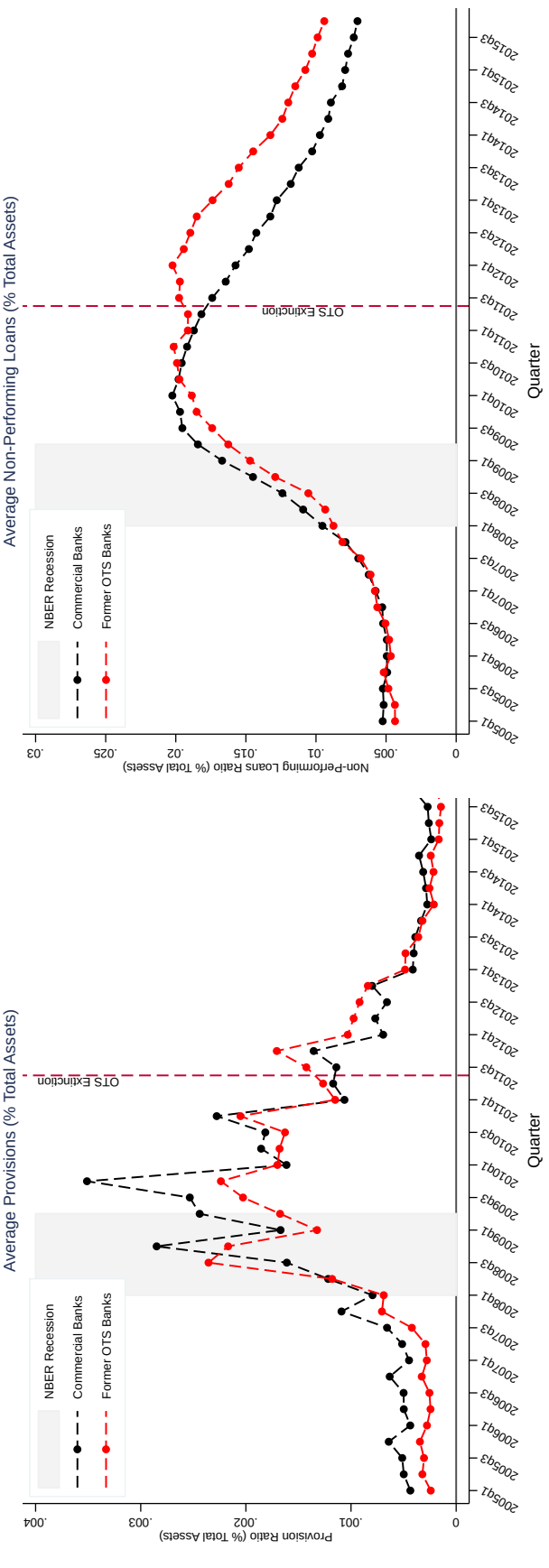

Figure 1 plots the average loan loss provision ratio (loan loss provision divided by total assets) and average nonperforming loan ratio (nonperforming loans divided by total assets) of former OTS banks and all other commercial banks during the period 2005Q1 to 2015Q4. Data are from the FFIEC Call Reports and from the Thrift Financial Reports.

Figure 2: OTS Extinction and Loan Loss Recognition over time

Figure 2 plots the estimated impact of OTS supervision on the loan loss provision ratio and nonperforming loan ratio in each quarter of the sample period using OLS regressions. The shallow circles represent the series of coefficients β_t from interacting a set of dummy variables representing each quarter in the sample with a dummy variable taking the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision in the following model specification: $Y_{it} = \gamma_t + \theta_i + \sum_t \beta_t OTSExtinction_{it} \times \gamma_t + \delta X_{it} + \epsilon_{it}$ and the vertical bands represent 90% confidence intervals for the point estimates in each quarter. The figure on the left represents the series of coefficients in a model where the loan loss provision ratio is the dependent variable. The figure on the right represents the series of coefficients in a model that uses nonperforming loan ratio as the dependent variable.

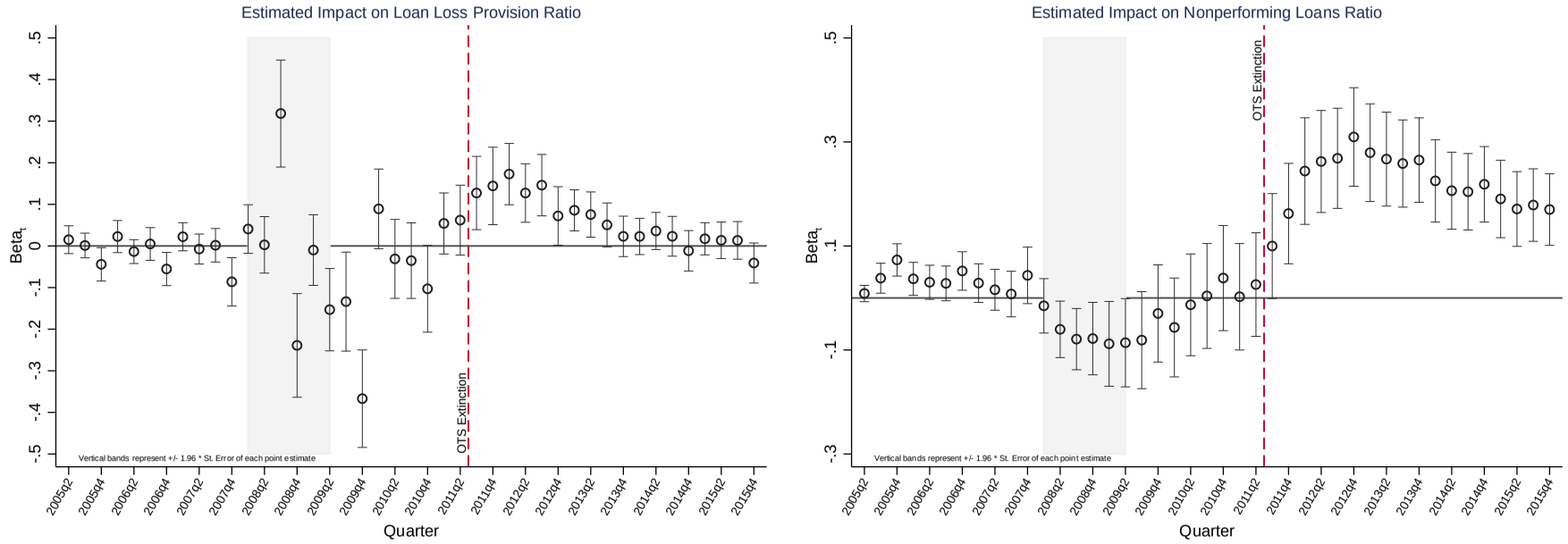

Figure 3: Time Series of Direct Regulatory Intervention Measures

Figure 3 plots the average board turnover (sum of entries and exits of board directors divided by average number of board directors) and share of banks adopting of risk models (defined as mentions of words "risk" and "model" within ten words of each other in the annual 10-K of the bank) of former OTS banks and all other commercial banks during the period 2005–2015. Data are from the FFIEC Call Reports and from the Thrift Financial Reports, regulatory filings, BoardEx, and 10-Ks of publicly traded banks.

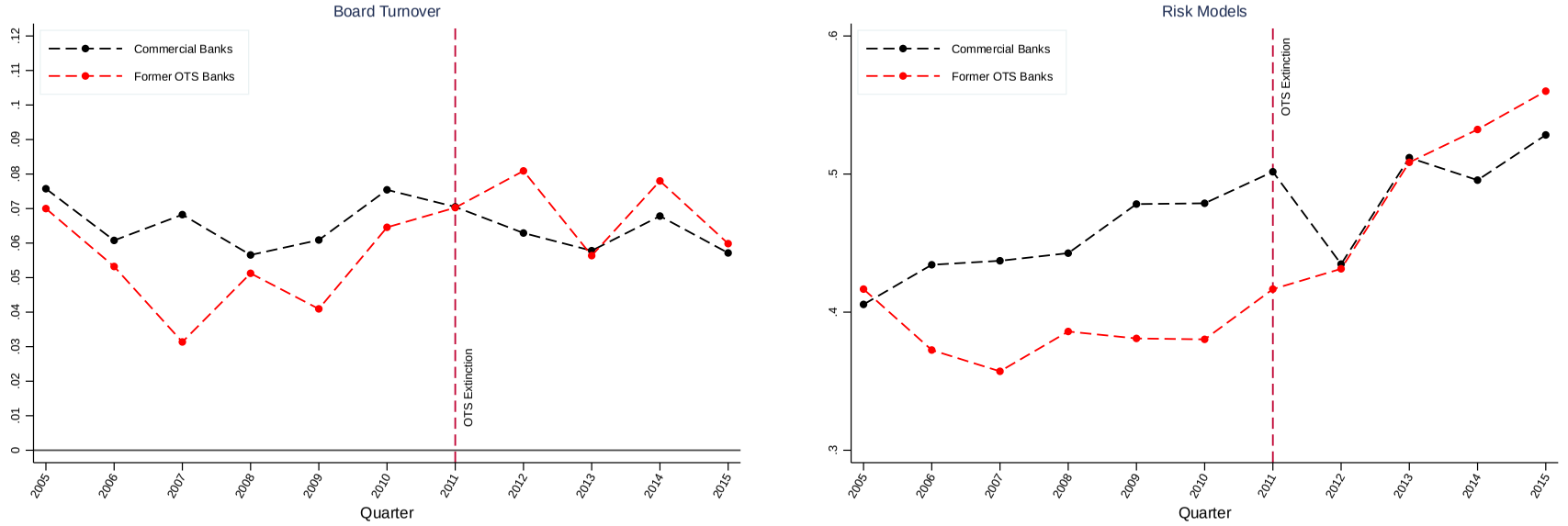

Figure 4: Total Annual Origination of Small Business Loans by Former OTS Banks and Other Commercial Banks

Figure 4 plots an index of the total volume of small business loans originated by former OTS banks and other commercial banks. Former OTS Banks are banks that reported the OTS as their primary regulator during 2010. Other Commercial Banks are all other banks that report to the CRA dataset. To avoid composition effects we employ a balanced sample of commercial banks and former OTS banks that were part of the CRA-reporting sample for the entire sample period.

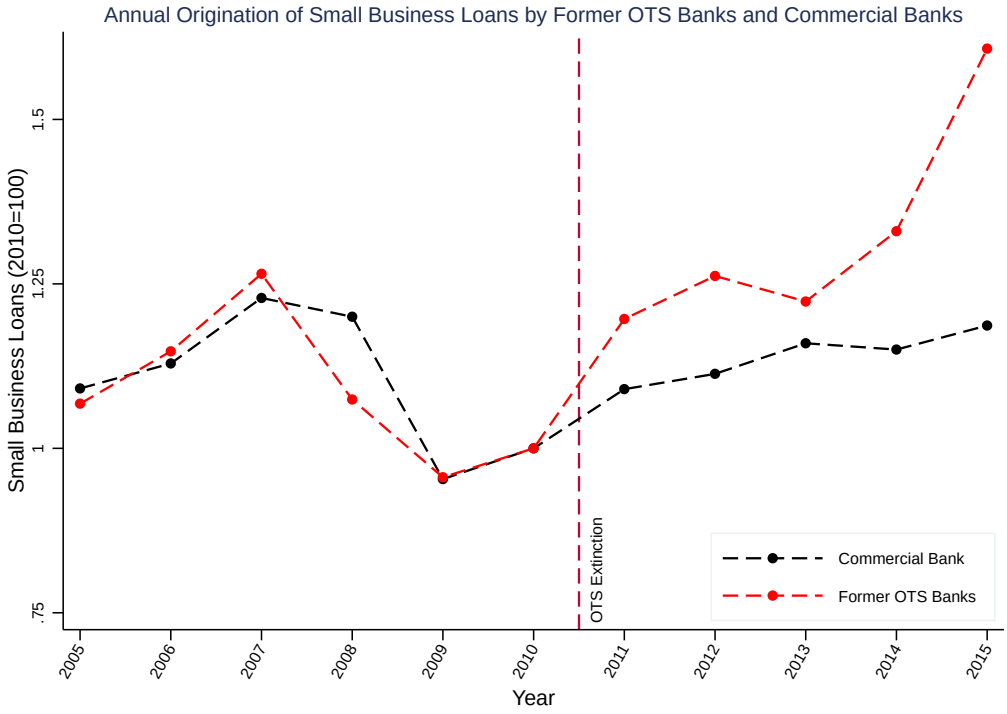

Figure 5: Small Business Lending and OTS Extinction: Impact over Time

Figure 5 plots the average impact of OTS supervision on small business lending in each year of the sample period. The shallow circles represent the series of coefficients β_t from expanding the model specification in column (3) of Table 5 to include a set of interaction variables between year dummies and a dummy variable taking the value of one if the depository institution's primary regulator in 2010 was the Office of Thrift Supervision and the vertical bands represent 90% confidence intervals for the point estimates in each quarter. Data on small business lending is from the Community Reinvestment Act Small Business Lending Dataset

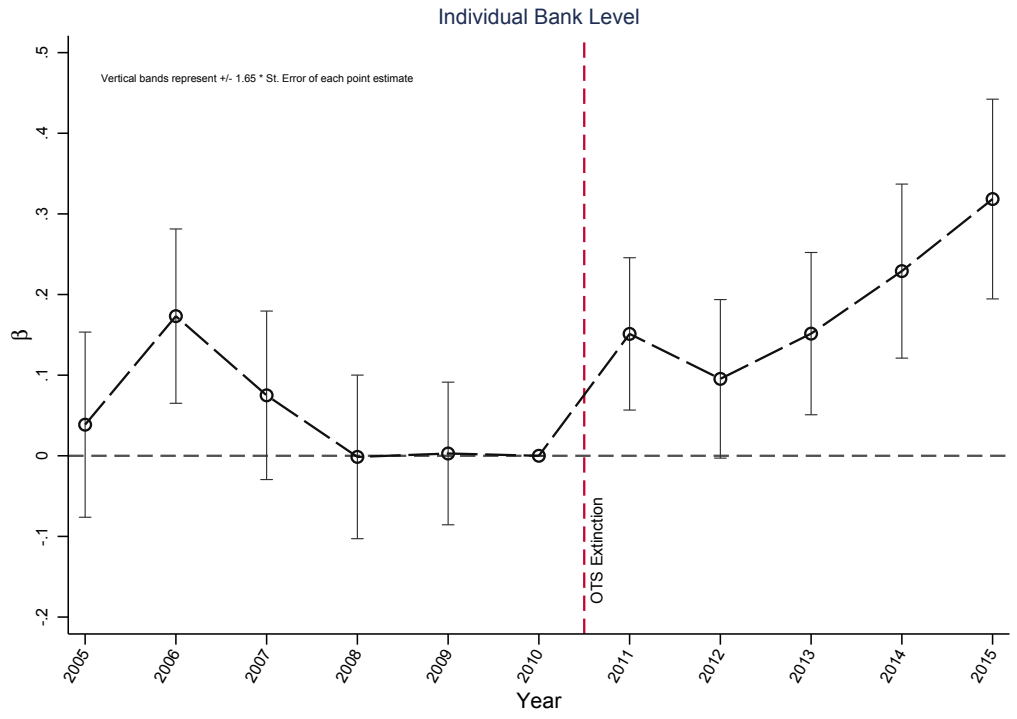

Figure 6: Geographic Distribution of OTS Deposit Share

Figure 6 represents the fraction of total bank deposits in a county accounted for by depository institutions whose primary regulator was the OTS in 2010. Data on branch deposits of OTS banks is from the Federal Deposit Insurance Corporation's Summary of Deposits Database.

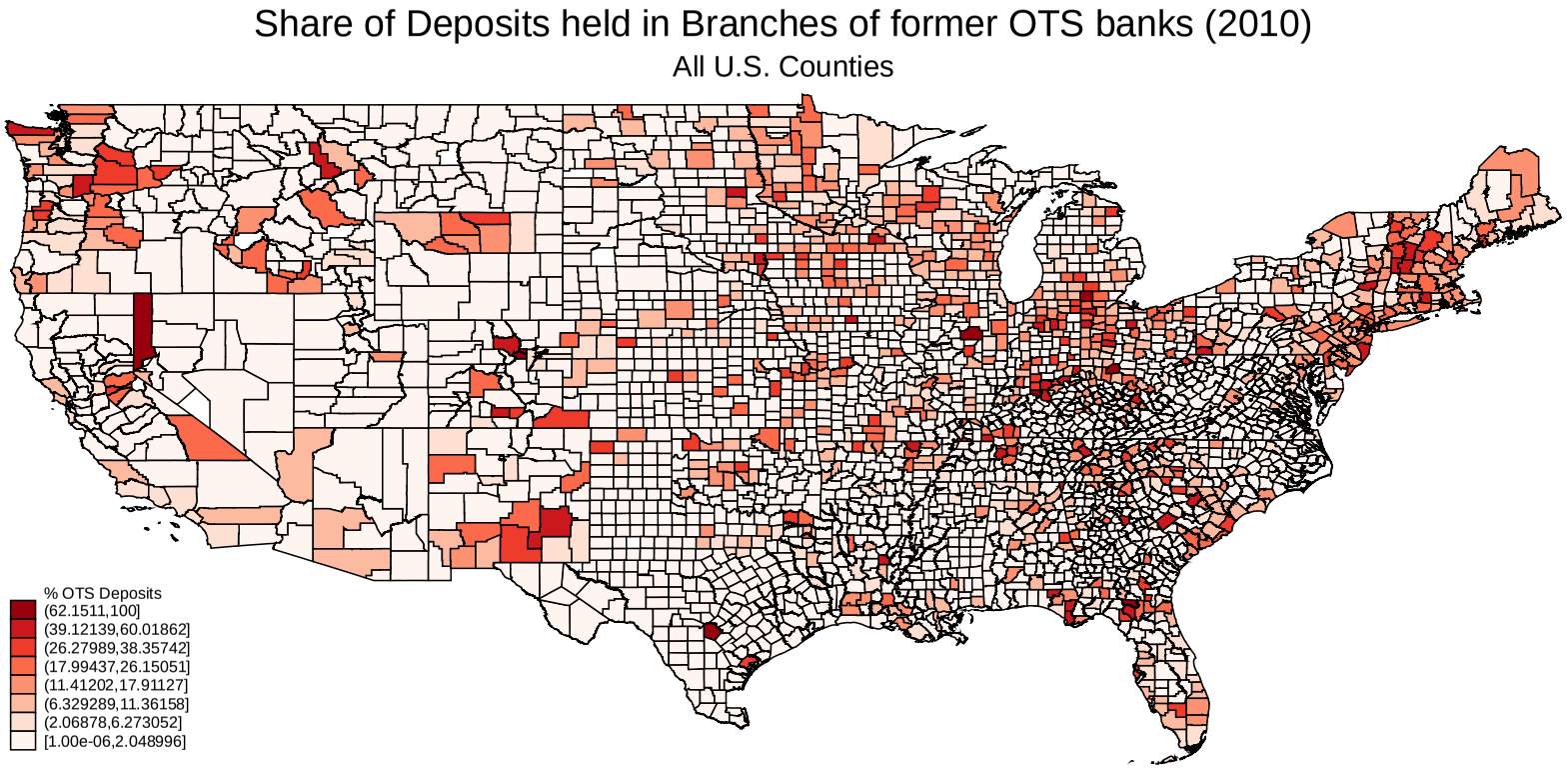

Figure 7: OTS Extinction and Business Entry and Exit Rates: Impact over Time

Figure 7 plots the average impact of exposure to OTS commercial banks on entry and exit of (business) establishments at the county level in each year of the sample period. In the left figure, the shallow circles represent the series of coefficients β_t from expanding the model specification in column (2) of Table 8 to include a set of interaction variables between year dummies and the share of deposits held in former OTS institution in each county as of June 30th, 2010. and the vertical bands represent 90% confidence intervals for the point estimates in each quarter. In the right figure, the shallow circles represent the series of coefficients β_t from expanding the model specification in column (4) of Table 8 to include a set of interaction variables between year dummies and the share of deposits held in former OTS institution in each county as of June 30th, 2010. Data on entry and exit of businesses at the county level is from the Census Bureau's Statistics of US Businesses and data on the share of deposits in former OTS institutions is from the FDIC's Summary of Deposits.

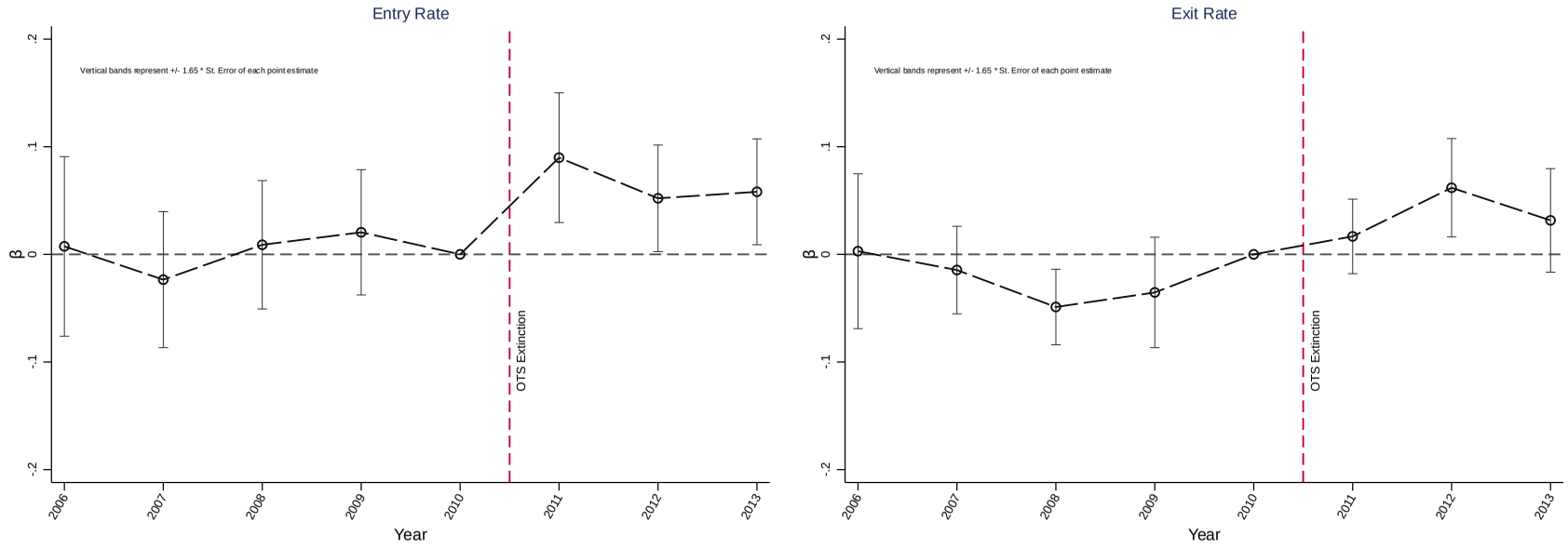

Table 1: Transition Matrix of Former OTS Banks

Table 1 reports on the status of former OTS banks that mandatorily transitioned from the OTS to the OCC/FDIC following the OTS extinction on July 21st, 2011. The Table shows how many former OTS banks voluntarily changed to other charters as of June 30th of the subsequent years and how many former OTS banks dropped out of the sample due to failure, merger, or closure. We also report a similar migration analysis to the control group of commercial banks.

	Former - OTS Banks								**Commercial Banks**				
	Mandatory Transition from OTS to OCC/FDIC on 07/21/2011	Voluntary change to different Regulator or institution class after OTS extinction:					Drop out		Commercial banks supervised by OCC or FDIC	Voluntary change to other regulator		Drop out	
Date	708 OTS regulated Banks required to switch to OCC or FDIC regulator	Change from OCC to FDIC - Mutual Savings Bank	Change to OCC - Commercial Bank	Change to FDIC - Commercial Bank	Change to FRB Commercial or Savings Banks	% of voluntary changes within each year	Cumulative number of banks that Failed, Merged, or Closed	% of drop out within each year	OCC - Federal Charter	FRB Commercial or Saving Banks	% of voluntary changes within each year	Cumulative number of banks that Failed, Merged, or Closed	% of drop out within each year
6/30/2011	708	0	0	0	0				5590	0		0	
6/30/2012	633	16	5	17	6	6.02%	32	4.38%	5361	35	0.63%	194	3.47%
6/30/2013	579	27	6	24	9	3.25%	63	4.73%	5093	67	0.62%	430	4.37%
6/30/2014	522	36	11	28	13	3.41%	98	5.43%	4845	106	0.82%	639	4.05%
6/30/2015	480	35	15	34	19	2.45%	125	4.43%	4586	133	0.63%	871	4.69%
% of banks 06/30/2015 Compared to 6/30/2011	67.80%	4.94%	2.12%	4.80%	2.68%		17.66%		82.04%	2.38%		15.58%	

Table 2: Descriptive Statistics for Sample Banks

Table 2 presents descriptive statistics of the main sample used in the analysis. Panel A presents financial characteristics and ratios of the entire sample of banks using call report and thrift financial report data. Panel B reports summary statistics for the sample of Community Reinvestment Act (CRA) Small Business Lending reporting banks. *Total Assets* are total assets of the depository institution (measured in $000s) (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Loan Loss Provision Ratio* is defined as the ratio between Loan Loss Provisions (RIAD4230) and total assets (RCFD2170). *Charge-Off Ratio* is the ratio of total charge-offs (RIAD435) and total assets (RCFD2170). *Nonperforming Loan Ratio* is defined as the sum of total loans that are 90 days past due and still accruing (RCFD1407) and total nonaccrual loans (RCFD1407) divided by total assets (RCFD2170). *ALLL Ratio* is the ratio of the Allowance for loan and Lease Losses (RIAD3123) and total assets (RCFD2170). *Total SBL Originations* is the total amount of small business loans (measured in $000s) originated by a bank over a calendar year. *Number Branches* is the total number of branches operated by a bank as of June 30th of each year. *Total Deposits* is the total deposits held in domestic branches of a bank as of June 30th of each year (measured in $000s). *HPI* is the average of the HPI of each zip code where the bank has a branch weighted by the share of county deposits that the bank holds in that zip code. The zipcode HPI is calculated using the all-transactions indexes at the zip code level provided by the Federal Housing Finance Agency.

Panel A: Financial Characteristics and Ratios

	Count	Mean	Std. Dev.	p25	p50	p75
Commercial Banks						
Total Assets	276,222	1,980,338	31,310,266	66,037	142,466	337,932
Share CRE	265,682	0.233	0.170	0.091	0.207	0.346
Share C&I	273,895	0.095	0.0885	0.041	0.075	0.122
Share Residential	265,682	0.17	0.129	0.082	0.151	0.234
Tier1 Capital Ratio	265,681	22.27	120.3	11.27	13.91	18.48
Loan Loss Provision Ratio	267,250	0.0011	0.00369	0	0.00034	0.00096
Charge-Off Ratio	265,680	0.0011	0.00350	0	0.00020	0.00084
Nonperforming Loan Ratio	273,827	0.012	0.0197	0.0013	0.0056	0.0145
ALLL Ratio	264,776	0.010	0.0069	0.0064	0.0087	0.0116
Former OTS Banks						
Total Assets	24,689	1,175,943	5,858,742	79,662	167,900	427,344
Share CRE	24,689	0.172	0.152	0.050	0.137	0.258
Share C&I	24,689	0.033	0.051	0	0.012	0.048
Share Residential	24,689	0.418	0.209	0.271	0.426	0.568
Tier1 Capital Ratio	24,689	29.63	66.96	13.61	18.38	28.13
Loan Loss Provision Ratio	24,689	0.0010	0.00313	0	0.00021	0.00081
Charge-Off Ratio	24,688	0.0009	0.0026	0	0.00009	0.00067
Nonperforming Loan Ratio	24,689	0.013	0.0210	0.0017	0.0064	0.0164
ALLL Ratio	22,486	0.007	0.0067	0.0031	0.0058	0.0091

Panel B: Small Business Loan and Deposit Market Characteristics of CRA Reporting Banks

	Count	Mean	Std. Dev.	p25	p50	p75
Commercial Banks						
Total SBL Originations	8,505	214,504	963,641	21,938	55,692	125,576
Number Branches	8,505	350.6	1,626.7	36	74	173
Total Assets	8,505	4,138,426,192	54,375,080,904	1,642,812	5,828,784	28,301,078
Total Deposits	8,505	7,741,388	51,713,920	515,872	1,023,661	2,192,585
HPI	8,298	1.114	0.137	1.039	1.107	1.189
Former OTS Banks						
Total SBL Originations	668	56,886	115,515	5,302	24,070	59,403
Number Branches	668	275.3	639.0	55	111	213
Total Assets	668	132,904,676	687,671,861	4,068,040	10,161,059	34,254,948
Total Deposits	668	3,666,661	7,167,811	928,023	1,343,974	2,987,659
HPI	646	1.094	0.143	1.002	1.090	1.182

Table 3: OTS Extinction and Loan Loss Recognition: Impact of Stricter Supervision

Table 3 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on loan loss recognition. The dependent variables are the *Loan Loss Provision Ratio*, *Nonperforming Loan Ratio*, *Charge-Off Ratio*, and *ALLL Ratio*. *Loan Loss Provision Ratio* is defined as the ratio between Loan Loss Provisions (RIAD4230) and total assets (RCFD2170). *Nonperforming Loan Ratio* is defined as the sum of total loans that are 90 days past due and still accruing (RCFD1407) and total nonaccrual loans (RCFD1407) divided by total assets (RCFD2170). *Charge-Off Ratio* is the ratio of total charge-offs (RIAD435) and total assets (RCFD2170). *ALLL Ratio* is the ratio of the Allowance for loan and Lease Losses (RIAD3123) and total assets (RCFD2170). *OTS* is an indicator variable that takes the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all quarters after 2011Q3 (inclusive). *Ln(Assets)* is the natural logarithm of total assets (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Tier1 Capital Ratio* is the Tier 1 capital ratio of the financial institution (RCFD7206). Standard errors are presented in parentheses, and are clustered at the level of the bank's county headquarters. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Loan Loss Provision Ratio		Nonperforming Loan Ratio		Charge-Off Ratio		ALLL Ratio	
OTS × Post	0.018***	0.018***	0.333***	0.369***	0.023***	0.026***	0.168***	0.177***
	(0.004)	(0.004)	(0.044)	(0.044)	(0.003)	(0.003)	(0.018)	(0.018)
Ln(Assets)		0.004		-0.004		0.011***		-0.097***
		(0.003)		(0.032)		(0.003)		(0.013)
Residential Share		0.020		1.279***		0.055***		0.839***
		(0.017)		(0.186)		(0.015)		(0.060)
C&I Share		0.142***		-0.807***		-0.057***		0.432***
		(0.022)		(0.226)		(0.022)		(0.079)
CRE Share		0.111***		0.174		-0.057***		0.696***
		(0.012)		(0.154)		(0.014)		(0.061)
Tier1 Capital Ratio		0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
Observations	341114	339103	347689	339103	339544	339101	339078	337084
Adjusted R^2	0.293	0.293	0.508	0.510	0.303	0.303	0.631	0.635
Quarter Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4: OTS Extinction, Enforcement Actions, and Changes in Bank Management

Table 4 reports the coefficients of OLS regressions investigating the direct effect of the OTS extinction on *Enf. Act.*, *Board Turnover*, *Exec. Exit*, and *Risk Models*. *Enf. Act* is an indicator variable if the bank received a cease and desist or a consent order during the quarter. *Board Turnover* is the ratio between the number of entries and exits in the board of the bank and the average number of board members over the year. *Exec. Exit* is an indicator variable that takes the value of one if an executive director of the bank exits during the year. *Risk Models* is an indicator variable that takes the value of one if the annual report of the bank mentions the words "risk" and "model" within ten words of each other. *OTS* is an indicator variable that takes the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all quarters after 2011Q3 (inclusive). *Ln(Assets)* is the natural logarithm of total assets (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Tier1 Capital Ratio* is the Tier 1 capital ratio of the financial institution (RCFD7206). The specifications (3)–(8) use a dataset specified at an annual frequency. In these specifications, all ratios are computed as of the fourth quarter of the year. We control for the board size non-parametrically by including board size fixed-effects in equations (3)–(6) and we also control for the natural logarithm of number of words in the 10-K in columns (7) and (8). Standard errors are presented in parentheses, and are clustered at the level of the bank's county headquarters. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Enf. Act.		Board Turnover		Exec. Exit		Risk Models	
OTS × Post	0.003*	0.003**	0.021***	0.021**	0.041*	0.042*	0.076	0.084*
	(0.001)	(0.001)	(0.008)	(0.008)	(0.021)	(0.022)	(0.052)	(0.050)
Ln(Assets)		0.005***		-0.003		-0.008		0.074**
		(0.001)		(0.009)		(0.025)		(0.031)
Residential Share		0.003		-0.045		-0.121		-0.364*
		(0.004)		(0.049)		(0.139)		(0.189)
CRE Share		-0.005		-0.128***		-0.319**		0.001
		(0.003)		(0.038)		(0.125)		(0.178)
C&I Share		-0.013**		0.056		-0.065		-0.143
		(0.005)		(0.067)		(0.207)		(0.327)
Tier1 Capital Ratio		-0.000		-0.001*		-0.004**		0.000
		(0.000)		(0.000)		(0.002)		(0.000)
Observations	350122	339104	3429	3403	3429	3403	3735	3694
Adjusted R^2	0.017	0.016	0.073	0.074	0.038	0.033	0.669	0.671
Quarter Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5: OTS Extinction and Small Business Lending

Table 5 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on the supply of small business lending by former OTS banks. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). *Ln(HPI)* is the natural logarithm of a house price index (HPI) calculated for each bank and each county where that bank has a branch network presence. The HPI is calculated using the all-transactions indexes at the zip code level provided by the Federal Housing Finance Agency. We calculate the HPI for each bank in each county by weighting the HPI of each zip code where the bank has a branch by the share of county deposits that the bank holds in that zip code. The index is designed to capture potential and absorb potential systematic differences in the location strategies of former OTS and commercial banks within a county location. Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(Total Loans)					
OTS × Post	0.206***	0.088**	0.152***	0.204***	0.094**	0.158***
	(0.041)	(0.039)	(0.041)	(0.041)	(0.039)	(0.042)
Ln(HPI)				0.266***	0.206	0.450**
				(0.041)	(0.159)	(0.203)
Observations	139277	130989	116550	129310	123123	109740
Adjusted R^2	0.755	0.864	0.881	0.754	0.865	0.883
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No	Yes	No	No
County Fixed Effects	Yes	No	No	Yes	No	No
Bank Fixed Effects	Yes	No	No	Yes	No	No
County-Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Bank-County Fixed Effects	No	Yes	Yes	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes	No	No	Yes

Table 6: OTS Extinction and Small Business Lending: Portfolio Reallocation

Table 6 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on small business lending after partitioning the sample based on indicators of the supply of credit in the mortgage lending market. Columns (1) and (2) repeat the empirical specification of column (2) in Table 5 after stratifying the sample based on the median exposure to residential loans in 2010. Columns (3) and (4) repeat the empirical specification of column (2) in Table 5 after stratifying the sample based on median of a proxy for the expansion in the supply of credit in the mortgage lending market in the years that followed the OTS extinction. We measure the expansion in the bank supply of mortgage lending between year t and year *t-1* as the bank fixed effect α_i in the following specification: $\Delta Mort.Vol_{ic} = \alpha_i + \gamma_c + \epsilon_{ict}$, where $\Delta Mort.Vol_{ic}$ is the change in mortgage loans originated by bank i in census tract c during year t and γ_c are census tract fixed effects that control for demand factors at census tract level. Columns (5) and (6) repeat the empirical specification of column (2) in Table 5 after stratifying the sample based on whether the change in the average rejection rate of mortgage loan applications between 2012 and 2010 was positive or negative. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
			Ln(Total Loans)			
	Low Share Res. 2010	Hi. Share Res. 2010	Low Supply Mort.	Hi. Supply Mort.	Neg. Δ Rej	Pos. Δ Rej
OTS $\times$ Post	0.047	0.035	-0.204**	0.159***	0.261***	0.011
	(0.082)	(0.051)	(0.087)	(0.046)	(0.063)	(0.064)
Observations	54447	50853	53370	52946	67774	29381
Adjusted R^2	0.876	0.846	0.867	0.857	0.862	0.870
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: OTS Extinction and Small Business Lending: Role of Capitalization, Loan Loss Recognition and OCC Supervision

Table 7 reports the coefficients of OLS regressions. Columns (1) and (2) repeat the analysis of column (2) of Table 5 after stratifying the sample based on above- and below-median levels of Tier1 Capital Ratio of the former OTS banks subsample prior to the OTS extinction. Columns (3) and (4) repeat the analysis of column (2) of Table 5 after stratifying the sample based on above- and below-average changes between the loan loss provisions recorded in the four quarters that followed and the four quarters that preceded the OTS extinction. Columns (5) and (6) repeat the analysis of column (2) of Table 5 after stratifying the sample based on above- and below-median distance of the headquarters of the bank to the closest OCC field office. Columns (7) and (8) repeat the analysis of column (2) of Table 5 after stratifying the sample based on whether an executive director of the bank left the company. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ln(Total Loans)							
	Hi Tier1	Low Tier1	Hi Δ Prov.	Low Δ Prov.	Low Dist OCC	Hi Dist OCC	No Exec. Exit	Exec. Exit
OTS × Post	0.265***	-0.227***	0.181***	0.060	0.251***	0.018	0.073	0.806***
	(0.061)	(0.070)	(0.070)	(0.061)	(0.068)	(0.050)	(0.087)	(0.261)
Observations	19197	88309	29398	73587	54655	65128	27217	1691
Adjusted R^2	0.838	0.868	0.849	0.866	0.878	0.850	0.865	0.800
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: OTS Extinction and Entry and Exit of Local Business Establishments

Panel A of Table 8 reports the coefficients of OLS and WLS regressions. The specifications columns (2) and (4) present coefficients from specification where each county observation is weighted by the total employment in that county. The dependent variable in columns (1) and (2), *Ln(Entry Rate)*, is the natural logarithm of the entry rate of new establishments in a given county and year. Entry rate is the ratio between the number of new establishments and the number of existing establishments at the beginning of the year. The dependent variable in columns (3) and (4), *Ln(Exit Rate)*, is the natural logarithm of the exit rate of establishment in a given county and year. Exit rate is defined as the ratio between the number of establishment that exit the market and the total number of establishments at the beginning of the year. *Share OTS* is the share of county deposits held in former OTS institution as of June 30th, 2010. *Post* is an indicator variable that takes the value of one for all year after 2011 (inclusive). Baseline controls include linear and quadratic terms for the total number of branches and total amount of deposits held in each county and controls for the logarithm of the number of establishments in the county that employ 1–4, 5–9, 10–19, 20–49, 50–99, 100–249, 250–499 people, and total number of establishments in the county. Panel B repeats the analysis after stratifying the sample based on above- and below-median levels of the percentage change in the aggregate amount of small business loans originated in a county between 2010 and 2012. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Baseline Specification

	(1)	(2)	(3)	(4)
	Ln(Entry Rate)		Ln(Exit Rate)	
Share OTS × Post	0.055*	0.064**	0.090***	0.056**
	(0.031)	(0.025)	(0.026)	(0.022)
Observations	9,593	9,593	9,593	9,593
Adjusted R-squared	0.792	0.936	0.738	0.919
Baseline Controls	Yes	Yes	Yes	Yes
Employment Weighted	No	Yes	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
County Fixed Effects	Yes	Yes	Yes	Yes

Panel B: Heterogeneity based on Aggregate Lending Changes

	High Δ SBL		Low Δ SBL		High Δ SBL		Low Δ SBL	
	Ln(Entry Rate)				Ln(Exit Rate)			
Share OTS × Post	0.103**	0.073***	0.010	0.029	0.135***	0.074**	0.053	0.041
	(0.043)	(0.025)	(0.043)	(0.052)	(0.036)	(0.030)	(0.037)	(0.038)
Observations	4800	4800	4794	4793	4800	4800	4794	4793
Adjusted R^2	0.796	0.937	0.788	0.935	0.751	0.923	0.724	0.916
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Employment Weighted	No	Yes	No	Yes	No	Yes	No	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: OTS Extinction, Entry and Exit and Dependence from External Sources of Finance

Table 9 reports the coefficients of WLS regressions in which each observation is weighted by the total employment in that county. The dependent variable in columns (1) and (2), *Ln(Entry Rate)*, is the natural logarithm of the entry rate of new establishments in a given county and year. Entry rate is the ratio between the number of new establishments and the number of existing establishments at the beginning of the year. The dependent variable in columns (3) and (4), *Ln(Exit Rate)*, is the natural logarithm of the exit rate of establishment in a given county and year. Exit rate is defined as the ratio between the number of establishment that exit the market and the total number of establishments at the beginning of the year. The models of specifications (1) and (3) use entry and exit rates in the subset of 2-digit NAICS industries with high dependence of external sources of finance and the models of specifications (2) and (4) use entry and exit rates in the subset of 2-digit NAICS industries with low dependence of external sources of finance. Industries are classified as high/low dependence on external sources of finance based on their above/below-median use of external financial capital according to the Census Bureau's 2010 Survey of Business Owners. We define external capital to include bank and government loans, loans from family and friends, credit cards, venture capital investment or grants and only consider employer firms in the Survey of Business Owners dataset. *Share OTS* is the share of county deposits held in former OTS institution as of June 30th, 2010. *Post* is an indicator variable that takes the value of one for all year after 2011 (inclusive). Baseline controls include linear and quadratic terms for the total number of branches and total amount of deposits held in each county and controls for the logarithm of the number of establishments in the county that employ 1–4, 5–9, 10–19, 20–49, 50–99, 100–249, 250–499 people, and total number of establishments in the county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, repr esent statistical significance at 1%, 5%, and 10% levels, respectively.

	Hi Ext. Fin.	Low Ext. Fin.	Hi Ext. Fin.	Low Ext. Fin.
	Ln(Entry Rate)		Ln(Exit Rate)	
Share OTS × Post	0.096**	0.033	0.060**	0.056**
	(0.040)	(0.023)	(0.025)	(0.024)
Observations	8381	8388	8385	8392
Adjusted R^2	0.786	0.856	0.744	0.842
Baseline Controls	Yes	Yes	Yes	Yes
Employment Weighted	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
County Fixed Effects	Yes	Yes	Yes	Yes

Online Appendix for "The Death of a Regulator: Strict Supervision, Bank Lending, and Business Activity"

A Table of Contents:

Figure OA.1: Example passages from OCC Enforcement Action on Former OTS

In this appendix, we show passages from OCC Enforcement Actions and formal written agreements between the OCC and former OTS banks. Panel A shows the third section of the formal written agreement between the OCC and Delanco Federal Savings Bank of November 21st, 2012 requiring Delanco's Board to ensure competent management by means of hiring new managers or providing additional training to existing managers that continue in their position. Panel B shows shows the sixth section of the formal written agreement between the OCC and Amory Federal Savings & Loans Association of July 19th, 2012 requiring Amory's management to implement new loan portfolio management practices. Panel C shows shows the sixth section of the formal written agreement between the OCC and Community Bank, Staunton, Virginia of August 9th, 2012 requiring Community Bank's management to implement new credit risk management practices.

Panel A: Formal Written Agreement between OCC and Delanco, FSB.

ARTICLE III

BOARD TO ENSURE COMPETENT MANAGEMENT

(1) The Board shall ensure that the Bank has competent management in place on a full-time basis in its Chief Executive Officer, Chief Financial Officer, and Vice President of Commercial Lending positions to carry out the Board's policies, ensure compliance with this Agreement, applicable laws, rules and regulations, and manage the day-to-day operations of the Bank in a safe and sound manner.

(4) If the Board determines that an officer will continue in his/her position but that the officer's depth of skills needs improvement, the Board will within sixty (60) days develop and implement a written program, with specific time frames, to improve the officer's supervision and management of the Bank. At a minimum, the written program shall include:

(a) an education program designed to ensure that the officer has skills and abilities necessary to supervise effectively;

Panel B: Formal Written Agreement between OCC and Amory Federal Savings & Loans Association.

ARTICLE VI

LOAN PORTFOLIO MANAGEMENT

(1) The Board shall, within sixty (60) days, develop, implement, and thereafter ensure Bank adherence to a written program to improve the Bank's loan portfolio management. The program shall include, but not be limited to:

(a) procedures to ensure satisfactory and perfected collateral documentation;

(b) procedures to ensure that extensions of credit are granted, by renewal or otherwise, to any borrower only after obtaining and analyzing current and satisfactory credit information;

Panel C: Formal Written Agreement between OCC and Community Bank, Staunton,Virginia.

Article VI

CREDIT RISK MANAGEMENT

(1) Within sixty (60) days, the Board shall develop, implement, and thereafter ensure Bank adherence to a written program to improve the Bank's credit risk management consistent with the guidance set forth in the OCC Handbook "Rating Credit Risk". The program shall include, but not be limited to:

(a) procedures to ensure accurate and timely risk grades, including loss recognition and identification of nonaccrual loans;

(b) procedures for early problem loan identification;

(c) procedures for establishing loan officer and credit administration accountability for failure to assign accurate and timely risk grades on loans, including recognition of nonaccrual status under their respective supervision;

(d) implementation of an effective credit risk training program for all lending staff, internal loan review staff, financial analysts, and members of the Directors Loan Committee;

(e) stress testing of higher risk loan concentration categories (non-owner occupied, commercial real estate (CRE), land, and construction loans),

Figure OA.2: Small Business Lending and OTS Extinction: Estimated Impact over Time in the Census Tract sample

Figure OA.2 plots the average impact of OTS supervision on small business lending in each year of the sample period. The shallow circles represent the series of coefficients β_t from expanding the model specification in column (2) of Table OA.4 to include a set of interaction variables between year dummies and the share of deposits held in former OTS institution in each census tract as of June 30th, 2010. Data on small business lending is from the Community Reinvestment Act Small Business Lending Dataset

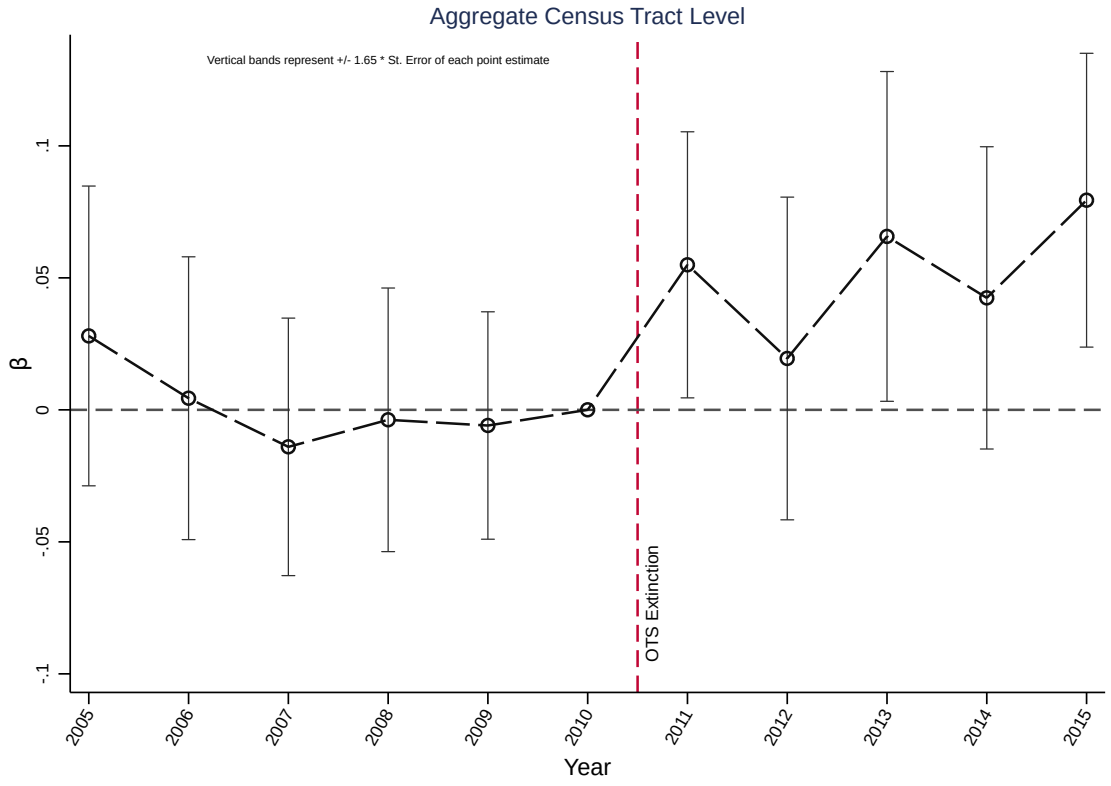

Figure OA.3: OTS Extinction and Mortgage Lending (Census Tract): Estimated Impact over Time

Figure OA.3 plots the average impact of OTS supervision on mortgage lending in each year of the sample period. The shallow circles represent the series of coefficients β_t from expanding the model specification in column (4) of Table OA.11 to include a set of interaction variables between year dummies and a dummy variable taking the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision and the vertical bands represent 90% confidence intervals for the point estimates in each quarter.

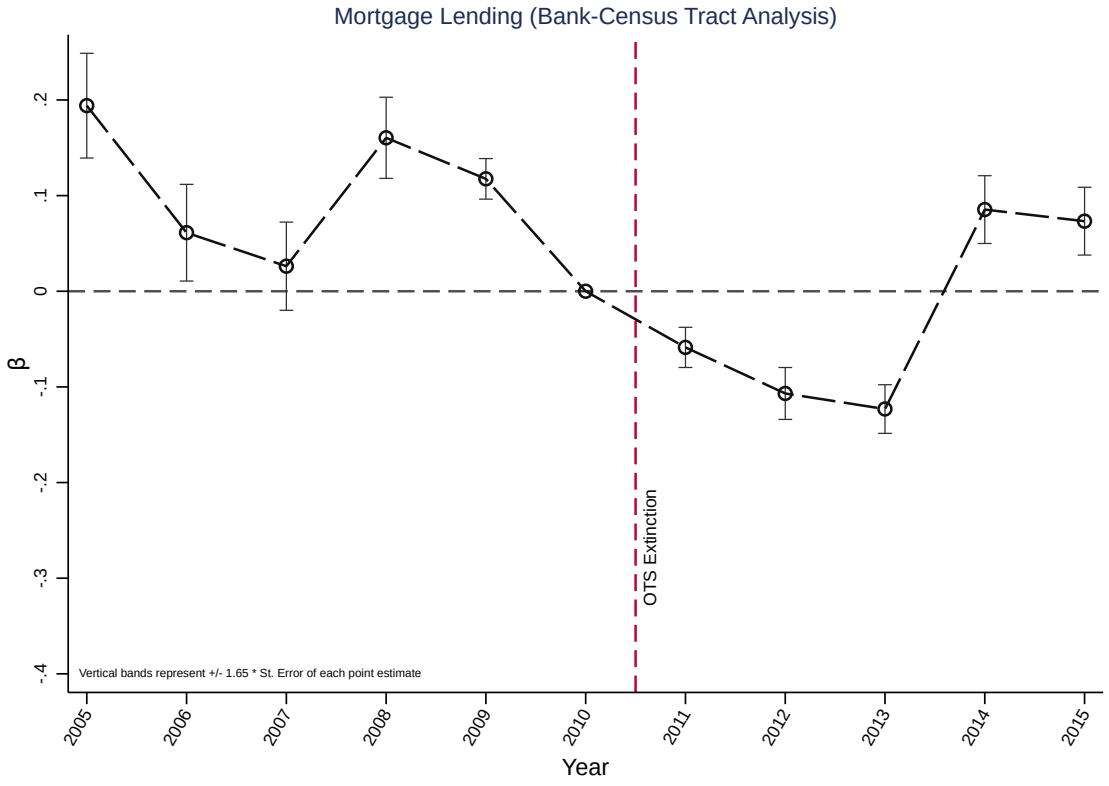

Figure OA.4: OTS Extinction and Mortgage Lending (Likelihood of Application Rejection): Impact over Time

Figure OA.4 plots the average impact of OTS supervision on the rejection rate of mortgage loans in each year of the sample period. The shallow circles represent the series of coefficients β_t from the following model specification: $Reject_{ibct} = \alpha_{bc} + \gamma_{ct} + \delta X_i + \sum_t \beta_t OTS_b \times Year_t + \epsilon_t$, where i indexes for the mortgage application i in census tract c to bank b during year t. The vector X_i includes a number of characteristics of the applicantion, namely loan occupancy status, property type, lien status, loan-to-income ratio, applicant's ethnicity, and applicant's race. OTS is an indicator variable that takes the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision and the vertical bands represent 90% confidence intervals for the point estimates in each quarter. *Year* is a series of indicator variables that takes the value of one for each year between 2005 and 2015.

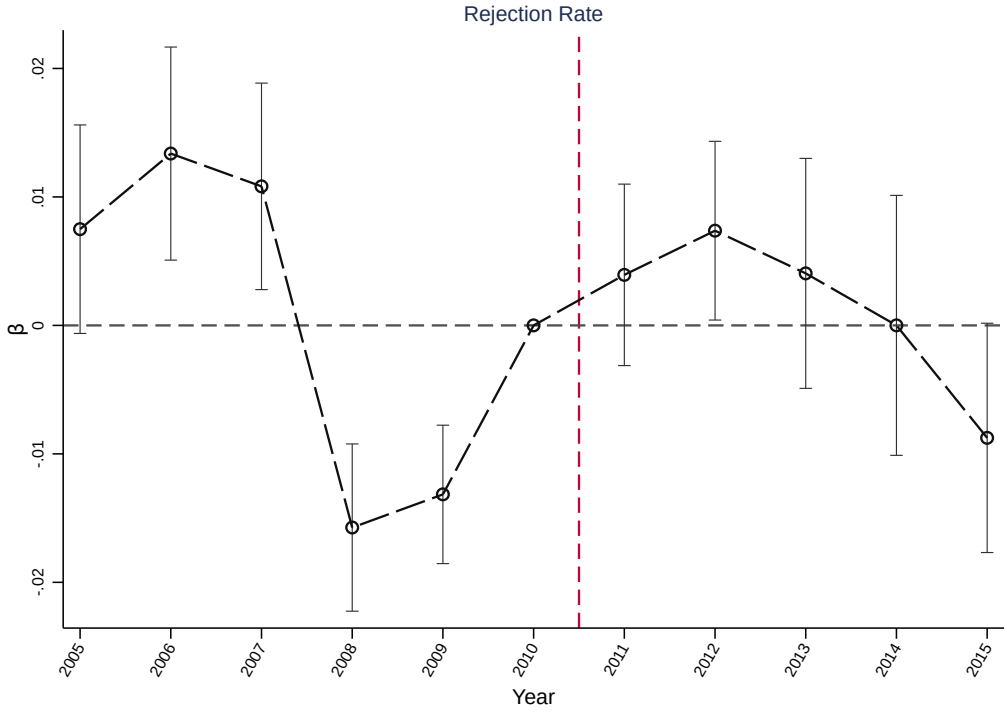

Table OA.1: OTS Extinction and Loan Loss Recognition - Transition to OCC or FDIC

Table OA.1 reports the coefficients of OLS regressions investigating whether the effect of the OTS extinction on loan loss recognition depends on whether the new regulator of the former OTS banks was the OCC or the FDIC. The dependent variables are the *Loan Loss Provision Ratio*, *Nonperforming Loan Ratio*, *Charge-Off Ratio*, and *ALLL Ratio*. *Loan Loss Provision Ratio* is defined as the ratio between Loan Loss Provisions (RIAD4230) and total assets (RCFD2170). *Nonperforming Loan Ratio* is defined as the sum of total loans that are 90 days past due and still accruing (RCFD1407) and total nonaccrual loans (RCFD1407) divided by total assets (RCFD2170). *Charge-Off Ratio* is the ratio of total charge-offs (RIAD435) and total assets (RCFD2170). *ALLL Ratio* is the ratio of the Allowance for loan and Lease Losses (RIAD3123) and total assets (RCFD2170). *OTS* $\rightarrow$ *OCC* is an indicator variable that takes the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision and it transitioned to the OCC following the OTS extinction. *OTS* $\rightarrow$ *FDIC* is an indicator variable that takes the value of one if the depository institution's primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision and it transitioned to the FDIC following the OTS extinction. *Post* is an indicator variable that takes the value of one for all quarters after 2011Q3 (inclusive). *Ln(Assets)* is the natural logarithm of total assets (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Tier1 Capital Ratio* is the Tier 1 capital ratio of the financial institution (RCFD7206). Standard errors are presented in parentheses, and are clustered at the level of the bank's county headquarters. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Loan Loss Provision Ratio	Nonperforming Loan Ratio	Charge-Off Ratio	ALLL Ratio
OTS $\rightarrow$ OCC $\times$ Post	0.016***	0.392***	0.026***	0.182***
	(0.004)	(0.043)	(0.004)	(0.019)
OTS $\rightarrow$ FDIC $\times$ Post	0.041***	0.075	0.026***	0.094**
	(0.006)	(0.131)	(0.006)	(0.043)
Ln(Assets)	0.003	-0.022	0.011***	-0.105***
	(0.003)	(0.031)	(0.003)	(0.014)
Residential Share	0.013	1.216***	0.046***	0.820***
	(0.016)	(0.177)	(0.014)	(0.060)
CRE Share	0.137***	0.432***	-0.025**	0.739***
	(0.011)	(0.143)	(0.012)	(0.064)
C&I Share	0.169***	-0.610***	-0.031	0.472***
	(0.019)	(0.209)	(0.020)	(0.079)
Tier1 Capital Ratio	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	312177	312177	312175	310264
Adjusted R^2	0.278	0.514	0.300	0.636
Quarter Fixed-Effects	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes

Table OA.2: OTS Extinction and Strict Supervision: The Role of Local Economic Conditions

Table OA.2 reports the coefficients of OLS regressions investigating whether the effect of the OTS extinction depends on the exposure of the bank to areas with significant house price decline in the 2007–2010 period. We stratify the sample based on a bank-specific measure of exposure to house price declines in the 2007-2010 period. The house price decline measure is computed as the weighted average on the house price declines in the counties where banks have a branch presence and the weighted are defined by the share of deposits of each bank in the county in 2007. The Hi. HPI decline sample is defined as banks whose weighted house price index fell by more than 17% between 2007 and 2010. The Med. HPI decline sample is comprised of banks whose weighted house price index fell between two and seventeen percent between 2007 and 2010. The Low HPI decline sample are those banks whose weighted house price index either rose or fell less than two percent between 2007 and 2010. The dependent variables are the *Nonperforming Loan Ratio* and *Enf. Act. Nonperforming Loan Ratio* is defined as the sum of total loans that are 90 days past due and still accruing (RCFD1407) and total nonaccrual loans (RCFD1407) divided by total assets (RCFD2170). *Enf. Act.* is an indicator variable if the bank received a cease and desist or a consent order during the quarter. *Post* is an indicator variable that takes the value of one for all quarters after 2011Q3 (inclusive). *Ln(Assets)* is the natural logarithm of total assets (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Tier1 Capital Ratio* is the Tier 1 capital ratio of the financial institution (RCFD7206). Standard errors are presented in parentheses, and are clustered at the level of the bank's county headquarters. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	Nonperforming Loan Ratio			Enf. Act.		
	Hi. HPI Shock	Med. HPI Shock	Low HPI Shock	Hi. HPI Shock	Med. HPI Shock	Low HPI Shock
OTS × Post	0.383***	0.227***	0.305***	0.008***	0.000	0.004***
	(0.052)	(0.021)	(0.024)	(0.001)	(0.000)	(0.001)
Ln(Assets)	-0.055	-0.023	-0.080	0.005***	0.003**	0.004**
	(0.057)	(0.052)	(0.057)	(0.001)	(0.001)	(0.002)
Residential Share	1.675***	0.750***	0.599**	0.011	-0.006	0.007
	(0.388)	(0.183)	(0.255)	(0.009)	(0.004)	(0.007)
CRE Share	0.828***	0.392**	0.611**	0.001	0.005	-0.000
	(0.270)	(0.164)	(0.260)	(0.006)	(0.004)	(0.006)
C&I Share	-1.161***	-0.788**	0.439	-0.020	0.001	0.002
	(0.422)	(0.309)	(0.324)	(0.013)	(0.008)	(0.009)
Tier1 Capital Ratio	-0.000	-0.000	-0.003***	-0.000	-0.000	-0.000**
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Observations	68359	137036	68692	68359	137036	68693
Adjusted R^2	0.561	0.515	0.476	0.016	0.013	0.008
Quarter Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table OA.3: OTS Extinction and Strict Supervision: Heterogeneity across OTS Divisions

Table OA.3 reports the coefficients of OLS regressions investigating whether the effect of the OTS extinction varies across the different OTS regional divisions. We stratify the sample based on whether the headquarters of the bank is located in one of the states covered by the West regional division of the OTS. The dependent variables are the *Nonperforming Loan Ratio* and *Enf. Act. Nonperforming Loan Ratio* is defined as the sum of total loans that are 90 days past due and still accruing (RCFD1407) and total nonaccrual loans (RCFD1407) divided by total assets (RCFD2170). *Enf. Act.* is an indicator variable if the bank received a cease and desist or a consent order during the quarter. *Post* is an indicator variable that takes the value of one for all quarters after 2011Q3 (inclusive). *Ln(Assets)* is the natural logarithm of total assets (RCFD2170). *Share Residential* is the ratio of residential real estate loans (RCON1797+RCON5367+RCON5368) and total assets (RCFD2170). *Share C&I* is the ratio of commercial and industrial loans (RCFD1766) and total assets (RCFD2170). *Share CRE* is the ratio of commercial and real estate loans (RCON1415+RCON1460+RCON1480+RCFD2746) and total assets (RCFD2170). *Tier1 Capital Ratio* is the Tier 1 capital ratio of the financial institution (RCFD7206). Standard errors are presented in parentheses, and are clustered at the level of the bank's county headquarters. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	Nonperforming Loan Ratio		Enf. Act.	
	Central & NE & SE	West	Central & NE & SE	West
OTS × Post	0.301***	0.421***	0.002***	0.005***
	(0.028)	(0.022)	(0.001)	(0.000)
Ln(Assets)	-0.008	0.003	0.003***	0.006***
	(0.064)	(0.046)	(0.001)	(0.001)
Residential Share	1.618***	0.944***	0.007*	-0.000
	(0.355)	(0.222)	(0.004)	(0.006)
CRE Share	0.079	0.059	-0.007*	-0.004
	(0.204)	(0.253)	(0.004)	(0.005)
C&I Share	-1.276***	-0.282	-0.008	-0.018**
	(0.329)	(0.336)	(0.007)	(0.007)
Tier1 Capital Ratio	-0.000	-0.000**	-0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	204938	136762	204938	136763
Adjusted R^2	0.529	0.472	0.016	0.018
Quarter Fixed-Effects	Yes	Yes	Yes	Yes
Bank Fixed-Effects	Yes	Yes	Yes	Yes

Table OA.4: OTS Extinction and Aggregate Small Business Lending by Census Tract

Table OA.4 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on small business lending at the census tract level. The dependent variable *Ln(Aggregate Total Loans by Tract)* is the aggregate total amount of small business loans (loans whose principal amount is below $1 million) originated by all depository institutions in a census tract over a calendar year. *Share OTS* is the share of deposits held in former OTS institution in each census tract as of June 30th, 2010. We map each branch in the Summary of Deposits (SOD) to its respective census tract using the Census Geocoder available in the United Census Bureau website. We drop 1,773 branch addresses that account for 1.15% of the total number of branches because their latitude and longitude data are missing or their address is improperly recorded. We use the census tract of each branch location to compute measures of the exposure of each census tract to former OTS banks. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). *Ln(HPI)* is the natural logarithm of a house price index (HPI) at the census tract level The HPI is calculated using the all-transactions indexes at the census tract level provided by the Federal Housing Finance Agency. Baseline controls include linear and quadratic terms for the total number of branches and total amount of deposits held in each census-tract. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Aggregate Total Loans by Tract)			
Share OTS × Post	0.054***	0.051***	0.046*	0.038*
	(0.021)	(0.019)	(0.024)	(0.022)
Ln(HPI)			0.424***	0.250***
			(0.025)	(0.031)
Observations	241,922	236,254	193,608	188,845
Adjusted R-squared	0.843	0.858	0.839	0.853
Baseline Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
County-Year Fixed Effects	No	Yes	No	Yes
Census Tract Fixed Effects	Yes	Yes	Yes	Yes

Table OA.5: Robustness - OTS Extinction and Small Business Lending Interaction with Size and Weighting Observations

Table OA.5 reports the coefficients of OLS regressions investigating the effect of the OTS extinction after controlling for the effects of bank size. Columns (1) and (2) report results after controlling for the total assets of banks and interactions of this variable. Columns (3) and (4) report coefficients of a WLS regression where each bank-county pair is weighted by the total amount of lending that a bank makes in the county during the sample period. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). *Ln(Total Assets)* is the natural logarithm of the total assets of the bank. Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Total Loans)			
OTS × Post	0.228***	0.135***	0.243***	0.162***
	(0.041)	(0.039)	(0.050)	(0.049)
Ln(Total Assets)	0.002	0.198***		
	(0.017)	(0.019)		
Post × Ln(Total Assets)	0.009***	0.008***		
	(0.003)	(0.003)		
Observations	137953	129393	139277	130989
Adjusted R^2	0.756	0.865	0.894	0.935
Baseline Controls	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes

Table OA.6: Robustness - OTS Extinction and Small Business Lending controlling for Top 4 Banks and TARP Recipient Banks

Table OA.6 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on the supply of small business lending by former OTS banks after conditioning on indicator variables representing whether the bank is among the top 4 banks in the United States and whether the bank received TARP funds. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). *Top 4* is an indicator variable that takes the value of one for the top 4 banks in the United States (Chen, Hanson, Stein, 2018) *TARP Recipient Bank* is an indicator variable that takes the value of one if the bank or its bank holding company received funds from the TARP program. Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(Total Loans)					
OTS × Post	0.233***	0.122***	0.152***	0.200***	0.079**	0.072*
	(0.041)	(0.039)	(0.041)	(0.041)	(0.039)	(0.043)
Top 4 × Post	0.155***	0.185***	0.040			
	(0.017)	(0.017)	(0.082)			
TARP Recipient Bank × Post				-0.010	-0.016	-0.157***
				(0.014)	(0.015)	(0.020)
Observations	139277	130989	116550	139277	130989	116550
Adjusted R^2	0.756	0.865	0.881	0.755	0.864	0.882
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No	Yes	No	No
County Fixed Effects	Yes	No	No	Yes	No	No
Bank Fixed Effects	Yes	No	No	Yes	No	No
County-Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Bank-County Fixed Effects	No	Yes	Yes	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes	No	No	Yes

Table OA.7: Robustness - OTS Extinction and Small Business Lending - Proforma Banks after Mergers and Acquisitions

Table OA.7 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on the supply of small business lending by former OTS banks using the proforma lending of banks that accounts for mergers and acquisitions throughout the period. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Ln(Total Loans)		
OTS × Post	0.229***	0.155***	0.177***
	(0.043)	(0.039)	(0.042)
Observations	135384	127890	117019
Adjusted R^2	0.746	0.855	0.866
Baseline Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No
County Fixed Effects	Yes	No	No
Bank Fixed Effects	Yes	No	No
County-Year Fixed Effects	No	Yes	Yes
Bank-County Fixed Effects	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes

Table OA.8: Robustness - OTS Extinction and Small Business Lending - Impact of Other Dodd-Frank Provisions

Table OA.8 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on the supply of small business lending by former OTS banks after conditioning on indicator variables representing whether the bank holds total assets above $10 billion and as a result is subject to the regulation of the Consumer Protection Financial Bureau (CFPB) and whether the county is located in a state that allowed *de novo* branching. The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). *Post Dodd-Frank (2010)* is an indicator variable that takes the value of one for all years after 2010 (inclusive). The CFPB and the interstate branching deregulation were enacted immediately after the passage of Dodd-Frank into law on July, 21st, 2010. *Above 10bi* is an indicator variable that takes the value of one if the bank is over $10 billion in assets and therefore subject to the supervision of the CFPB. *DeNovo Branching State* is an indicator variable that takes the value for all bank-county combinations that are part of a state that did not allow de novo interstate branching prior to the passage of Dodd-Frank. We obtain this list of states from Strahan and Rice (2010) and also exclude New York from this list because it deregulated de novo branching in 2008. Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Ln(Total Loans)					
OTS × Post	0.202***	0.084**	0.150***	0.204***	0.089**	0.153***
	(0.041)	(0.039)	(0.041)	(0.041)	(0.039)	(0.041)
Above 10bi × Post Dodd-Frank (2010)	-0.040***	-0.027*	-0.033*			
	(0.015)	(0.015)	(0.019)			
DeNovo Branching State × Post Dodd-Frank (2010)				-0.061***	0.555***	0.702***
				(0.014)	(0.053)	(0.064)
Observations	137953	129393	116096	139277	130989	116550
Adjusted R^2	0.756	0.865	0.882	0.755	0.864	0.881
Baseline Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No	Yes	No	No
County Fixed Effects	Yes	No	No	Yes	No	No
Bank Fixed Effects	Yes	No	No	Yes	No	No
County-Year Fixed Effects	No	Yes	Yes	No	Yes	Yes
Bank-County Fixed Effects	No	Yes	Yes	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes	No	No	Yes

Table OA.9: OTS Extinction and CRA Ratings

Panel A of Table OA.9 reports the coefficients of OLS regressions. The dependent variable in columns (1) and (2), *Bad CRA Rating* takes the value of one if the bank was assigned less than a satisfactory CRA Rating (Rating of 3 or 4) in the aftermath of the CRA examination The dependent variable in columns (3) and (4), *CRA Rating Downgrade* is an indicator variable that takes the value of one if the bank's CRA rating was downgraded in the last examinations. Panel B follows Agarwal, Benmelech, Bergman, and Seru (2012) and examines if the relation between OTS Extinction and CRA examinations is more pronounced during examination years. All other variables are defined as in previous tables. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

Panel A: Impact of OTS Extinction on CRA Ratings

	(1)	(2)	(3)	(4)
	Bad CRA Rating		CRA Rating Downgrade	
OTS × Post	0.007	0.006	0.065	0.062
	(0.007)	(0.007)	(0.063)	(0.062)
Ln(Assets)		0.001		-0.023
		(0.004)		(0.025)
Residential Share		-0.037		-0.115
		(0.033)		(0.182)
C&I Share		-0.001		0.012
		(0.057)		(0.209)
CRE Share		-0.021		-0.073
		(0.027)		(0.118)
Tier1 Capital Ratio		-0.000		0.000
		(0.000)		(0.002)
Observations	7594	7563	2113	2105
Adjusted R^2	0.038	0.039	-0.009	-0.011
Baseline Controls	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Panel B: OTS Extinction and Small Business Lending - Controlling for CRA Exam Years

	(1)	(2)	(3)
	Ln(Total Loans)		
OTS × Post	0.230***	0.122***	0.222***
	(0.044)	(0.042)	(0.045)
CRA Exam Year	-0.001	0.003	-0.025***
	(0.005)	(0.005)	(0.008)
OTS × Post × CRA Exam Year	-0.095*	-0.130**	-0.252***
	(0.055)	(0.052)	(0.054)
Observations	139277	130989	116550
Adjusted R^2	0.756	0.864	0.881
Baseline Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No
County Fixed Effects	Yes	No	No
Bank Fixed Effects	Yes	No	No
County-Year Fixed Effects	No	Yes	Yes
Bank-County Fixed Effects	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes

Table OA.10: OTS Extinction and Small Business Lending: Local Credit Supply by Competitor

Table OA.10 reports the coefficients of OLS regressions. Columns (1) and (2) repeat the analysis of column (2) of Table 5 after stratifying the sample based on above- and below-median levels of the weighted average Tier1 Capital Ratio of local competitors, where the weights assigned to each local competitor are based on the share of deposits of that competitor in the county. Columns (3) and (4) repeat the analysis of column (2) of Table 5 after stratifying the sample based on above- and below-median level of the predicted negative lending shock in the county, which is measured using the same methodology as in Greenstone, Mas, and Nguyen (2015). The dependent variable *Ln(Total Loans)* is the total amount of small business loans (loans whose principal amount is below $1 million) originated by a depository institution in a county over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Ln(Total Loans)			
	Hi Competitor Cap.	Low Competitor Cap.	Low Neg Lending Shock	Hi Neg Lending Shock
OTS × Post	0.043	0.097*	0.047	0.119**
	(0.060)	(0.056)	(0.055)	(0.054)
Observations	65320	55614	65575	65414
Adjusted R^2	0.859	0.866	0.862	0.866
Baseline Controls	Yes	Yes	Yes	Yes
County-Year Fixed Effects	Yes	Yes	Yes	Yes
Bank-County Fixed Effects	Yes	Yes	Yes	Yes

Table OA.11: OTS Extinction and Mortgage Lending Volume (Census Tract)

Table OA.11 reports the coefficients of OLS regressions investigating the effect of the OTS extinction on the volume of mortgage loans originated by former OTS banks. The dependent variable *Ln(Total Mortgage Loans)* is the total amount of mortgage loans originated by a depository institution in a census tract over a calendar year. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Baseline controls include linear and quadratic terms for the number of branches and total amount of deposits of each bank in each county. Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Ln(Total Mortgage Loans)		
OTS × post	-0.037**	-0.129***	-0.159***
	(0.017)	(0.021)	(0.022)
Observations	5289970	4835833	4818314
Adjusted R^2	0.527	0.672	0.650
Baseline Controls	Yes	Yes	Yes
Year Fixed Effects	Yes	No	No
Census-Tract Fixed Effects	Yes	No	No
Bank Fixed Effects	Yes	No	No
Census-Tract×Year Fixed Effects	No	Yes	Yes
Bank×Census Tract Fixed Effects	No	Yes	Yes
Coarsened Exact Matching	No	No	Yes

Table OA.12: OTS Extinction and Mortgage Lending (Likelihood of Application Rejection)

Table OA.12 reports the results of empirical analyses investigating the relation between the OTS extinction and the probability of rejection of a mortgage loan application. The coefficients are obtained from the OLS estimation of the following specification model: $Reject_{ibct} = \delta X_i + \beta OTS_b \times Post_t + FixedEffects + \epsilon_t$, where the subscripts index for the mortgage application i in census tract c to bank b during year t. The vector δX_i includes a number of characteristics of the application, namely loan occupancy status, property type, lien status, loan-to-income ratio, applicant's ethnicity, and applicant's race. *OTS* is an indicator variable that takes the value of one if the depository institution primary regulator in the first and second quarter of 2011 was the Office of Thrift Supervision. *Post* is an indicator variable that takes the value of one for all years after 2011 (inclusive). Standard errors are presented in parentheses, and are clustered at the county level. ***, **, and *, represent statistical significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Application Rejection			
OTS × Post	0.009***	0.002	0.010***	0.002
	(0.003)	(0.004)	(0.003)	(0.004)
Loan to Income Ratio	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	38684393	38683775	38683683	38675108
Adjusted R^2	0.110	0.119	0.123	0.136
Application Controls	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	No	Yes	No
Bank Fixed Effects	Yes	No	Yes	No
County Fixed Effects	Yes	No	No	No
Census-Tract Fixed Effects	No	No	Yes	No
Bank × County Fixed Effects	No	Yes	No	No
Bank × Census-Tract Fixed Effects	No	No	No	Yes
County × Year Fixed Effects	No	Yes	No	No
Census-Tract × Year Fixed Effects	No	No	No	Yes