The Spillover Effect of Consolidating Securitization Entities on Small Business Lending

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ABSTRACT

I investigate how the consolidation of securitization entities under SFAS 166 and 167 spills over to banks' supply of small business loans, which are rarely securitized in the United States. This spillover operates through two channels. (1) In the leverage channel, consolidating banks downsize their entire loan portfolios, both small business loans and other loans, in response to increased leverage after consolidation. (2) In the risk management channel, consolidating banks adjust the mix of loans to maintain optimal diversification. The adjustment can increase the supply of small business loans when their performance covaries positively with the performance of other loans. I find that on average, banks that consolidate more securitized assets reduce small business lending; consequently, counties with a greater market share of consolidating banks experience slower growth in small businesses. I also identify a small group of banks with sufficiently large positive performance covariance that increase small business lending.

Keywords: SFAS 166 and 167; off–balance sheet; spillovers; leverage; risk management; performance covariance; small business lending

JEL Classification: M4; G21

I. INTRODUCTION

Off–balance sheet securitization has been criticized for contributing to excessive lending and the recent financial crisis. Partly in response, the Financial Accounting Standards Board (FASB) issued the Statements of Financial Accounting Standards (SFAS) 166 and 167, which went into effect in 2010. SFAS 166 eliminates the notion of qualifying special purpose entities that had been exempt from consolidation. SFAS 167 tightens the conditions under which securitization entities remain unconsolidated. As a consequence of SFAS 166 and 167, commercial banks recognized $378 billion of the assets held by securitization entities on their balance sheets. Shortly afterward, bank regulators included these assets in regulatory capital calculations. One purpose of the new accounting and regulatory rules ("the new rules") is to curtail the excessive origination of easily securitizable loans, such as mortgages and consumer loans. However, critics expressed concern that such consolidation will reduce other types of lending and thereby slow the economic recovery. I investigate this spillover effect in the context of small business lending. My findings support the concern that consolidating securitization entities on average reduces the lending to and growth of small businesses.

I examine small business loans for several reasons. First, bank loans are the primary source of external financing for small firms, an important sector of the U.S. economy. A reduction in the credit supply to this sector would be detrimental to the growth of these firms and the broader economy. Second, small business loans are rarely securitized in the U.S. due to the heterogeneity in underwriting standards and loan terms. This feature makes small business loans ideal candidates for studying the spillover effects of the consolidation of securitization entities under SFAS 166 and 167. Third, the Community Reinvestment Act (CRA) disclosure reports provide the annual amount of small business lending by a bank in each county. These data enable

me to hold local credit demand constant by comparing the lending within the same county-year across banks affected differently by the new rules.

According to portfolio theory, optimal portfolio construction involves balancing risk and return. In a portfolio with two assets, the optimal allocation to one asset is an increasing function of its risk-adjusted returns, and a decreasing function of the other asset's risk-adjusted returns when their performance covaries positively. Based on this insight, I propose two related channels through which the consolidation of securitization entities spills over to small business lending: the leverage channel and the risk management channel. In the leverage channel, consolidation reduces a bank's regulatory capital adequacy and increases its market discipline, which pressures it to deleverage. The deleveraging process reduces the risk-adjusted returns of both small business loans and other loans (i.e., all non–small business loans) by increasing the bank's costs of capital. As such, the bank has incentives to downsize both types of loans. In the risk management channel, the bank adjusts the mix of loans to maintain optimal diversification. When the returns on small business loans covary positively with the returns on other loans, the incentive to reduce other loans via the leverage channel *increases* the bank's willingness to supply small business loans. The net effect on small business lending depends on the relative strength of the two channels, as captured by the return covariance of small business and other loans divided by the return variance of other loans (hereafter, "performance covariance"). If the positive performance covariance is small (sufficiently large), the leverage (risk management) effect dominates and the consolidation reduces (increases) small business lending.

I obtain bank data from the Call Reports and banks' county-level small business lending data from the CRA reports for 2007-2013 to form a panel with bank-county-year as the unit of observation. As the consolidation is related to the level of securitization, which affects bank

lending, I construct a matched sample based on this securitization level. Treatment banks are those that consolidate securitization entities under SFAS 166 and 167. The assets of consolidated entities represent 10.7 percent of the average treatment bank's total assets. For each treatment bank in a county-year, I select a control bank that lends in the same county-year and conducts the closest amount of securitization to the treatment bank, but does not consolidate any entity. For the treatment banks, I find a positive performance covariance between small business loans and other loans, which suggests that the leverage and risk management channels have opposite effects on small business lending.

I use a difference-in-differences design to compare the changes to the small business lending of treatment banks with control banks in the same county. I find that banks that consolidate the average amount of assets in securitization entities exhibit a 13 percent reduction in small business lending relative to control banks after the new rules. This result suggests that, on average, the leverage channel dominates. Consistent with this channel, the reduction is stronger for banks with (a) greater downward pressure on regulatory capital ratios due to consolidation and (b) more uninsured deposits, which provide stronger market discipline.

I examine the risk management channel by exploring the cross-sectional variation in the performance covariance between small business loans and other loans. As the performance covariance increases, the degree of substitutability between these two loan types and the strength of the risk management channel also increases. I predict and find that the reduction in small business lending is weaker for banks with higher performance covariance. I also identify a small group of banks with sufficiently high performance covariance that increase small business lending after the consolidation. This evidence suggests that the risk management channel plays a significant role in influencing small business lending.

To mitigate the concern that the average reduction in small business lending is attributable to factors other than the consolidation of securitization entities, I conduct three additional analyses. First, despite matching on the level of securitizations, treatment banks securitize more credit card receivables than control banks. I show that this difference is unlikely to explain the results since treatment banks do not appear to suffer more from the severe decline in liquidity during the financial crisis. Second, banks that reduce small business lending might conduct more credit card securitizations, and thereby become treatment banks. To address this reverse causality, I employ an instrumental variable (IV) that captures a bank's exposure to credit card securitization in 2001. This variable is determined well before the new rules and strongly predicts the consolidation under SFAS 166 and 167. My results are robust to using this IV approach. Third, in my difference-in-differences design, I assume that treatment and control banks would exhibit parallel trends in their lending to small businesses absent the new rules. Indeed, I find that the reduction in small business lending takes place shortly after the adoption of SFAS 166 and 167, not before it.

Finally, I explore the implications of the consolidation on the loan quality of banks and the local economy. I find that the average quality of commercial loans of treatment banks improves relative to control banks. After the new rules, the aggregate small business lending in counties where consolidating banks have greater market share decreases; the growth of the number of small businesses in these counties also declines.

This study informs the current debate on the consequences of SFAS 166 and 167. Extant research examines loans that can be easily securitized. I document a spillover effect on small business loans, which are rarely securitized in the U.S. More importantly, I find evidence consistent with both the leverage and the risk management channels, with the latter channel

being novel to the accounting literature. This finding enhances the understanding of the scope and nature of the real effects of securitization accounting.

Although I include numerous controls and subject the results to additional robustness tests, several caveats are in order. First, I acknowledge that the change in consolidation status for treatment banks is not a random trial. As such, the statistical associations documented in this paper do not necessarily establish causal relations. Second, non–small business loans consist of various loan categories (e.g., consumer loans, mortgages, corporate loans). I aggregate all of them into other loans to keep the development and tests of the risk management channel manageable. Future work can advance this literature by modeling the performance covariance between small business loans and each loan category separately. Finally, while the risk management channel involves non–small business loans, I do not test for changes in these loans and how the risk management channel affects them around the new rules. This presents an opportunity for future research.

II. INSTITUTIONAL BACKGROUND

Securitization is a process in which banks transfer financial assets to legally separate special purpose entities (SPEs) that sell securities representing claims to the cash flows generated by the assets. To securitize credit-risky and opaque assets such as credit card receivables, banks sometimes provide implicit or explicit recourse (Higgins and Mason 2004). Some banks also sponsor entities that securitize other institutions' assets and often provide administrative services and guarantees (Bens and Monahan 2008; Acharya, Schnabl, and Suarez 2013).

Before the issuance of SFAS 166 and 167, banks claimed that securitization entities such as credit card master trusts were qualifying special purpose entities (QSPEs), which were exempt from consolidation by the banks under SFAS 140. Banks derecognized the financial assets

transferred to QSPEs and did not recognize the related asset-backed securities if sale accounting was achieved (Landsman, Peasnell, and Shakespeare 2008; Dechow and Shakespeare 2009). Non-QSPEs, such as multi-seller asset-backed commercial paper (ABCP) conduits, were treated as variable interest entities (VIEs). VIEs were evaluated for consolidation by the primary beneficiary based on a quantitative model under FIN 46(R). The primary beneficiary was the party that absorbed a majority of the VIE's expected losses. Although sponsor banks typically bore the majority of the risks of ABCP conduits, they often restructured deals to avoid consolidation of the entities (Bens and Monahan 2008). Assets in unconsolidated securitization entities were excluded from banks' total and risk-weighted assets. Assets in consolidated ABCP conduits were excluded from banks' risk-weighted assets (the "ABCP exclusion"; Federal Reserve Board 2004).

Various parties criticized the off–balance sheet status of securitizations. They argued that banks often hid the risks of off–balance sheet securitized assets from investors and held insufficient regulatory capital for the assets (Herz 2009; Barth and Landsman 2010). Partly in response, FASB issued SFAS 166 and 167 to amend the securitization accounting standards (FASB 2009a, 2009b). In particular, SFAS 166 eliminates the QSPE concept in SFAS 140, and thus subjects these entities to potential consolidation (PwC 2009a). SFAS 167 amends FIN 46(R) by adopting a qualitative model. This model defines the primary beneficiary as the party that has both the power to direct the most significant activities of the VIE and the exposure to losses and benefits potentially significant to the VIE. This approach diminishes opportunities for banks to restructure securities to circumvent consolidation (PwC 2009b). Collectively, the new standards require commercial banks to consolidate $378 billion of the assets in securitization entities

(mostly credit card securitization entities and ABCP conduits) as of March 31, 2010 (Federal Reserve Board 2010a).

Bank regulators include consolidated assets in regulatory capital calculations. Specifically, under the new rules, banks are required to record loss reserves for loans in consolidated entities, which decreases the numerator (tier 1 capital) of capital ratios, and to include the assets of the entities in total assets, which increases the denominator. The new rules also eliminated the ABCP exclusion and provided banks with the option to delay the consolidation effects on their risk-based capital ratios for two quarters, which is followed by a two-quarter phase-in. While the new rules were intended to curtail excessive origination of easily securitizable loans (Federal Reserve Board 2009, 2010b), many banks expressed concerns about the negative consequences for non-securitized loans and economic recovery.[1]

III. RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Related Literature

Several studies examine the real effects of SFAS 166 and 167. Ahn et al. (2020) find that to achieve an off–balance sheet status under the new rules, banks ceded their servicing (special servicing) functions for securitized residential (commercial) mortgages to third parties. Tian and Zhang (2017) find a decline in credit card securitizations and less regulatory capital arbitrage after consolidation. These studies document the direct effects of the new rules on securitization activities. In contrast, I find a spillover effect on non-securitized loans, for which the new rules

[1] For example, in its comment letter on the proposed new rules, Citigroup (2009) warned: "[T]he 2009 GAAP modifications are expected to manifest in reductions in overall lending, not only in lending activity primarily financed through securitizations, such as credit cards, residential mortgage loans, and student loans.… As indicated, we do not plan to reduce lending in only those businesses specifically impacted by the incremental regulatory capital requirements." The Risk Management Association (2009) was concerned that the reduction in lending "could dramatically slow the nascent economic recovery."

did not change the accounting. My findings broaden the scope of the economic consequences of the new rules and thus complement the studies above.[2]

Dou, Ryan, and Xie (2018) examine the implications of SFAS 166 and 167 for financial stability. They document that consolidating banks reduce their risks through lower approval rates and higher sale rates of mortgages, with the latter effect transferring the risks to the less-regulated shadow banking system. Dou and Xu (2020) examine the impact of SFAS 166 and 167 on corporate innovation. They find a reduction in corporate loans from consolidating banks to public companies and a reduction in their R&D and patent production.

My paper differs from Dou et al. (2018) and Dou and Xu (2020) in two aspects. First, both studies solely rely on the leverage channel to motivate their analyses and interpretations. In addition to confirming this channel in the context of small business lending, I test for a new channel motivated by banks' risk management concerns: they consider the performance covariance of different loan types and adjust their loan mix to yield optimal diversification. The evidence supports the risk management channel and thereby enhances our understanding of how securitization accounting spills over into a seemingly unrelated lending sector.

Second, compared with mortgages and corporate loans, small business loans have two unique features that allow me to make strong inferences. Although the new rules induce very little consolidation of mortgage securitizations by banks due to transaction structuring (Ahn et al. 2020), mortgage originations are heavily influenced by securitization opportunities (Purnanandam 2011). As such, it is difficult to disentangle the effect of consolidation from that of securitization market dynamics. In contrast, small business loans provide a clean setting in

[2] My study also adds to the literature on externalities of regulation (Badertscher, Shroff, and White 2013; Leuz and Wysocki 2016; Chen, Dou, and Zou 2020) and the role of accounting in small business lending (Allee and Yohn 2009; Cassar, Ittner, and Cavalluzzo 2015; Minnis and Sutherland 2016).

which I can hold the (nearly nonexistent) securitization market constant over time to isolate the spillover effect.[3] Small business lending is also a highly localized activity (Petersen and Rajan 2002), which enables me to control for the local credit demand by comparing the small business lending of banks within the same county-year. This within-county-year comparison cannot be implemented for corporate loans as corporate borrowers have access to national/global capital markets using a variety of financial instruments (e.g., equity, bonds, and loans from banks and collateralized loan obligations; Bozanic, Loumioti, and Vasvari 2018).

Hypothesis Development

The loan portfolios of banks consist primarily of small business loans, corporate loans, consumer loans, and mortgages. For parsimony, consider two loan types: small business loans and other loans (i.e., all non–small business loans).[4] According to portfolio theory, the optimal allocation to small business loans is increasing in their risk-adjusted returns, and decreasing in risk-adjusted returns of other loans when their performance covaries positively. Based on this insight, I hypothesize that the consolidation of securitization entities spills over to small business lending through two channels: the leverage channel and the risk management channel.

According to the leverage channel, the consolidation reduces banks' regulatory capital adequacy and increases their market discipline.[5] Banks actively manage their capital ratios

[3] According to the Securities Industry and Financial Markets Association, $33.2 billion of small business loans were securitized in the U.S. in 2013. This amount equals only 0.8 percent of total small business loans outstanding as of the end of 2013 ($4.2 trillion based on Federal Reserve Statistical Release Z.1). For securitization of small business loans in Europe, see Ertan, Loumioti, and Wittenburg-Moerman (2017).

[4] The partition into these two loan types is motivated by my focus on small business lending and its interaction with the rest of the loan portfolio. The split is not based on whether a loan type is directly affected by SFAS 166/167. The hypothesis development does not require that the new rules change the accounting for all non–small business loans.

[5] An implicit assumption of the market discipline argument is that market participants view off–balance sheet securitized assets as less risky than on–balance sheet assets. Research evidence suggests that this assumption appears plausible. Barth, Ormazabal, and Taylor (2012) find that the market perception of a securitizing bank's credit risk, proxied by credit ratings, is positively related to the retained interest in the securitized assets (i.e., on–balance sheet assets) and unrelated to the portion of the securitized assets not retained by the bank (i.e., off–balance sheet assets). Exploiting the adoption of FIN 46(R), which moved some off–balance sheet assets onto the balance sheet, Callahan, Smith, and Spencer (2012) find that affected firms experience an increase in the costs of capital.

around target levels that are substantially above regulatory minimums to build "capital cushions" (Berger, DeYoung, Flannery, Lee, and Oztekin 2008; Kashyap, Stein, and Hanson 2010). Negative shocks to these ratios, even if they remain above regulatory minimums, often trigger adjustments toward target levels. Banks typically reduce liabilities, as they consider equity raising cost-prohibitive (Stein 1998; Hodder, Kohlbeck, and McAnally 2002; Adrian and Shin 2011).[6] For the market discipline concern, studies show that when bank leverage increases, capital providers, such as uninsured depositors, withdraw their funds and demand higher interest rates (Ellis and Flannery 1992; Bushman 2014; Berger and Turk-Ariss 2015).[7] For example, in the comment letter on the proposed new rules, World's Foremost Bank (2009) expressed concern that because the bank "will have to consolidate the Cabela's Master Credit Card Trust…our ability to issue certificates of deposit could be affected." As such, banks are pressured to deleverage. The deleveraging process increases their costs of capital and thus reduces the risk-adjusted returns of both small business and other loans. Consequently, banks have incentives to cut down both types of loans.

On the other hand, banks are concerned with risk management due to capital market imperfections. They care about the risk of loan portfolios and want to achieve better risk-return tradeoffs by adjusting the loan mix according to the performance covariance (Froot and Stein

[6] In the comment letter on the proposed new rules, the American Express Company (2009) warned that: "it will prove difficult and costly…to raise adequate capital in a way that will not stifle the operations or lending ability of the banking industry." I find that the average annual change in consolidating banks' equity attributable to the sale of capital stock during 2010-2013 equals only 0.18 percent of their total assets.

[7] Uninsured deposits consist primarily of large certificates of deposits (CDs) that are issued in denominations above the limit for deposit insurance coverage. Financial institutions, local authorities, and municipalities typically invest their idle funds in large CDs (Mishkin 2006). These investors and their money brokers routinely rely on a bank's financial statements "when making decisions on whether to buy jumbo certificates of deposit or make other investments" at the bank (Paschal 1986). Most large CDs mature within one year (Federal Reserve Bank of Richmond 1998, Chapter 4). The short maturity provides investors with opportunities to withdraw or reprice the deposits. In an untabulated test, I find that banks which consolidate more assets held by securitization entities experience a decline in uninsured deposits, which supports the market discipline concern.

1998; Acharya and Ryan 2016; Loumioti and Vasvari 2019a, 2019b). DeYoung, Gron, Torna, and Winton (2015) show that this risk management concern is important, as banks may reject an otherwise profitable lending opportunity if its performance covaries positively with the rest of their portfolios. When returns on the two loan types covary positively (negatively), they work as substitutes (complements). As such, the incentive to reduce other loans as per the leverage channel increases (decreases) banks' willingness to supply small business loans. Of course, the incentive to reduce small business loans through the leverage channel also increases (decreases) banks' willingness to supply other loans, although this is not the focus of this paper.

In Appendix A, I develop a loan portfolio model, in which the bank balances incentives from both channels to simultaneously determine the optimal levels of small business and other loans before and after the consolidation. The model shows that the net spillover effect on small business lending depends on the sign and magnitude of the performance covariance (i.e., the return covariance between small business loans and other loans divided by the return variance of other loans). When the performance covariance is negative, consolidation unambiguously reduces small business lending; when it is positive, the two channels operate in opposite directions. If the performance covariance is small (sufficiently large), the leverage (risk management) channel dominates and the consolidation reduces (increases) small business lending.

IV. DATA AND SAMPLE CONSTRUCTION

I obtain data on the consolidation of securitization entities and other bank-level information from commercial banks' Call Reports for the 2007-2013 period.[8] Beginning in

[8] There are two reasons I focus on commercial banks as opposed to bank holding companies (BHCs), which are examined by Dou et al. (2018). First, although all BHCs own commercial banks, not all commercial banks are owned by BHCs. For example, 49 percent of treatment banks in my sample do not belong to any consolidating BHC used in Dou et al. (2018). Thus, focusing on BHCs unnecessarily limits subsequent inferences. My main result holds

2011Q1, Schedule RC-V reports consolidated VIEs for banks deemed the primary beneficiaries of VIEs under SFAS 166 and 167. I assess the impacts of the consolidation on banks' balance sheets using the first Schedule RC-V. Requiring positive consolidated VIE assets in 2011Q1 and necessary data for the variables described below yields 37 treatment banks. Table 1 shows that these banks have average total assets of $188.1 billion and total equity of $20.7 billion. The average assets of consolidated VIEs are $14.5 billion, of which the majority is from securitization vehicles ($12.1 billion). The $14.5 billion likely misstates the incremental effect of SFAS 166 and 167 in two respects. First, this number may overstate the effect to the extent that the treatment banks have already consolidated securitization entities under SFAS 140 and FIN 46(R). However, such prior on–balance sheet entities are expected to be limited because nearly all securitizations were structured as QSPEs (FDIC 2007), which were exempt from consolidation. Second, since Schedule RC-V is not available until 2011Q1 and banks may have reduced the assets held by their consolidated VIEs during 2010, the number likely understates the effect of the adoption of SFAS 166 and 167 at the beginning of 2010.

The assets of consolidated entities represent 10.7 percent of the treatment banks' assets. Unsurprisingly, the majority of these assets are loans. Schedule RC-V does not provide a breakdown by loan category. The Federal Reserve Board (2010c) reports that at the aggregate level, the top two loan classes in consolidated entities are credit cards (75 percent) and consumer loans other than credit cards (7 percent). I estimate the impact of consolidation on a bank's tier 1 risk-based capital ratio as the difference between the ratio as if SFAS 166 and 167 had not been implemented (the "as-if" ratio) and the ratio as reported. The as-if ratio is the bank's tier 1 capital

if I use only banks not owned by BHCs. Second, a BHC may consolidate securitization entities through nonbank subsidiaries (e.g., entities sponsored either directly by the BHC or by its nonbank subsidiaries). Such consolidation only exerts indirect effects on the small business lending of commercial banks owned by the same BHC.

plus the loan loss reserves of consolidated entities, divided by the bank's total risk-weighted assets minus the difference between the risk-weighted assets of consolidated entities and the bank's risk-weighted interests in those entities.[9] On average, consolidation lowers banks' tier 1 risk-based capital ratios by 210 basis points. The reduction represents a substantial portion of the average tier 1 capital ratio of 11.3 percent immediately before the new rules.[10]

The CRA requires banks to disclose the geographic distribution of their small business lending. The disclosures include the total dollar amount of small business loans, defined as commercial and industrial loans and commercial real estate loans under $1 million, made by the bank in each assessment area in each year. I aggregate each bank's lending and conduct county-level analyses as a county is typically considered a local market in the banking literature (Berger, Demsetz, and Strahan 1999; Huang 2008). This consideration is supported by two empirical facts. First, Petersen and Rajan (2002) report a median distance of five miles between small businesses and their primary lending banks. The median size of the counties in my sample is 615 square miles; parties five miles apart are likely located in the same county. Second, for each bank, I distinguish its small business lending in counties where it has a branch office from counties where it does not have one. The median bank's small business lending in counties

[9] Schedule RC-V reports consolidated VIEs' assets and liabilities. I use the difference between these two amounts to infer the bank's interests in the entities. Schedule RC-V disaggregates consolidated VIEs' assets into twelve accounts (e.g., available-for-sale securities, loans and leases, etc.). The risk weight for each asset account (e.g., available-for-sale securities) of consolidated entities is calculated as the average risk weight of that account on the bank's Call Reports (e.g., the bank's risk-weighted available-for-sale securities, divided by the bank's available-for-sale securities). Since most loans of consolidated entities are credit cards, I assign a 100 percent risk weight to the loans and leases account. I also assign a 100 percent risk weight to the bank's interests in those entities.

[10] I also estimate the impact of consolidation on a bank's equity-to-asset ratio (i.e., one minus the leverage ratio) as the difference between the ratio as if SFAS 166/167 had not been implemented (the "as-if" ratio) and the ratio as reported. The as-if ratio is the bank's equity plus the loan loss reserves of consolidated entities, divided by the bank's total assets minus the difference between the assets of consolidated entities and the bank's interests in those entities. On average, consolidation lowers banks' equity ratios by 174 basis points.

where it has branches accounts for 87 percent of its total small business lending. Thus, small business lending is a highly localized (primarily county-level) activity.

I merge data from Call Reports and CRA reports and form a panel with bank-county-year as the unit of observation. CRA data cover all banks with more than $1 billion in total assets (FFIEC 2013; Dou and Zou 2019). Greenstone, Mas, and Nguyen (2020) estimate that, in 2007, CRA reporting banks extend 86 percent of the small business loans of all commercial banks. Small business lending by consolidating banks constitutes 43 percent of small business lending by all CRA reporting banks in 2007 and thus is economically important.

Matching

Since the consolidation is closely related to the presence and size of securitization activities, which affect lending, I use a matching procedure to construct a comparable control group. I identify banks that are similar in total securitized assets to treatment banks so that I can isolate the consolidation effect. The total securitized assets is the sum of the off–balance sheet securitized assets with recourse, assets in consolidated securitization entities under SFAS 166 and 167, and the maximum amount of credit exposure that arises from credit enhancements provided to ABCP conduits.

I employ a caliper-based nearest-neighbor matching process. For each lending observation by a treatment bank in a county-year starting in 2007, I select a control bank if it lends in the same county-year, has the closest total securitized assets divided by total assets (*Securitization*) to the treatment bank, and does not consolidate any entity under SFAS 166 and 167. To ensure that the closest available match is reasonably close in absolute terms, I require the maximum of $Securitization_{treat}$ and $Securitization_{control}$ divided by the minimum of $Securitization_{treat}$ and $Securitization_{control}$ to be less than two for the control bank. If no match is

identified, I discard the observation and find a match in the next year. Once a match is identified, it is retained in subsequent years to ensure a balanced panel structure. I match with replacement, though the results are robust to matching without replacement. If a matched control bank exits the panel, I splice a new match. In this geographic matching approach, I can hold local credit demand constant by comparing lending in the same county-year.[11] The resulting matched sample consists of 237,154 bank-county-year observations and represents 1,255 bank-years in total.

Research Design

The regression specification takes the form:

$$Small\ business\ lending_{ict} = a + b_1 Consolidation_{it-1} + CX_{it-1} + d_{ct} + f_i + \varepsilon_{ict}, \quad (1)$$

where *Small business lending*$_{ict}$ is the dependent variable that equals the log of total small business lending in thousands of dollars by bank *i* in county *c* and year *t*. The variable of interest *Consolidation*$_{it\text{-}1}$ is equal to the assets in consolidated entities under SFAS 166 and 167 for bank *i* at the beginning of year *t* divided by the bank's total assets, and zero otherwise (for all banks before 2010, and for control banks afterward). As consolidation data in Schedule RC-V are available since 2011Q1, I assign the value of *Consolidation* for a treatment bank as of 2011Q1 to observations of the same bank in 2010 and 2011. For observations in 2012 and 2013, I calculate *Consolidation* as of 2011Q4 and 2012Q4, respectively. The assignment might underestimate the true impacts of SFAS 166 and 167 on banks' balance sheets if they reduced the size of consolidated entities in response to the adoption of SFAS 166 and 167 in 2010. Deleting observations from 2010 does not alter my inferences in subsequent analyses.

[11] For example, in 2011, First National Bank of Omaha had securitized assets equal to 19 percent of its total assets and consolidated 95 percent of them on its books. I match its small business lending in Faulkner County, Arkansas, with that of Arvest Bank, which did not consolidate any entity under SFAS 166 and 167, but securitized assets equal to 12.5 percent of its total assets. Since the two lenders were exposed to the same local economic conditions in Faulkner County, they faced similar credit demand. By comparing the lending of First National Bank of Omaha in Faulkner with that of Arvest Bank, I remove the confounding effect of unobserved local credit demand.

The county-year fixed effects (d_{ct}) enable the comparison of lending within a county-year, and the bank fixed effects (f_i) account for time-invariant bank heterogeneity. Replacing bank fixed effects with bank-county fixed effects yields even stronger results. The presence of bank and county-year fixed effects permits interpretation of the model as a difference-in-differences specification (Angrist and Pischke 2009). This specification differs slightly from the traditional difference-in-differences design in two aspects: (1) I allow year fixed effects to vary across counties; (2) the treatment is directly tied to the magnitude of consolidation (one can think of as *Consolidation* as the magnitude of consolidation times an indicator for the post-SFAS 166/167 period). All standard errors are two-way clustered at the bank and county-year levels.[12]

Vector *X* includes the bank characteristics that are often included in models in empirical bank accounting research. These variables help to control for differences between treatment and control banks other than the consolidation. Total securitized assets (*Securitization*) and retained interests (*Retained interest*), both of which are divided by total assets, account for the remaining differences in exposure to securitization markets between treatment and control banks after the matching procedure (Chen et al. 2008). The log of total assets (*Assets*) and equity-to-asset ratios (*Equity*) capture bank size and financial position, respectively (Lo 2015). To account for affiliation with too-big-to-fail bank holding companies, I include an indicator variable for whether the bank is subject to the stress test (*Stress test*) in that year (Acharya, Berger, and Roman 2018). I use earnings before loan loss provisions (*Cash flow*) and bank deposits (*Deposit*), both of which are divided by total assets, to measure bank liquidity (Lo 2015). Nonperforming commercial loans divided by total commercial loans (*Commercial nonperf*)

[12] Even though I include bank and county-year fixed effects, clustering by bank and county-year is important, as the fixed effects do not fully capture serial correlation in residuals (e.g., they cannot fully capture autoregressive shocks to banks; Stock and Watson 2008). Since small business lending is a highly localized banking activity, local shocks likely yield correlated residuals across banks within each county-year.

capture the quality of commercial lending, and non-commercial loans divided by total assets (*Noncommercial loan*) reflect loan composition (Bhat, Ryan, and Vyas 2019). Variable definitions are in Appendix B. All bank-level variables are measured at the beginning of year *t*.

Descriptive Statistics

Panel A of Table 2 presents the descriptive statistics for the treatment and control banks. The data do not reject the null hypothesis that the means of *Securitization* are equal across groups both before and after the effective year of the new rules (t = 0.326 and 0.443, respectively). This result suggests that the treatment and control banks are well matched for the level of securitizations. All the bank characteristics except for total assets exhibit insignificant differences across groups. The rightmost column shows no statistically significant change from the pre-period (2007-2009) to the post-period (2010-2013) in the differences between the treatment and control banks.

Panel B of Table 2 reports the loan portfolio composition of my sample banks. On average, 66 percent of total assets are loans. Commercial loans, including both commercial and industrial loans and commercial real estate loans, account for 30 percent of the total assets. I aggregate all small business lending from CRA reports to the bank-year level (*Small business loans origination*). Since the average maturity of small business loans is about three years (Leeth and Scott 1989), I multiply the bank-year level lending amount by three to infer the amount of loans outstanding (*Small business loans outstanding*), which constitutes 18 percent of total bank assets. Home mortgages and consumer loans constitute 16 percent and 7 percent of total bank assets, respectively.[13] Panel B also presents summary statistics for the variables used in the

[13] The Federal Reserve Bank of St. Louis reports (https://fred.stlouisfed.org/categories/33078) that at the end of 2013, all commercial banks hold $1.6 trillion in commercial and industrial loans, $1.5 trillion in commercial real estate loans, and $2 trillion in residential real estate loans (i.e., home mortgages). Thus, total commercial loans

regressions. Each year, the average bank extends $2.671 million in small business loans in a county. Table 3 shows the distribution of bank-county-year observations by state or territory.

While I predict a reduction in small business lending through the leverage channel, making a directional prediction under the risk management channel requires that I know the sign of the performance covariance between small business and other loans in the data. Following DeYoung et al.'s (2015) methodology, I estimate the expected quarterly returns on small business loans and other loans. For each loan type, I calculate the bank's interest income from the loans, divided by the performing loans at the beginning of a quarter, multiplied by the within-state percentage of the performing loans averaged over the preceding 20 quarters, minus the bank's interest expense on deposits divided by its average deposits during the quarter.[14] For each bank, I regress small business loans' returns on other loans' returns using all quarters during 2007-2013. The performance covariance is measured as the coefficient on other loans' returns if that coefficient is statistically different from zero at the 1 percent level and zero otherwise. I find a mean performance covariance of 0.7 across treatment banks. This suggests a substitute relation between small business loans and other loans. The mean adjusted R^2 of 0.86 indicates that the returns of other loans have a great deal of explanatory power.

I aggregate all non–small business loans into other loans, as a result of a tradeoff between parsimony and goodness-of-fit. On the one hand, since the risk management channel is new to

(including both commercial and industrial loans and commercial real estate loans) amount to $ 3.1 trillion, greater than home mortgages, consistent with Table 2 Panel B.

[14] The Call Reports do not disclose the interest income on or the nonperforming portion of small business loans. To estimate these two variables, I multiply the interest income on commercial loans and nonperforming commercial loans, respectively, by the proportion of small business loans in commercial loans. I subtract the interest income on small business loans (nonperforming small business loans) from the bank's total interest income (total nonperforming loans) to obtain the interest income on other loans (nonperforming other loans). These procedures may add noise to the estimates of returns on small business loans and other loans, which can bias the estimated performance covariance toward zero. In the cross-sectional tests based on the performance covariance in Section V, I use alternative cutoffs to check the robustness of the results.

the accounting literature, this aggregation keeps the development and tests of this channel manageable by reducing the dimensionality. On the other hand, the aggregation may mask information relevant for fitting the returns on small business loans if they covary with the returns on each category of non–small business loans differently. Using the same methodology, I estimate the returns on consumer loans, mortgages, and other non–small business loans (e.g., corporate loans), separately.[15] I regress small business loan returns on the three disaggregated returns during 2007-2013 for each bank. I then construct a ratio of the adjusted R^2 from the specification with the returns of other loans to the adjusted R^2 from the specification with the three disaggregated returns. The mean ratio of 0.93 is not statistically different from one (two-tailed *p*-value = 0.120). This ratio is also greater than one for about 40 percent of treatment banks. The results suggest that the aggregation conceals relevant information to a limited extent.

V. RESULTS

Primary Tests

Table 4 shows the results from the pooled regression estimation. The variable of interest is *Consolidation*. As shown in column (1), given the average ratio of assets in consolidated entities to bank assets (10.7 percent in Table 1), consolidating the average percentage amount of securitized assets reduces lending to small businesses by 13 percent (10.7 percent × 1.218, two-

[15] To obtain the interest income on other non–small business loans, I subtract the interest income on small business loans, consumer loans, and mortgages from the bank's total interest income. Similarly, I subtract the nonperforming small business loans, consumer loans, and mortgages from the bank's total nonperforming loans to obtain other nonperforming non–small business loans.

tailed *p*-value < 0.01).[16] The significant positive coefficient on *Cash flows* suggests that more liquid banks lend more to small businesses.[17]

After matching banks on the amount of securitization, I observe that treatment banks have more credit card securitizations than control banks. Nevertheless, treatment banks do not appear to suffer more from the severe decline in liquidity during the recent financial crisis. The Securities Industry and Financial Markets Association reports that total credit card securitizations decreased from $324 billion in 2007 to $300 billion in 2009, while non-agency securitized loans other than credit cards decreased from $3.8 trillion to $3.3 trillion. Thus, different exposure to liquidity risk is unlikely to explain the results in column (1).

To allay the concern that banks with plans to cut small business loans choose to engage in more credit card securitizations (i.e., reverse causality), I create an IV that is pre-determined well ahead of SFAS 166 and 167. This variable (*Offcard*) equals a bank's securitized credit card receivables divided by total assets in 2001 for its 2010-2013 observations, and zero for its 2007-2009 observations. The credit card securitization data from Schedule RC-S of the Call Reports first became available in 2001. This variable denotes the bank's exposure to credit card securitization in 2001 times an indicator variable for the post-SFAS 166/167 period, with the main effects of the exposure and the indicator being absorbed by the bank- and county-year fixed effects, respectively. As shown in column (2) of Table 4, this IV (*Offcard*) strongly predicts

[16] The finding is robust to (1) matching banks on *Assets*, *Noncommercial loan*, and the propensity score based on *Securitization*, *Assets*, and *Noncommecial loan*, and (2) keeping only treatment banks (untabulated). The finding is also robust to excluding banks with non-zero consolidated ABCP conduits (untabulated), which suggests that bank regulators' elimination of the ABCP exclusion does not drive the results.

[17] Although the coefficients on bank size (*Assets*) and loan performance (*Commercial nonperf*) are statistically insignificant, the sign of the coefficients is as expected: larger banks and banks with more problem loans lend less to small businesses. The lack of statistical significance is likely because these variables have large cross-sectional but small temporal variations. The inclusion of bank fixed effects absorbs the former and thus leaves insufficient statistical power. In contrast, since I exploit a shock to the test variable (*Consolidation*), the substantial change in *Consolidation* will not be absorbed by the bank fixed effects. If I drop bank fixed effects, both *Assets* and *Commercial nonperf* load significantly negatively (two-tailed *p*-value < 0.05 and 0.1, respectively).

Consolidation (two-tailed *p*-value < 0.01) during the first stage regression. The instrumented *Consolidation* continues to load significantly negatively in the second stage (two-tailed *p*-value < 0.1). These results suggest that reverse causality is unlikely to explain the results in column (1).

A key assumption underlying the difference-in-differences design is that treatment and control banks would exhibit parallel trends in small business lending in the absence of the new rules. I conduct two additional analyses to validate this assumption. First, I map out the effect over the sample period. Specifically, I create an indicator variable ($Treat_i$) equal to one for treatment banks, and zero for control banks. I then interact $Treat_i$ with an indicator for each year except for the year immediately before the new rules took effect, which makes 2009 the benchmark period (i.e., $Y2007_t$, $Y2008_t$, $Y2010_t$, $Y2011_t$, $Y2012_t$, and $Y2013_t$). I replace *Consolidation* with these interaction terms (the main effects of $Treat_i$ and year indicators are absorbed by bank and county-year fixed effects). The estimated coefficient on each interaction and its two-tailed 90 percent confidence interval are plotted in Figure 1. The treatment effects in the pre-periods are small and statistically indistinguishable from the benchmark period, consistent with the parallel-trends assumption. The treatment effect takes place quickly after the adoption of the new rules.[18]

Second, I estimate a traditional difference-in-differences model with $Treat_i \times Post_t$ as the test variable, where $Post_t$ equals one for 2010-2013 and zero otherwise. More importantly, I add $Treat_i \times Trend_t$, where $Trend_t$ is a time trend variable (equal to one for 2007, two for 2008, and so on) to the regression to control for divergent linear trends between treatment and control

[18] The difference between the coefficient on *Treat×Y2007* and the coefficient on *Treat×Y2008* is statistically insignificant (two-tailed *p*-value = 0.40). The difference between the coefficient on *Treat×Y2008* and the coefficient on *Treat×Y2010* is statistically significant (two-tailed *p*-value = 0.01). The difference between the coefficient on *Treat×Y2010* and the coefficient on each interaction after 2010 is statistically insignificant. The persistence of the treatment effects is consistent with findings in Berger et al. (2008) that banks slowly adjust capital ratios to desired levels due to sizable adjustment costs. They estimate an average annual adjustment speed of 45 percent, which implies that a bank will close 91 percent of the gap to its target in four years (i.e., $1 - (1 - 0.45)^4 = 0.9084$).

banks. As shown in column (3) of Table 4, $Treat_i \times Post_t$ loads significantly negatively (two-tailed p-value < 0.05). Thus, it is unlikely that divergent linear trends explain the results.

Cross-sectional Tests

Downward pressure on regulatory capital ratios and strength of market discipline

Given the finding that the leverage channel dominates on average, I test two cross-sectional predictions that consolidating banks with more downward pressure on capital ratios and market discipline reduce small business lending more strongly. For each treatment bank, I measure the downward pressure as a ratio. The numerator captures the impact of SFAS 166/167 adoption on the bank's tier 1 risk-based capital ratios: the difference between the as-if ratio (i.e., the ratio as if SFAS 166/167 had not been implemented) and the ratio as reported at the end of 2011Q1. The denominator reflects how close the bank is to the regulatory minimum in the absence of any real actions by the bank (i.e., the difference between the ratio immediately before the adoption of the new rules and the well-capitalized regulatory minimum). I estimate an expanded equation (1) that includes interactions of all the independent variables with an indicator (*High pressure on tier 1 capital ratios*) set to one for treatment banks with above-median downward pressure, and zero otherwise. Bank fixed effects absorb the main effect of this indicator. Column (1) of Table 5 Panel A reports that the coefficient on *Consolidation*×*High pressure on tier 1 capital ratios* is significantly negative (two-tailed p-value < 0.01).

I measure the strength of market discipline using uninsured deposits since uninsured depositors are major capital providers who monitor and discipline banks (Lo 2015; Akins, Dou, and Ng 2017). Following Berger and Turk-Ariss (2015), I compute uninsured deposits as the amount of bank deposit accounts with a balance of more than $250,000 minus the number of such deposit accounts times $250,000, plus foreign deposits, divided by bank assets. On average,

uninsured deposits equal 18 percent of bank assets. For each treatment bank, I calculate the average uninsured deposits during the sample period. I then estimate an expanded equation (1) that includes interactions of all the independent variables with an indicator (*High market discipline*) set to one for treatment banks with above-median average uninsured deposits, and zero otherwise. Bank fixed effects absorb the main effect of this indicator. Column (2) of Table 5 Panel A reports that the coefficient on *Consolidation*×*High market discipline* is significantly negative (two-tailed p-value < 0.1).[19] Together, the results are consistent with the expectation that consolidating banks with more downward pressure on capital ratios and market discipline decrease small business lending significantly more.

Loan performance covariance

Next, I examine the risk management channel by exploring the cross-sectional variation in the performance covariance between small business loans and other loans as estimated at the end of Section IV. As the performance covariance increases, the incentive to reduce other loans increases banks' willingness to supply small business loans more strongly, which offsets their incentives to cut these loans in the leverage channel. I predict that the reduction in small business lending is weaker for banks with higher loan performance covariance. I estimate an expanded equation (1) that includes interactions of all the independent variables with an indicator (*High covariance*) set to one for treatment banks with above-median performance covariance, and zero otherwise. Bank fixed effects absorb the main effect of this indicator. Column (1) of Table 5 Panel B reports that the coefficient on *Consolidation*×*High covariance* is significantly positive

[19] The finding is robust to using three alternative measures motivated by the idea that credit rating agencies and institutional investors in the subordinated debt market also discipline banks (Dou, Liu, Richardson, and Vyas 2014; Berger and Turk-Ariss 2015; Ertan et al. 2017). Specifically, I distinguish treatment banks based on whether they have a credit rating of "BBB-" (on the verge of being downgraded to a non-investment grade), whether they have negative outlooks or on negative credit watch, and whether they have above-median subordinated debt divided by total assets. Banks with each of these attributes should experience greater market discipline than those without such an attribute and thus reduce small business lending more. The results support these predictions (untabulated).

(two-tailed *p*-value < 0.1). The sum of the coefficients on *Consolidation* and *Consolidation*×*High covariance* is statistically insignificant (two-tailed *p*-value = 0.315). The results suggest that for banks with above-median performance covariance, the incentive to increase small business lending in the risk management channel roughly offsets the incentive to cut small business loans in the leverage channel.

To further explore the risk management channel, I create another indicator variable (*High covariance top decile*) set to one for treatment banks with above the 90th percentile (1.19) of the performance covariance, and zero otherwise. As shown in column (2) of Table 5 Panel B, *Consolidation*×*High covariance top decile* loads significantly positively (two-tailed *p*-value < 0.01). More importantly, the sum of the coefficients on *Consolidation* and *Consolidation*×*High covariance top decile* is significantly positive (two-tailed *p*-value = 0.010). The results suggest that for banks with sufficiently high performance covariance, the incentive to increase small business lending dominates, which provides support for the risk management channel.[20]

Collectively, the cross-sectional results are consistent with both the leverage and the risk management channels underlying the spillover effect. Notably, the two variables for the risk management channel (*High covariance* and *High covariance top decile*) are not significantly correlated with either of the two variables for the leverage channel (*High pressure on tier 1 capital ratios* and *High market discipline*; untabulated). Thus, the two sets of cross-sectional tests are independent of each other.

Implications for Commercial Loan Quality and Small Business Growth

The results so far suggest an average reduction in small business lending after the consolidation under SFAS 166 and 167. Next, I examine the implications of the consolidation for

[20] The results are robust to using the 75th percentile (1.04) and one as alternative covariance cutoffs (untabulated). The latter cutoff (i.e., one) is motivated by the loan portfolio model in Appendix A.

banks and the local economy.[21] During the deleveraging process, banks may improve loan quality by cutting riskier small business loans (Ertan et al. 2017). Testing this prediction is challenging because CRA reports do not contain loan performance data by county, which precludes the preferred within-county-year comparison. Nevertheless, I use all the bank-years in my sample (1,255 observations) and regress the fraction of commercial loans that are nonperforming on $Consolidation_{it\text{-}1}$, bank variables as in equation (1), and bank and year fixed effects. Panel A of Table 6 reports a significant negative coefficient on $Consolidation_{it\text{-}1}$ (two-tailed p-value < 0.01), which suggests an improvement in the quality of commercial lending.

To examine the impact of the consolidation on local aggregate lending to and the growth of small businesses, I use the full sample before the matching procedure in Section IV. I compute the market share of consolidating banks' small business lending at the beginning of year t for county c in 2010-2013 ($Consolidation_{ct\text{-}1}$) and total small business lending in that county-year ($Small\ business\ lending_{ct}$). I also calculate the percentage change in the number of business establishments with fewer than 20 employees ($\%\Delta\ Num\ of\ small\ businesses_{ct}$), since Jayaratne and Strahan (1998) designate these establishments as bank-dependent borrowers. On average, small businesses in a county receive about $61 million of loans, and a county experiences a 0.3 percent decline in the number of small businesses.

The total lending to and growth of small businesses are each regressed on $Consolidation_{ct\text{-}1}$, county characteristics, and county and year fixed effects. County characteristics include the logs of population, number of employees, and total wages, which capture local lending opportunities. Columns (1) and (2) in Table 6 Panel B show that $Consolidation_{ct\text{-}1}$ loads significantly negatively (two-tailed p-value < 0.05). Column (2) shows

[21] Since the model in Appendix A does not provide guidance as to how the two channels influence loan quality and small business growth, I examine only the average effect in this section and the analyses are exploratory.

that an interquartile increase in the market share of consolidating banks is associated with a 12.5 percent ((0.572-0.153) × 0.298) fall in total small business lending. Thus, non-consolidating banks do not fully make up for the cutbacks by consolidating banks, likely due to the sizeable costs of funding, information systems, and personnel that are necessary for expansion (Jayaratne and Strahan 1998). Columns (3) and (4) in Panel B show that an interquartile increase in the market share of consolidating banks is associated with a 0.4 percent ((0.572-0.153) × 0.01) decline in small business growth. This decline accounts for 10 percent (0.4 percent / [0.015-(-0.024)]) of the interquartile range movement in the dependent variable (*%Δ Num of small businesses*$_{ct}$), an economically meaningful effect.[22]

VI. CONCLUSION

I investigate how the consolidation of securitization entities under SFAS 166 and 167 spills over to banks' small business lending. In the leverage channel, the consolidation pressures banks to downsize their entire loan portfolios. In the risk management channel, as the returns on small business loan covary positively with those on other loans, the incentive to reduce other loans via the leverage channel increases banks' willingness to supply small business loans.

I find that banks that consolidate more assets in securitization entities reduce lending to small businesses, which suggests that the leverage channel dominates on average. Consistent with this channel, the reduction is more salient for banks with higher downward pressure on regulatory capital ratios due to consolidation and more market discipline. Most importantly, I identify a small group of banks with sufficiently positive performance covariance that increase small business lending, which supports the risk management channel. After the new rules, the

[22] Bord, Ivashina, and Taliaferro (2018) find a 0.8 percent drop in small business growth in 2007-2009 for counties exposed to the real estate shock (see their Panel A of Table 9). Their estimate is comparable to the 0.4 percent drop in small business growth documented here, or a 1 percent drop in small business growth associated with a change in *Consolidation*$_{ct\text{-}1}$ from zero to one (Bord et al.'s test variable is an indicator that changes from zero to one).

average quality of commercial loans of consolidating banks improves, and the average lending to and growth of small businesses in a county where consolidating banks have greater market share declines. Taken together, the findings enhance our understanding of the scope and nature of the real effects of securitization accounting.

APPENDIX A
A Simple Loan Portfolio Model

The adoption of SFAS 166 and 167 leads to the consolidation of securitization entities onto banks' financial statements. To demonstrate how this consolidation affects banks' small business loans, which are rarely securitized, I provide a simple portfolio model of bank loan supply based on DeYoung et al.'s (2015) framework.[23]

In period 1, a bank chooses its asset portfolio of small business loans (NL_1) and other loans (i.e., all non–small business loans; NL_2). The asset portfolio is funded by Fc of equity and $F(1 - c)$ of debt, with c being the *economic* capital ratio ($NL_1 + NL_2 = F$). In this model, small business loans cannot be securitized, whereas a $s > 0$ fraction of other loans are securitized. In other words, sNL_2 of other loans are funded purely by debt (i.e., asset-backed securities, which are part of the total debt financing $F(1 - c)$). Prior to the adoption of SFAS 166 and 167, neither the securitized loans nor the asset-backed securities are recognized on the bank's balance sheet. As a result, the *book* capital ratio is calculated as $\frac{Fc}{NL_1+(1-s)NL_2} = \frac{[NL_1+NL_2]c}{NL_1+(1-s)NL_2}$. By assumption, the bank must meet the target book capital ratio (c^*) by the end of the first period. Clearly, the economic capital ratio is lower than the target book capital ratio due to the securitization activity and its off–balance sheet status: $\frac{[NL_1+NL_2]c}{NL_1+(1-s)NL_2} = c^* \Rightarrow c = \frac{[NL_1+(1-s)NL_2]c^*}{NL_1+NL_2} < c^*$.[24]

In period 2, the costs of capital are incurred, and the returns on loans are realized. Specifically, the gross per dollar cost of debt is $1 + r$. The gross per dollar cost of equity funding

[23] My model differs from DeYoung et al.'s (2015) in three ways. (1) I do not incorporate the same-sector and cross-sector overhang effects because these effects are unique to community banks, which cannot securitize existing loans. (2) I focus on only two lending sectors for parsimony: small business loans and other loans. (3) I model the equity premium, which is motivated by banking literature and allows bank leverage to play a role in lending decisions.

[24] Suppose a bank holds $100 million in on–balance sheet loan assets ($20 million in small business loans and $80 million in other loans) funded by $90 million of debt (e.g., deposits and other liabilities) and $10 million of equity on the balance sheet. The bank also originated and securitized $10 million of other loans funded by $10 million of asset-backed securities (i.e., debt) through an unconsolidated entity before SFAS 166/167. The bank meets the target book capital ratio (c^*) of 10 percent (10/100) and have the economic capital ratio (c) of 9.1 percent (10/110).

is $1 + r + e$, with $e > 0$ representing the equity premium, which is substantial for banks (see Adrian and Shin (2011) for empirical evidence and Stein (1998) for an adverse selection model). The total dollar cost of capital for the bank is $Fc(1 + r + e) + F(1 - c)(1 + r) = F(1 + r + ce)$. The gross per dollar return on small business loans is $\tilde{R}_1 = 1 + p_1 - \tilde{\eta}_1$, where p_1 is the per dollar interest rate and $\tilde{\eta}_1$ is the random per dollar loan losses on small business loans: $\tilde{\eta}_1 \sim N(\mu_1, \sigma_{11})$. Similarly, the gross per dollar return on other loans is $\tilde{R}_2 = 1 + p_2 - \tilde{\eta}_2$, where p_2 is the per dollar interest rate and $\tilde{\eta}_2$ is the random per dollar loan losses on other loans: $\tilde{\eta}_2 \sim N(\mu_2, \sigma_{22})$. I denote the variance of $\tilde{\eta}_1$, the variance of $\tilde{\eta}_2$, and the covariance between the two variables as σ_{11}, σ_{22}, and σ_{12}, respectively.

Froot and Stein (1998) demonstrate that because of capital market imperfections, a value-maximizing bank makes a lending decision in a risk-averse manner. The bank cares about both the mean and the variance of returns on its loan portfolio. Thus, following DeYoung et al. (2015), I denote the indirect form of the bank's objective function as $P(W)$ with $P_W > 0$ and $P_{WW} < 0$, where the subscript denotes the partial derivative. W is the total wealth of the bank at the end of period 2. Thus, by the end of period 1 (before W is realized), it follows:

$$\begin{aligned}\tilde{W} &= NL_1 \tilde{R}_1 + NL_2 \tilde{R}_2 - F(1 + r + ce) \\ &= NL_1(1 + p_1 - \tilde{\eta}_1) + NL_2(1 + p_2 - \tilde{\eta}_2) - (NL_1 + NL_2)(1 + r + ce) \\ &= NL_1(p_1 - \tilde{\eta}_1 - r - ce) + NL_2(p_2 - \tilde{\eta}_2 - r - ce). \qquad \text{(A1)}\end{aligned}$$

By the end of period 1, the bank chooses small business and other loan amounts (NL_1 and NL_2) that maximize expected profit. This leads to the first-order conditions:

$$0 = E\left[P_W \frac{\partial \tilde{W}}{\partial NL_1}\right] = E[P_W(p_1 - \tilde{\eta}_1 - r - ce)] = E[P_W](p_1 - \mu_1 - r - ce) - \mathrm{Cov}(P_W, \tilde{\eta}_1). \qquad \text{(A2)}$$

$$0 = E\left[P_W \frac{\partial \tilde{W}}{\partial NL_2}\right] = E[P_W(p_2 - \tilde{\eta}_2 - r - ce)] = E[P_W](p_2 - \mu_2 - r - ce) - \mathrm{Cov}(P_W, \tilde{\eta}_2). \qquad \text{(A3)}$$

Since $\tilde{\eta}_1$ and $\tilde{W}$ are both normally distributed, I can apply Stein's Lemma: $\text{Cov}(P_w, \tilde{\eta}_1) = E[P_{ww}]\text{Cov}(\tilde{W}_1, \tilde{\eta}_1) = E[P_{ww}][NL_1\sigma_{11} + NL_2\sigma_{12}]$. Equation (A2) then can be expressed as follows:

$$NL_1 = -NL_2\frac{\sigma_{12}}{\sigma_{11}} + \frac{1}{G}\cdot\frac{p_1 - \mu_1 - r - ce}{\sigma_{11}}, \tag{A4}$$

where $G = -\frac{E[P_{WW}]}{E[P_W]}$ measures the bank's effective risk aversion. Similarly, equation (A3) can be expressed as follows:

$$NL_2 = -NL_1\frac{\sigma_{12}}{\sigma_{22}} + \frac{1}{G}\cdot\frac{p_2 - \mu_2 - r - ce}{\sigma_{22}}. \tag{A5}$$

To obtain a closed-form solution for small business loans, I plug (A5) into (A4), and assume a constant absolute risk aversion function for $P(W) = 1 - e^{-\lambda W}$ so that $\frac{1}{G} = \lambda$:

$$NL_1 = \frac{\lambda\sigma_{11}\sigma_{22}}{\sigma_{11}\sigma_{22} - \sigma_{12}^2}\left[\underbrace{\frac{(p_1 - \mu_1 - r - ce)}{\sigma_{11}}}_{\text{(a) Leverage Channel}} - \underbrace{\frac{(p_2 - \mu_2 - r - ce)}{\sigma_{22}}\frac{\sigma_{12}}{\sigma_{11}}}_{\text{(b) Risk Management Channel}}\right]. \tag{A6}$$

The adoption of SFAS 166 and 167 moves securitized loans and asset-backed securities onto the balance sheet. Consequently, the bank's immediate book capital ratio becomes *c*, below the target book capital ratio (*c**). Extensive banking literature demonstrates that banks actively maintain the capital ratios around target levels (e.g., Berger et al. 2008). Taking this finding as given, the consolidation of securitization entities implies an increase in the economic capital ratio *c*. Such an increase affects the supply of small business loans (NL_1) through two channels:

(a) **Leverage Channel**: Item (a) is the risk-adjusted returns of small business loans. The increase in the economic capital ratio (i.e., the reduction in the economic leverage) after the consolidation increases the fraction of equity financing, which is more expensive. This makes

small business loans less attractive, and thus creates an incentive to reduce the supply of small business loans.[25]

(b) **Risk Management Channel**: Item (b) is the risk-adjusted returns of other loans times the covariance between these two loan types divided by the variance of small business loans. The increase in the economic capital ratio (i.e., the reduction in the economic leverage) also reduces the risk-adjusted returns of other loans, which creates an incentive to decrease these loans. The implication for the supply of small business loans depends on how their returns covary with the returns on other loans. When the covariance σ_{12} is positive (negative), the two types of loans are substitutes (complements) and the reduction in other loans' risk-adjusted returns increases (decreases) the supply of small business loans.

To determine the net effect, I take the first derivative of (A6) with respect to *c*:

$$\frac{\partial NL_1}{\partial c} = \frac{\lambda e \sigma_{22}}{\sigma_{11}\sigma_{22} - \sigma_{12}^2}\left(\frac{\sigma_{12}}{\sigma_{22}} - 1\right). \qquad \text{(A7)}$$

As $\sigma_{11}\sigma_{22} > \sigma_{12}^2$, I know the item outside of the bracket $\frac{\lambda e \sigma_{22}}{\sigma_{11}\sigma_{22} - \sigma_{12}^2} > 0$. Thus, as *c* increases after the consolidation, small business lending decreases as $\frac{\partial NL_1}{\partial c} < 0$ if $\frac{\sigma_{12}}{\sigma_{22}} < 1$ (i.e., either both channels operate in the same direction when $\frac{\sigma_{12}}{\sigma_{22}} < 0$, or the leverage channel dominates when $0 \le \frac{\sigma_{12}}{\sigma_{22}} < 1$). Conversely, small business lending increases as $\frac{\partial NL_1}{\partial c} > 0$ if $\frac{\sigma_{12}}{\sigma_{22}} > 1$ (i.e., the two channels work in opposite directions and the risk management channel dominates). Note that the performance

[25] For tractability, I model only the regulatory capital adequacy consideration in the leverage effect. While here the bank can issue new equity, repay debt, or do both, one can think of a sufficiently high equity premium *e* that makes the first and third options less desirable than the second one. This is consistent with the finding of Adrian and Shin (2011) that bank equity behaves as the predetermined variable. They attribute the stickiness of bank equity to the severe adverse selection problem in raising new equity (Stein 1998). To model the market discipline consideration in the leverage effect, I can assume that the cost of debt *r* is a continuous decreasing function of the book capital ratio $r=f(c^*)$, $f_{c^*}<0$. The consolidation reduces the book capital ratio, increases the cost of debt, and thus makes small business loans less attractive, which creates an incentive to reduce the supply of small business loans. Thus, the tenor of the conclusion is robust to modelling market discipline explicitly.

covariance $\frac{\sigma_{12}}{\sigma_{22}}$ can be estimated by regressing small business loans' returns on other loans' returns as discussed at the end of Section IV. The findings in Table 5 support these predictions.

While I do not test for changes in other loans, let me comment on them for completeness. One can obtain a closed-form solution for other loans by plugging (A4) into (A5) and take the first derivative with respect to *c*: $\frac{\partial NL_2}{\partial c} = \frac{\lambda e \sigma_{11}}{\sigma_{11}\sigma_{22} - \sigma_{12}^2}\left(\frac{\sigma_{12}}{\sigma_{11}} - 1\right)$. Thus, after the consolidation, non–small business lending decreases if $\frac{\sigma_{12}}{\sigma_{11}} < 1$, and increases if $\frac{\sigma_{12}}{\sigma_{11}} > 1$. It is important to note that the performance covariance as discussed in the text $\frac{\sigma_{12}}{\sigma_{22}}$ differs from $\frac{\sigma_{12}}{\sigma_{11}}$. If the risk management channel dominates in influencing small business loans ($\frac{\sigma_{12}}{\sigma_{22}} > 1$), it cannot dominate in influencing other loans since $\frac{\sigma_{12}}{\sigma_{11}} < 1$; otherwise, the combination of $\frac{\sigma_{12}}{\sigma_{22}} > 1$ and $\frac{\sigma_{12}}{\sigma_{11}} > 1$contradicts $\sigma_{11}\sigma_{22} > \sigma_{12}^2$. Put differently, the consolidation cannot increase both small business lending and other lending through the risk management channel.

In summary, the net effect of consolidating securitization entities on small business lending depends on the performance covariance ($\frac{\sigma_{12}}{\sigma_{22}}$). When the performance covariance is negative, the consolidation unambiguously reduces small business lending. When the performance covariance is positive, the net effect is unclear. If the performance covariance is small, the leverage channel dominates and the consolidation still reduces small business lending. However, if the performance covariance is sufficiently large, the risk management channel dominates and the consolidation increases small business lending.

APPENDIX B
Variable Definitions

Variable	Definition	Source
Small business lending$_{ict}$	Log of total small business lending in thousands of dollars by bank *i* in county *c* and year *t*.	CRA
Consolidation$_{it\text{-}1}$	Total assets in consolidated variable interest entities (sum of rcfdj981 though rcfdj998, rcfdk003 through rcfdk014, and rcfdk030 through rcfdk032) at the beginning of year *t* under SFAS 166 and 167, divided by the consolidating bank's total assets (rcfd2170), and zero otherwise.	Call Reports (Schedule RC-V)
Offcard$_{it}$	A bank's securitized credit card receivables (rconb707) divided by total assets (rcfd2170) in 2001 for its 2010-2013 observations, and zero for its 2007-2009 observations (i.e., exposure to credit card securitization in 2001 times an indicator for the post-period.	Call Reports
Treat$_i$	An indicator set to one if the bank ever consolidated any variable interest entity in 2010-2013 under SFAS 166 and 167, and zero otherwise.	Call Reports (Schedule RC-V)
Post$_t$	An indicator set to one for observations in years 2010-2013, and zero otherwise.	Call Reports

Trend$_t$	A count variable equal to one for 2007, two for 2008, and so on.	Call Reports
Securitization	The sum of off–balance sheet securitized assets (rcfdb705 through rcfdb711), assets in consolidated variable interest entities under SFAS 166 and 167 (sum of rcfdj981 though rcfdj998, rcfdk003 through rcfdk014, and rcfdk030 through rcfdk032), and the maximum amount of credit exposure arising from credit enhancements provided to ABCP conduits (rcfdb806), divided by total assets (rcfd2170).	Call Reports
Retained interest	Total retained credit-enhancing interest-only strips (rcfdb712 through rcfdb718) and retained subordinated asset-backed securities (rcfdc393 through rcfdc399), divided by total assets (rcfd2170).	Call Reports
Assets	Log of total assets in millions of dollars (rcfd 2170).	Call Reports
Equity	Total equity (rcfd3210) divided by total assets (rcfd2170).	Call Reports
Stress test	An indicator set to one if the bank or its holding company is subject to the stress test in that year, and zero otherwise.	Federal Reserve Board
Cash flow	Net income (riad4300) before loan loss provisions (riad4230), divided by total assets (rcfd2170).	Call Reports

Deposit	Total deposits (rcfd2200) divided by total assets (rcfd2170).	Call Reports
Commercial nonperf	Nonperforming commercial loans (rcfd3503+rcfd3504 +rcfd1607+rcfd1608) divided by total commercial loans (rcfd1600+rcon1480).	Call Reports
Noncommercial loan	Total loans (rcfd1400) minus commercial loans divided by total assets (rcfd 2170). Commercial loans include both commercial and industrial loans (rcfd1600) and commercial real estate loans (rcon1480).	Call Reports
Small business lending$_{ct}$	Log of total small business lending in thousands of dollars in county *c* and year *t*.	CRA
%Δ Num of small businesses$_{ct}$	The percentage change in the number of small businesses, defined as business establishments with fewer than 20 employees.	Census Business Patterns
Consolidation$_{ct\text{-}1}$	The market share of consolidating banks' small business lending at the beginning of year *t*.	Call Reports
Population	Log of total population.	Bureau of Labor Statistics
Employment	Log of the total employees.	Bureau of Labor Statistics
Wage	Log of total wages.	Bureau of Labor Statistics

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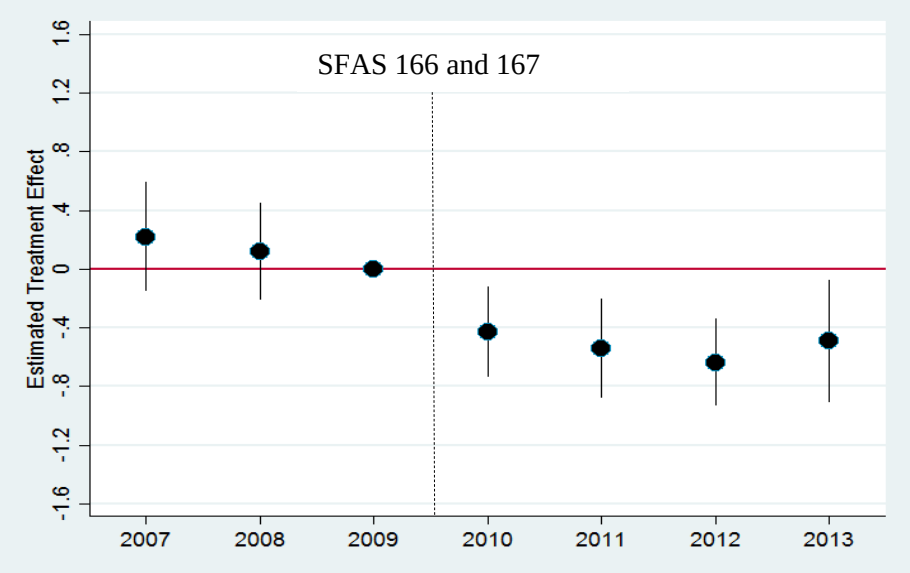
FIGURE 1
Pattern of the Treatment Effects



The figure shows OLS regression coefficient estimates and two-tailed 90 percent confidence intervals based on standard errors two-way clustered by bank and county-year. To map out the pattern of the treatment effects, I interact an indicator equal to one for treatment banks and zero for control banks with an indicator for each year in the sample except for 2009, which serves as the benchmark year (i.e., the coefficient is constrained to equal zero). The plotted coefficient on each interaction represents the treatment effect relative to the benchmark year.

TABLE 1
Assets in Consolidated Securitization Entities

Variable	Mean	Std	Q1	Median	Q3
Bank assets ($ billions)	188.083	384.052	10.788	67.055	162.510
Bank equity ($ billions)	20.653	37.890	1.281	9.388	23.690
Assets in consolidated entities ($ billions)	14.493	26.714	0.074	0.752	11.842
Securitization Vehicles ($ billions)	12.083	25.196	0.000	0.240	6.959
ABCP Conduits ($ billions)	1.275	4.657	0.000	0.000	0.000
Other VIEs ($ billions)	0.876	2.604	0.000	0.000	0.155
Assets in consolidated entities / Bank assets	0.107	0.206	0.002	0.017	0.042
Loans in consolidated entities / Bank assets	0.099	0.198	0.000	0.015	0.039

The table presents descriptive statistics for assets in consolidated securitization entities as of 2011Q1. The consolidation data are not available for 2010. *Bank assets* is the dollar amount of total assets of consolidating banks in billions. *Bank equity* is the dollar amount of total equity of consolidating banks in billions. *Assets in consolidated entities* is the dollar amount of assets in consolidated securitization entities in billions. *Securitization Vehicles* is the dollar amount of assets in consolidated securitization vehicles in billions. *ABCP Conduits* is the dollar amount of assets in consolidated ABCP conduits in billions. *Other VIEs* is the dollar amount of assets in other consolidated variable interest entities in billions. *Loans in consolidated entities* is the dollar amount of loan assets in consolidated securitization entities in billions.

TABLE 2
Descriptive Statistics

Panel A: Assessment of matching

	Before Effective Year (2007-2009)			After Effective Year (2010-2013)			
	Treatment mean (1)	Control mean (2)	Diff. (2)–(1)	Treatment mean (3)	Control mean (4)	Diff. (4)–(3)	Diff in Diff [(4)–(3)] – [(2)–(1)]
Securitization	0.399	0.301	0.098	0.273	0.202	0.071	-0.027
			(0.326)			(0.443)	(-0.090)
Retained interest	0.025	0.006	0.019	0.008	0.004	0.004	-0.015
			(1.326)			(0.860)	(-1.238)
Assets	10.659	9.457	1.202	11.327	9.246	2.081	0.879
			(1.668)			(5.133)	(1.481)
Equity	0.134	0.155	-0.021	0.133	0.138	-0.006	0.015
			(-0.668)			(-0.411)	(0.511)
Stress test	0.000	0.000	0.000	0.427	0.404	0.023	0.023
			.			(0.157)	(0.157)
Cash flow	0.032	0.033	-0.001	0.029	0.032	-0.003	-0.002
			(-0.112)			(-0.477)	(-0.241)
Deposit	0.612	0.477	0.135	0.674	0.528	0.147	0.012
			(0.946)			(1.033)	(0.174)
Commercial nonperf	0.012	0.010	0.002	0.022	0.019	0.003	0.001
			(0.540)			(0.625)	(0.197)
Noncommercial loan	0.493	0.367	0.126	0.499	0.472	0.027	-0.100
			(1.562)			(0.454)	(-1.432)

Panel B: Summary statistics

Loan composition	N	Mean	Std	Q1	Median	Q3
Bank loan assets / Bank assets	1,255	66%	15%	58%	68%	76%
Commercial loans / Bank assets	1,255	30%	14%	22%	29%	38%
Small business loans origination / Bank assets	1,255	6%	12%	2%	4%	7%
Small business loans outstanding / Bank assets	1,255	18%	37%	7%	13%	21%
Home mortgages / Bank assets	1,255	16%	11%	8%	15%	22%
Consumer loans / Bank assets	1,255	7%	13%	1%	2%	6%
Variables in regression analyses						
Consolidation	237,154	0.035	0.108	0.000	0.000	0.000
Securitization	237,154	0.236	0.479	0.000	0.006	0.191
Retained interest	237,154	0.009	0.026	0.000	0.000	0.001
Assets	237,154	10.191	1.655	8.541	10.543	11.763
Equity	237,154	0.139	0.068	0.098	0.127	0.165
Stress test	237,154	0.241	0.427	0.000	0.000	0.000
Cash flow	237,154	0.031	0.023	0.013	0.020	0.049
Deposit	237,154	0.577	0.269	0.518	0.675	0.755
Commercial nonperf	237,154	0.016	0.016	0.007	0.012	0.021
Noncommercial loan	237,154	0.462	0.199	0.355	0.444	0.586
Small business lending ($ thousand)	237,154	2,671	14,402	35	148	742
Small business lending (after taking log)	237,154	5.183	2.206	3.584	5.004	6.611

The table presents the results of an assessment of matching in Panel A with *t*-statistics in parentheses. Summary statistics for loan composition and variables used in regressions are in Panel B. All variables used in regressions are defined in Appendix B.

TABLE 3
Sample Distribution

State	# of bank-county-years	State	# of bank-county-years	State	# of bank-county-years
Alabama	2,724	Maine	1,372	Pennsylvania	7,880
Alaska	2,038	Maryland	3,428	Rhode Island	190
Arizona	1,770	Massachusetts	1,316	South Carolina	3,452
Arkansas	2,776	Michigan	9,580	South Dakota	2,226
California	7,150	Minnesota	7,028	Tennessee	3,622
Colorado	6,450	Mississippi	2,146	Texas	17,850
Connecticut	768	Missouri	7,228	Utah	1,280
Delaware	566	Montana	4,646	Vermont	2,256
D.C.	176	Nebraska	8,698	Virginia	10,138
Florida	5,918	Nevada	1,746	Washington	2,384
Georgia	9,638	New Hampshire	1,186	West Virginia	2,862
Hawaii	380	New Jersey	2,532	Wisconsin	2,904
Idaho	2,002	New Mexico	3,154	Wyoming	2,144
Illinois	6,426	New York	8,880	American Samoa	8
Indiana	5,358	North Carolina	5,422	Guam	40
Iowa	9,590	North Dakota	2,816	Northern Mariana Islands	6
Kansas	9,792	Ohio	9,226	Puerto Rico	1,958
Kentucky	12,342	Oklahoma	5,548	Virgin Islands	62
Louisiana	2,378	Oregon	1,698	Total:	237,154

The table presents the distribution of observations by state or territory. Each observation represents the total lending to small businesses by a bank in a county-year.

TABLE 4
The Effect of Consolidation on Small Business Lending

	Small business lending$_{ict}$		
	Baseline Model	IV Approach 2nd Stage	Diff-in-Diff Control for trends
	(1)	(2)	(3)
Consolidation$_{it\text{-}1}$	-1.218**	-1.547*	
	(2.12)	(1.76)	
Treat$_i$ × *Post*$_t$			-0.423**
			(1.99)
Treat$_i$ × *Trend*$_t$			-0.071
			(1.06)
Securitization$_{it\text{-}1}$	-0.416	-0.361	-0.630
	(0.82)	(0.69)	(1.63)
Retained interest$_{it\text{-}1}$	5.446	4.989	5.648
	(0.95)	(0.83)	(1.30)
Assets$_{it\text{-}1}$	-0.582	-0.576	-0.399**
	(1.53)	(1.47)	(2.31)
Equity$_{it\text{-}1}$	-2.786	-2.871	-1.300
	(1.34)	(1.41)	(0.94)
Stress test$_{it\text{-}1}$	0.043	0.042	0.096
	(0.29)	(0.28)	(0.76)
Cash flow$_{it\text{-}1}$	13.601**	12.901*	15.219***
	(2.03)	(1.75)	(3.39)
Deposit$_{it\text{-}1}$	0.619	0.579	0.858*
	(0.94)	(0.86)	(1.91)
Commercial nonperf$_{it\text{-}1}$	-0.438	-0.530	-0.487
	(0.12)	(0.15)	(0.19)
Noncommercial loan$_{it\text{-}1}$	0.597	0.624	0.441
	(1.16)	(1.11)	(0.80)
County-Year FE	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
1st Stage Coeff. on IV (*Offcard*)		0.393***	
		(5.76)	
Weak IV F-statistics		33.201	
Observations	237,154	237,154	237,154
Adj. R-squared	0.599	0.599	0.600

The table presents coefficients and *t*-statistics in parentheses, from pooled regressions of *Small business lending*$_{ict}$ on the independent variables listed. See Appendix B for variable definitions. Standard errors are two-way clustered by bank and county-year. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 5
Interaction Effects

Panel A: The effect of regulatory capital adequacy and market discipline on the relation between consolidation and small business lending

	Small business lending$_{ict}$	
	(1)	(2)
Consolidation$_{it-1}$	0.220	-1.065*
	(0.54)	(1.71)
Consolidation$_{it-1}$ × *High pressure on tier 1 capital ratios*	-3.861***	
	(6.17)	
Consolidation$_{it-1}$ × *High market discipline*		-1.701*
		(1.86)
Controls	Yes	Yes
Controls × *High pressure on tier 1 capital ratios*	Yes	No
Controls × *High market discipline*	No	Yes
County-Year FE	Yes	Yes
County-Year FE × *High pressure on tier 1 capital ratios*	Yes	No
County-Year FE × *High market discipline*	No	Yes
Bank FE	Yes	Yes
p-value of the sum of coefficients:		
Consolidation$_{it-1}$ +		
Consolidation$_{it-1}$ × *High pressure on tier 1 capital ratios*	<0.01	
Consolidation$_{it-1}$ +		
Consolidation$_{it-1}$ × *High market discipline*		<0.01
Observations	237,154	237,154
Adj. R-squared	0.625	0.622

Panel B: The effect of loan performance covariance on the relation between consolidation and small business lending

	Small business lending$_{ict}$	
	(1)	(2)
Consolidation$_{it-1}$	-1.343**	-1.407**
	(2.34)	(2.43)
Consolidation$_{it-1}$ × *High covariance*	2.475*	
	(1.96)	
Consolidation$_{it-1}$ × *High covariance top decile*		5.843***
		(3.19)
Controls	Yes	Yes
Controls × *High covariance*	Yes	No
Controls × *High covariance top decile*	No	Yes
County-Year FE	Yes	Yes
County-Year FE × *High covariance*	Yes	No
County-Year FE × *High covariance top decile*	No	Yes
Bank FE	Yes	Yes
p-value of the sum of coefficients:		
Consolidation$_{it-1}$ +	0.315	
Consolidation$_{it-1}$ × *High covariance*		
Consolidation$_{it-1}$ +		0.010
Consolidation$_{it-1}$ × *High covariance top decile*		
Observations	237,154	237,154
Adj. R-squared	0.620	0.617

The two panels present coefficients and *t*-statistics in parentheses, from pooled regressions of *Small business lending*$_{ict}$ on the independent variables listed. Controls represent all control variables in Table 4 column 1. See variable definitions in Appendix B. Panel A presents results when all independent variables are interacted with *High pressure on tier 1 capital ratios* and *High market discipline*, respectively. *High pressure on tier 1 capital ratios* is

set to one for banks with above-median downward pressure on tier 1 capital ratios, and zero otherwise. The downward pressure is calculated as the impact of consolidation on the tier 1 risk-based capital ratios of treatment banks divided by the difference between the ratio immediately before the adoption of the new rules and the well-capitalized regulatory minimum. *High market discipline* is set to one for banks with above-median uninsured deposits, and zero otherwise. Uninsured deposits are calculated as the amount of bank deposit accounts with a balance of more than $250,000 minus the number of such deposit accounts multiplied by $250,000, plus the foreign deposits divided by total assets. Panel B presents results when all independent variables are interacted with *High covariance* and *High covariance top decile*, respectively. *High covariance* is set to one for banks with above-median performance covariance between small business loans and other loans, and zero otherwise. The performance covariance is calculate as the bank-specific regression coefficient of small business loans' returns on other loans' returns using all quarters during 2007-2013. *High covariance top decile* is set to one for banks with above the 90th percentile of performance covariance between small business loans and other loans, and zero otherwise. Standard errors are two-way clustered by bank and county-year. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.

TABLE 6
Implications for Commercial Loan Quality and Local Economy

Panel A: Consolidation and commercial loan quality

	Commercial nonperf$_{it}$
	(1)
Consolidation$_{it-1}$	-0.039***
	(5.88)
Securitization$_{it-1}$	0.018
	(1.25)
Retained interest$_{it-1}$	-0.251
	(0.99)
Assets$_{it-1}$	-0.000
	(0.19)
Equity$_{it-1}$	-0.022
	(0.87)
Stress test$_{it-1}$	-0.001
	(0.40)
Cash flow$_{it-1}$	0.047
	(0.61)
Deposit$_{it-1}$	-0.007
	(0.48)
Commercial nonperf$_{it-1}$	0.476**
	(3.66)
Noncommercial loan$_{it-1}$	-0.005
	(0.67)
Year FE	Yes
Bank FE	Yes
Two-way Clustering	Yes
Observations	1,225
Adj. R-squared	0.704

Panel B: Consolidation, aggregate credit supply, and small business growth

	Small business lending$_{ct}$		*%Δ Num of small businesses*$_{ct+1}$	
	(1)	(2)	(3)	(4)
Consolidation$_{ct-1}$	-0.296**	-0.298**	-0.010*	-0.010*
	(3.75)	(3.80)	(2.60)	(2.64)
Population$_{ct}$		1.470**		-0.094
		(4.96)		(2.29)
Employment$_{ct}$		0.052		-0.004
		(0.87)		(0.62)
Wage$_{ct}$		-0.013		-0.002
		(0.67)		(0.88)
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	12,500	12,500	12,500	12,500
Adj. R-squared	0.973	0.973	0.009	0.011

The tables present coefficients and *t*-statistics in parentheses, from pooled regressions of the dependent variables shown in each column header on the independent variables listed. Panel A presents results for commercial loan performance at the bank-year level. Control variables are defined the same as in Table 4. Standard errors are two-way clustered by bank and year. Panel B presents results for aggregate small business lending and the growth of the number of small businesses at the county-year level. Standard errors are two-way clustered by county and year. See Appendix B for variable definitions. *, **, and *** denote two-tailed statistical significance at the 10%, 5%, and 1% levels, respectively.