The Rise of Finance Companies and FinTech Lenders in Small Business Lending

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Abstract

We document that finance companies and FinTech lenders increased lending to small businesses after the 2008 financial crisis. We show that most of the increase substituted for a reduction in lending by banks. In counties where banks had a larger market share before the crisis, finance companies and FinTech lenders increased their lending more. By 2016, the increase in finance company and FinTech lending almost perfectly offset the decrease in bank lending. We control for firms' credit demand by examining lending by different lenders to the same firm, by comparing firms within the same narrow industry, and by comparing firms pledging the same type of collateral. Consistent with the substitution of bank lending with finance company and FinTech lending, we find that reduced bank lending had no effect on employment, wages, new business creation, or business expansion. Our results show that finance companies and FinTech lenders are major suppliers of credit to small businesses and played an important role in the recovery from the 2008 financial crisis.

Keywords: banks, finance companies, small business lending, financial crises

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I Introduction

Business investment in the United States fell by more than 11% from June 2008 to December 2010. It is often asserted that the decline in firm-level investment was caused by a contraction in the supply of business credit due to the 2008 financial crisis. Consistent with this view, total bank lending to firms dropped by more than 20% over the same period. The drop was even larger for lending to small and medium-sized firms, which declined by almost 40% between 2008 and 2010.

Starting in late 2010, firm-level investment and business lending recovered. Total investment increased by 56% from 2010 to 2016, with larger firms borrowing from banks and also raising financing in public and private markets. Yet, bank lending to small and medium-sized firms was never fully restored. The decline was particularly pronounced among the four largest US banks, which reduced their combined annual lending volume by 44%.

The lack of lending raised concerns that banks had permanently reduced the supply of credit to small and medium-sized firms, possibly due to regulatory constraints. A permanent reduction could have severe consequences for economic activity because small and medium-sized enterprises represent more than 95% of all firms and 47.5% of all employment, generating two out of every three new jobs. This concern was widespread and found support among academics, policymakers, the press, and the broader financial community, with some arguing that the slow recovery is caused by a lack of credit available to small and medium-sized firms.

In this paper, we ask whether there was a permanent decline in the supply of credit to small and medium-sized businesses and, if so, whether the decline reduced economic activity. To answer these questions, we combine new data on the universe of secured, non-real estate US business loans with data on local economic activity. We collect the data from Uniform Commercial Code ("UCC") filings covering 11.1 million business loans to 3.3 million firms in the years 2006 to 2016 across all US states. Lenders routinely make UCC filings on all secured loans to preserve priority in bankruptcy.

Our new data is broadly representative of US small business lending and covers both bank and nonbank lenders, including finance companies and FinTech lenders. We find that

the UCC data covers 95% of non-real estate small business lending and 73% of total small business lending, respectively. For comparison, we estimate that the most commonly used dataset on US small business lending ("CRA data") only covers 43% of total lending, primarily because it does not cover small banks or nonbank lenders. Our data is highly disaggregated, with information on the underlying loan, firm, collateral, and lender. Hence, the data allows us to provide a comprehensive picture of the state of US small business lending and its evolution during and after the 2008 financial crisis.

An important finding of our paper is that nonbank lenders provide the majority of US small business loans. Panel A of Figure 1 plots total annual loans originated by banks and nonbank lenders from 2006 to 2016. The figure shows that bank loan origination dropped by 27% between 2007 and 2010. After hitting a trough in 2010, bank lending slowly recovered from 2010 to 2016 but remained sluggish and never returned to trend. At the same time, nonbank lenders greatly expanded their lending. In the aftermath of the financial crisis, nonbank lenders reduced lending by 17%, which was less than the reduction in bank lending. During the recovery period, nonbank lenders expanded annual lending by 69% from 2010 to 2016, significantly more than banks. By the end of 2016, nonbank lenders had a market share of 59% in small business lending.

Panel B of Figure 1 breaks down nonbank lending into lending by finance companies, FinTech lenders, and other nonbank lenders. We find that finance companies are by far the largest nonbank lender. Similar to banks, finance companies reduced lending during the 2008 financial crisis but then greatly increased lending, with total growth of 55% from 2010 to 2016. In contrast, FinTech lenders were effectively nonexistent before 2010 and took off afterward, accounting for almost one-third of the total increase in nonbank loans since 2010. Other nonbank lenders, such as cooperatives, investment companies, and nonfinancial firms providing trade credit also contributed to increased lending after 2010. Taken together, the figure shows a broad-based increase in nonbank lending driven primarily by finance companies and FinTech lenders.

This aggregate evidence raises the question of whether the rise of finance companies and FinTech lenders was caused by a negative shock to the supply of bank lending or by increased demand for specialized loans offered by nonbanks. Under the supply-side explanation, banks

reduced lending in the aftermath of the 2008 financial crisis, and finance companies and FinTech lenders responded by increasing their lending. Under the demand-side explanation, borrowers had a higher demand for specialized loans offered by finance companies and FinTech lenders (e.g., loans tailored to specific industries, collateral, or firm risk) and therefore switched from banks to nonbank lenders.

To answer this question, we turn to the cross-section of lending across US counties. The starting point of our analysis is that the banking sector suffered a negative shock due to the 2008 financial crisis. The negative shock was the result of several factors such as losses incurred during the 2008 financial crisis, tighter regulation of banks, the introduction of bank stress tests for large banks, and banks' reassessment of the validity of their internal risk models. The intuition behind our empirical approach is that the shock was nationwide but played out differently across counties. Counties that relied more on bank lending before the financial crisis experienced a stronger negative shock to bank lending. This regional variation in bank lending created variation in lending opportunities for nonbank lenders that did not face the same constraints as banks. Under the supply-side explanation, nonbank lenders expanded lending more in counties that were more exposed to banks, thereby offsetting the negative shock to bank lending.

Our main result is that nonbank lenders increased lending in areas that were more affected by the bank shock and that increased nonbank lending almost perfectly offset the reduction in bank lending across counties. Specifically, we measure local exposure to the bank shock using the market share of banks *before* the 2008 financial crisis. Comparing a county with a pre-crisis bank market share at the 90th percentile (63% bank share) relative to a county at the 10th percentile (30% bank share), we find an increase in the nonbank market share of 7.2 percentage points (pp) from 2007 to 2016. The effect on total lending (sum of bank and nonbank lending) across counties is a precisely estimated null effect. These results suggest that sluggish growth in bank lending after 2008 did not constrain small businesses. Rather, the "missing" bank lending was replaced by nonbank lending, and small businesses were able to avoid financing constraints by switching across lenders.

A possible identification concern with our result is that bank market share also somewhat captures credit demand. Specifically, if firms in counties with a high bank share have a

higher demand for nonbank loans, our results may at least in part reflect loan demand. We address this concern using several strategies. First, we compare firms operating in the same narrow industry and firms pledging the same type of collateral. If the result is driven by firms' demand for industry- or collateral-specific expertise of finance companies or FinTech lenders, we expect the results to weaken. However, our results are unchanged when we control adding detailed industry-level and collateral controls.

Second, we examine firms that borrow from *both* banks and nonbanks before the 2008 financial crisis and analyze their borrowing after 2008. For these firms, we can exploit variation within firms and thereby control for changes in firms' credit demand. We find that firms are 3.4 pp more likely to get a new loan from a nonbank than they are to get a loan from a bank. Hence, even keeping credit demand at the firm level constant, we find that lending by nonbank lenders replaces bank lending.

Third, we study the substitution from banks to nonbank lenders using three separate natural experiments. The natural experiments exploit variation in bank lending due to banks' exposure to off-balance sheet vehicles, new regulation tied to bank stress tests, and required regulatory capital increases under the 2010 Dodd-Frank Act. All three experiments represent a negative shock to banks' ability to lend. Using cross-county variation, we find that the decline in bank lending induced by these experiments leads to increased nonbank lending and that the increased nonbank lending almost perfectly offsets the decline in bank lending. Hence, three natural experiments using different sources of variation support our main findings.

Fourth, we distinguish between finance companies that are owned by banks versus those owned by nonbanks. Bank-owned finance companies tend to serve similar borrowers as nonbank-owned finance companies but are subject to bank regulation due to their ownership. We find that the lending behaviors of bank-owned finance companies and nonbank-owned finance companies diverged after the 2008 financial crisis. Bank-owned finance companies reduced their lending to the same extent as banks while nonbank-owned finance companies expanded their lending. This result shows that regulatory constraints on bank lending at least partially explain the substitution from banks to finance companies.

To evaluate the consequences for the real economy, we examine the impact of lending on

small business activity. Our results show that nonbank lenders offset the decline in bank lending, suggesting that there should be no effect on the real economy. This is exactly what we find when we examine local small business activity. We find local exposure to the bank shocks had no effect on establishment growth, employment growth, wage growth, or the business expansion rate. The standard errors are sufficiently small to rule out economically significant effects.

In sum, our results document the rise of finance companies and FinTech lenders in the aftermath of the 2008 financial crisis. Nonbank lenders emerged as major providers of capital to small businesses and provide the majority of small business loans in 2016. The increase in lending reduced the negative impact on total credit supply and alleviated the effect of the crisis on the real economy. Hence, finance companies and FinTech lenders played an important role during the recovery from the 2008 financial crisis and can account for "missing" bank lending after 2008.

Our paper relates to three main strands of the literature. First, we contribute to the literature on the impact of the 2008 financial crisis on small businesses. The literature has emphasized that ongoing relationships between lenders and borrowers are particularly important for small businesses and affects their ability to substitute across lenders.[1] Chen, Hanson, and Stein (2017) show that small business lending by the four largest banks remained depressed through 2014, which negatively impacted wages. Bord, Ivashina, and Taliaferro (2018) show that the contraction in credit to small firms led to lower entrepreneurial activity through 2015. Cortés, Demyanyk, Li, Loutskina, and Strahan (2020) document that banks affected by stress tests reduce credit supply and raise interest rates on small business loans. Granja, Leuz, and Rajan (2018) show that the physical distance between banks and small businesses decreased during the crisis. Boot, Hoffmann, Laeven, and Ratnovski (2020) study the effects of technological change on financial intermediation. Greenstone, Mas, and Nguyen (2020) argue switching across banks is costly leading to a decline in new lending but little

[1]For the importance of relationships in bank lending see Bernanke (1983); James (1987); Hoshi, Kashyap, and Scharfstein (1990); Petersen and Rajan (1994); Petersen and Rajan (1995); Berger and Udell (1995); Berger, Saunders, Scalise, and Udell (1998); Petersen and Rajan (2002); Berger, Miller, Petersen, Rajan, and Stein (2005); Degryse and Ongena (2005); Chava and Purnanandam (2011); Bolton, Freixas, Gambacorta, and Mistrulli (2016); DeYoung, Gron, Torna, and Winton (2015); Berger, Bouwman, and Kim (2017). For surveys, see Boot (2000), Ongena and Smith (2000), and Berger and Black (2014).

effect on real outcomes. To the best of our knowledge, our paper is the first to document the role of nonbank lenders in offsetting the decline in bank lending.

Second, our work relates to the literature on the impact of bank lending on the real economy. This work focuses on the role of bank lending in the presence of private information, financial frictions, and collateral constraints (e.g., Bernanke (1983); Khwaja and Mian (2008); Paravisini (2008); Gormley (2010); Rampini and Viswanathan (2010); Amiti and Weinstein (2011); Chava and Purnanandam (2011); Schnabl (2012a); Bolton, Freixas, Gambacorta, and Mistrulli (2016); Jimenez, Ongena, Peydro, and Saurina (2014); Chodorow-Reich (2014); Paravisini, Rappoport, Schnabl, and Wolfenzon (2015); Paravisini, Rappoport, and Schnabl (2015); Drechsler, Savov, and Schnabl (2017); Amiti and Weinstein (2018); and Gilje (2019), Wang, Whited, Wu, and Xiao (2020)). Our findings highlight the role of finance companies and FinTech lenders in offsetting negative shocks to bank lending.

Third, our paper relates to the work on the role of nonbanks or shadow banks. Buchak, Matvos, Piskorski, and Seru (2018) and Buchak, Matvos, Piskorski, and Seru (2020) study the growth of shadow banks in the mortgage market and relate it to regulatory constraints on banks. Fuster, Plosser, Schnabl, and Vickery (2019) show that FinTech lenders use technology to respond more effectively to changes in credit demand and Berg, Burg, Gombović, and Puri (2019) show that FinTech lenders use digital footprints to predict consumer default. Chernenko, Erel, and Prilmeier (2019) document direct lending by nonbanks to mid-sized firms. Irani, Iyer, Meisenzahl, and Peydró (2020) examine the rise of nonbank lenders in the syndicated loan market due to increased bank regulation and Berg, Saunders, and Steffen (2021) summarize changes in trends in corporate borrowing over the last two decades. Balyuk, Berger, and Hackney (2020) examine the growth of FinTech small business lending. Murfin and Pratt (2019) analyze the role of captive finance companies in supporting higher resale values for durable goods. Our paper is the first to focus on the role of nonbank lenders in small business lending.

The rest of the paper is organized as follows. Section II provides background on finance companies and documents their growth in small business lending following the financial crisis. Section III describes our novel data source, Section IV provide summary statistics based on the UCC data, Section V explains our identification strategy and provides the empirical

results, and Section VI concludes.

II The rise of finance companies and FinTech lenders

II.A Background on finance companies

Finance companies are financial firms whose primary business is to lend to consumers and businesses. They are large lenders to US small and medium-sized enterprises, with total business loans of $388.0 billion in 2016.[2] They compete with banks in lending markets but do not issue deposits. Since they do not have deposits and do not benefit from deposit insurance, finance companies are not subject to bank regulation. However, like banks, they are subject to federal and state-level laws and regulations such as usury limits, collection laws, and other laws and restrictions.

Table 1 lists the 20 largest lenders in the US based on UCC data in 2016. The table shows that small business lending is dominated by banks and finance companies, with the market equally split between them. We classify a lender as a bank if the lender is a commercial bank, credit union, thrift, or is owned by a bank holding company (e.g., Wells Fargo Leasing). We classify a lender as a finance company if the finance company is not owned by a bank or bank holding company. The ten largest lenders are a mix of banks (Wells Fargo, US Bank, J.P. Morgan Chase Bank, Bank of America, and BB&T) and finance companies (John Deere, CNH Capital America, Kubota Credit Corporation, GE Capital, and Caterpillar).

Among finance companies, we distinguish between captive finance companies and independent finance companies. Captive finance companies are owned by a manufacturer and lend almost exclusively against products produced by the parent company (e.g., John Deere lends primarily against equipment manufactured by John Deere). Independent finance companies are owned neither by a bank nor a manufacturer and lend more broadly (e.g., De Lage Landen, AGCO Finance, or Tower Loan). As discussed in more detail below, the rise of finance company lending was largely driven by independent finance companies while captive finance companies slightly decreased their lending.

[2]See the Federal Reserve release at https://www.federalreserve.gov/releases/g20/20171226/.

Banks are significantly larger than finance companies. The average assets of the 10 largest banks are $807 billion, while the average assets of the 10 largest finance companies are $65 billion. The reason for this vast difference in size is that banks engage in many activities besides small business lending, while finance companies tend to specialize in small business lending. Banks and finance companies are of similar size in terms of small business lending activity. Among the top 20 lenders, the average bank originates 13,308 loans per year relative to 16,969 loans for the average finance company. Similarly, total small business loans held on the balance sheet are $10.28 billion for the 10 largest banks relative to $25.99 billion for the ten largest finance companies.[3]

Banks and finance companies use different sources of financing. Banks are primarily financed with deposits and other short-term debt. Finance companies primarily finance themselves with long-term debt, although some of them also issue short-term commercial paper.[4] The average share of long-term (non-deposit) debt is 25.0% for banks relative to 88.4% for finance companies. As shown by Drechsler, Savov, and Schnabl (2021a), even though deposits are nominally short-term, they effectively constitute long-term financing for banks. Hence, both banks and finance companies use long-term financing, but they come from different sources.

Finance companies are often described as "asset-based" lenders and banks as "cash flow" lenders.[5] The idea being, while underwriting a loan, banks focus more on projected cash flow from operations while finance companies focus on collateral as the ultimate source of payment, monitoring it closely after origination. This can lead to differences in the underlying collateral pledged to the different types of lenders. As discussed in more detail below, we are careful to control for the type of collateral when conducting our empirical analysis.

[3]The data for finance companies is based on the five publicly traded finance companies in Table 1.

[4]In 2015, commercial paper accounted for about 6% of total assets of business lenders, bank loans constituted 17%, loans from the parent company, 18%, and other debt (non-recourse debt and bonds), 27%. See the 2015-2018 Federal Reserve Survey of Finance Companies at https://www.federalreserve.gov/publications/2018-june-survey-of-finance-companies-2015.htm.

[5]Lian and Ma (2021) analyze the extent of asset-based borrowing versus cash-flow-based borrowing among large US non-financial firms. Ivashina, Laeven, and Moral-Benito (2020) distinguish between asset-based loans, cash-flow loans, trade finance, and leasing and show that credit dynamics and banking channels vary across the loan types.

II.B Background on FinTech lenders

We define FinTech lenders as financial firms that primarily lend online and do not take deposits. The legal structure of FinTech lenders is still evolving and may change over time. The most common model is based on partnerships between FinTech lenders and banks. Specifically, a FinTech lender is incorporated as an independent legal entity and partners with a "funding bank." This way, a FinTech lender is not incorporated as a bank and is not subject to bank regulation. FinTech lenders then offer loans online, arrange for the funding bank to make the loans, and purchase the loans from the funding bank at or shortly after origination. The funding bank is usually located in a jurisdiction that reduces regulatory constraints on its operations but makes loans across the County. This structure enables FinTech lenders to offer loans across different US states while minimizing the impact of local regulation.[6]

The main type of FinTech lender in our sample is a Merchant Cash Advance (MCA) lender. MCA lenders make short-term loans repaid through deductions from future credit card and debit card sales. Even though MCA loans are often marketed as unsecured loans, they are registered in the UCC data because many MCA lenders require a blanket lien covering receivables and other business assets. MCA lenders are generally valued for their speed and convenience, but their services come at a steep price. They often require daily payments (a certain percentage of revenues) and charge high interest rates.[7]

Aside from MCA lenders, an increasing number of specialized FinTech lenders offer online loans. These companies provide a broader range of financial services than MCA companies, including long-term loans and credit lines. They usually offer both secured and unsecured funding, though the UCC data only captures the secured part of their lending. We, therefore, consider our results to be a lower bound for the rise in FinTech lending. The main three (non-MCA) FinTech lenders in our data are CAN Capital, LEAF Capital Funding, and

[6]For example, WebBank is a popular funding bank among FinTech lenders. WebBank is registered in Utah, where banks face no restriction on the maximum loan interest rate. Under federal regulation, this allows WebBank to offer loans at high-interest rates across all US states, even if state-level regulation restricts high-interest loans for local lenders.

[7]See, for example, https://www.wsj.com/articles/with-alternative-lenders-flexibility-and-speed-come-at-a-cost-1408912050 and https://www.wsj.com/articles/small-businesses-rush-to-borrow-online-sparking-fears-of-high-rates-costly-terms-11577734013.

Funding Circle.

III Small business lending data

An important contribution of our paper is the construction of a new dataset covering loan-level information on US business lending. Previous research has focused almost exclusively on syndicated loans provided to large firms or small business lending data reported under the Community Reinvestment Act ("CRA data"). As discussed in more detail below, the existing data does not cover small business loans made by nonbank lenders (e.g., finance companies, FinTech lenders), which provide the majority of secured, non-real estate loans in the US. To the best of our knowledge, our paper is the first to put together a comprehensive loan-level dataset on US small business loans covering both banks and nonbanks.

III.A UCC data

Our data are collected from public records on secured, non-real estate business loans. The records are filed under Article 9 of the Uniform Commercial Code (UCC). UCC is a set of laws governing commercial transactions, and Article 9 specifies creditor rights for business lending. Creditors have the right to file a record with the UCC registry specifying a loan and the underlying collateral, which is referred to as a "UCC filing." A UCC filing records the security interest in the underlying asset, analogous to mortgages for real estate, and determines the priority order of creditors in bankruptcy. If the borrower pledges a piece of collateral to multiple lenders, the lender with the earliest filing date has priority over other lenders.

While laws governing UCC transactions are uniform across the nation, each state has an independent registry to record UCC filings. A lender is required to make the filing in the state in which a business is incorporated (registered corporations) or headquartered (unincorporated organizations).[8] Lenders have a strong incentive to make UCC filings, and most lenders routinely do so. Without the UCC filing, lenders are considered unsecured

[8]Before 2001, lenders were required to make filings in each state where the borrower had tangible property.

creditors, who typically have much lower recovery rates in the case of borrower default. The cost of filing is relatively low: all states accept electronic filings, and the filing fees are small—in the range of $15–$25 in most states. Each state provides public notice of UCC filings to other lenders and has a registry that can be searched by borrower name.

State-level UCC filings cover all collateral, excluding property with titles such as real estate. Real estate transactions are recorded separately because loans secured by real estate property need to be linked to local deeds data, which are usually recorded in local, county-level registries. However, if a firm pledges real estate in combination with other types of collateral against a loan, it is often included in our data because lenders often include real estate as one type of collateral in UCC filings.

The UCC data includes both loans and leases. Lessors make UCC filings for capital leases (also called financing leases) because legal ownership of the asset is transferred to the buyer and lessors want to ensure that they have priority in bankruptcy, as with a regular secured loan. Lessors also routinely make UCC filings for operating leases (or, true leases) even though the lessor retains legal ownership of the asset. Making a UCC filing ensures priority to the lessor even if a court recharacterizes an operating lease as a capital lease in bankruptcy. These filings are commonly referred to as precautionary UCC filings.[9]

Figure A1 in the Appendix provides an example of a typical UCC filing. The filing specifies that First Choice Landscaping ("borrower") received a loan from Wells Fargo Vendor Financial Services ("lender"). The filing lists the addresses of both the borrower and the lender. The filing includes a detailed description of the underlying collateral. The collateral, in this case, is construction equipment produced by Bobcat. The filing includes the serial number of the equipment to ensure proper identification.

We received our data from a commercial vendor that covers UCC filings across all 50 US states and D.C. for the years 2006 to 2016. The vendor collects UCC filing information on the borrower's name and address, the lender's name and address, and information on when the filing was made. The vendor further classifies collateral into 34 broad categories. If there is more than one type of collateral pledged, the vendor lists all types. The vendor adds the DUNS number, which is a widely used business identifier created by Dun & Bradstreet

[9] Eisfeldt and Rampini (2009) examine the tradeoff between borrowing via a secured loan and leasing.

(D&B). The vendor also attaches industry information (SIC code), location information (FIPS county identifier), and firm characteristics (as of 2016) collected from other datasets. We use the DUNS number to link borrowers across filings and over time.[10] We restrict our sample to non-financial, non-utility firms and drop loans originated by government entities. The final dataset covers 11.1 million loans made to 3.3 million unique firms during the years 2006 to 2016. Details on data cleaning are provided in Section I.2.1 of the Internet Appendix.

We note that the UCC does not include loan size. As discussed below, we can estimate loan size for equipment lending using EDA data (EDA data is described in Section III.C), which covers a third of the small business lending market. We, therefore, use the extensive margin of lending (i.e., number of loans and whether a loan was granted) when analyzing total small business lending. Though not perfect, this approach is sensible assuming that loan volume is highly correlated with loan count. We show in Section I.2.5 of the Internet Appendix that there is strong empirical support for this assumption using both CRA data and EDA data. As shown in Internet Appendix Figures I.4 and I.5, the correlation between the volume of lending and the loan count at the county-year level is high: 90% for CRA data and 97% for EDA data.

We are only aware of three other papers that have used data on UCC filings. These papers cover only a subset of our data. Edgerton (2012) uses filings from one state (California) over five years to examine the effect of financial distress of three lenders (Citibank, CIT, and SunBridge) on equipment financing. Murfin and Pratt (2019) use data on equipment financing sourced from UCC filings ("EDA data") to study optimal pricing by captive finance companies. Ma, Murfin, and Pratt (2020) use the same EDA data to study the allocation of capital across young and old firms. To the best of our knowledge, our paper is the first one to use UCC filings for a comprehensive study of US small business lending. We conduct extensive analyses to verify the accuracy and validity of our data as detailed in Section I.2.1 of the Internet Appendix.

[10] Almost all (over 32 million) businesses in the US have a DUNS number. We drop businesses without a DUNS number.

III.B External validity of UCC data

We assess the external validity of the UCC by estimating its coverage of total small business lending. We use publicly available (non-UCC) data sources on small business lending to ensure that our estimate of UCC data coverage can be verified externally and compared to other datasets. This section provides an overview of our approach and the result. Sections I.2.2 and I.2.3 of the Internet Appendix provide additional details on the analysis.

Secured, non-real estate lending. The UCC data covers all secured, non-real estate lending. The main lenders are commercial banks, finance companies, and FinTech lenders. We estimate small business lending by lender type from aggregate non-UCC sources. Using bank-level data from US call report data, we find that total small business loans held by commercial banks are $298.3bn in 2016. Using aggregate Federal Reserve data, we estimate that business loans outstanding at finance companies are $388bn in 2016. Using data from trade publications, we estimate FinTech loans to be about $12.8bn in 2016. As discussed in the Internet Appendix, we verify with UCC data that more than 96% of bank loans, 93% of finance company loans, and 99% of FinTech loans are made to small businesses. Overall, we estimate that the UCC data covers $699.1bn of total small business lending in 2016.

Unsecured lending. Unsecured lending is not covered by UCC data. Luck and Santos (2019) use confidential bank-level regulatory data to estimate the share of unsecured lending. They find that only 3.6% of small business lending is unsecured. We cross-check this estimate by examining credit card borrowing, which is considered the main source of unsecured lending to small businesses. A report by the Federal Reserve Board (2010) estimates that aggregate credit card borrowing is 1.4% of total small business borrowing. We arrive at a similar estimate based on multiplying the average outstanding credit balances with the total number of business credit cards in circulation reported in Agarwal, Chomsisengphet, Mahoney, and Stroebel (2014). To be conservative, we add the Luck and Santos (2019) estimate and the credit card borrowing estimate. We, therefore, estimate that 5% of small business lending is unsecured.

Real-estate lending. Real-estate lending is only partially covered by the UCC data. As discussed above, the reason is that mortgages are recorded in local deeds registries. Luck and Santos (2019) estimate the share of small business lending secured by real estate to be 22%. A survey by the National Federation of Independent Business (2019) arrives at a similar estimate, suggesting that 13% to 22% of firms borrowed against real estate in the years 2008 to 2011. Consistent with these estimates, the 2020 Federal Reserve Small Business Credit Survey finds that 81% of firms do not own their business headquarters, thereby suggesting that at most 19% of firms can borrow against real estate. Hence, we conservatively estimate that real-estate lending is at most 22% of total small business lending.

UCC data coverage. The UCC covers all small business lending except for unsecured lending (estimated to be 5% of total lending) and real-estate lending (estimated to be 22% of lending). It follows that the UCC data covers an estimated 73% of total small business lending. We estimate of the total small business lending market in 2016 is \$699.1bn/0.73=\$957.7bn. We note that our estimate of the market size is almost identical to a recent estimate by the Small Business Administration (SBA). The SBA estimates that total small business lending was about \$1 trillion in 2013, with a total credit of \$422bn provided by finance companies.[11]

Comparison to other data sources. We provide a detailed comparison of the UCC data with other datasets on business lending in Section I.2.3 of the Internet Appendix. We find that the most widely used dataset, the CRA data, covers 43% of small business lending. The data coverage is significantly lower than the UCC data because CRA does not cover nonbank lenders and lending by small banks and credit unions. We find that the SBA loan-level data, another commonly used dataset on small business lending, covers 8% of the small business lending data. The reason for this low coverage rate is that the SBA data only covers government-guaranteed loans. We conclude that UCC data has high external validity when compared with commonly used datasets on small business lending.

[11] https://www.sba.gov/sites/default/files/2014_Finance_FAQ.pdf

III.C Non-UCC data.

Bank-level data. We link the UCC filings to bank-level data from Call Reports. We follow the procedure outlined in Drechsler, Savov, and Schnabl (2021a) to construct bank-level variables. We manually assign matches for the 20 largest banks covering 40% of total bank lending. For the remainder of the sample, we match the UCC filings to call reports using a fuzzy match based on lender names by location. We manually check the fuzzy name-match for all banks with at least 100 loans to ensure our algorithm is mapping to the right lender and correct for mismatches. We achieve a high match rate and link 90.4% of loans made by banks to their respective call reports. We combine banks into a single bank if the banks merged during the sample period.[12]

Location data. The data vendor maps the exact address of the borrower to its county, which we use for our analysis. Our results are similar if we instead map the ZIP code available in the UCC filings to counties using the US Department of Housing and Urban Development's ZIP Code Crosswalk Files based on 2010 Census geographies.[13]

EDA data. Our main sample does not include information on loan volume. We, therefore, supplement the UCC data with information on equipment lending from Equipment Data Associates (EDA). EDA sources its data from UCC filings and appends it with information on the value of the pledged equipment. The data is restricted to equipment financing equipment, where the collateral usually has a unique identifier (e.g., tractors, excavators, crawlers). This covers around a third of all UCC filings. This dataset tracks the financing of new and used equipment along with the exact serial number, model, year of make, and manufacturer of the equipment. EDA provides estimates of loan size based on the value of the collateral. We use the data to impute lending volumes and compute average loan size.

County and industry level real outcomes. We collect information on county and county-industry-level employment, establishment count, and payroll from the Census Bureau's

[12]We combine loans in this way to be consistent with the results in Chen, Hanson, and Stein (2017). This adjustment affects the Top4 bank share because the Top4 banks acquired several banks during the 2008 financial crisis. Under this procedure, Top4 banks are assigned loans by the Top4 banks and loans originated by banks that were eventually acquired by the Top4 banks. Our main results are unaffected by this classification because we primarily focus on the distinction between lending by banks versus nonbanks.

[13]For ZIP codes that are a part of multiple counties, we value-weight the loan in proportion to the population of the ZIP code in the county.

County Business Patterns (CBP) database. Wages are calculated as a share of payroll per employee. Industry is at the two-digit NAICS level. We obtain data on the county-level establishment expansion rate from the Census Bureau's Statistics on US Businesses (SUSB) database. The expansion rate is calculated as the fraction of total businesses that expanded employment in a given year. We gather information on local unemployment and labor force participation rates from the Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS). We use the annual average of the monthly surveys provided in the county tables. We collect data on the annual population level from the US county population database produced by the US Census Bureau's Population Estimates Program in collaboration with the National Center for Health Statistics.

IV UCC data summary statistics

The UCC data provides a novel perspective on US small business lending. It is the first broadly representative US dataset that includes loans by nonbanks. It is also the first dataset to contain comprehensive information on loans, firms, and collateral pledged to lenders. This section provides a detailed overview of loan, firm, and collateral characteristics in the small business lending market.

Panel A of Table 2 provides summary statistics on lenders. We find that banks and nonbank lenders made a total of 4.9 million loans and 6.3 million loans from 2006 to 2016, respectively. The data covers 3,756 banks and 3,836 nonbanks with at least 100 loans during the sample period, making on average 1,248 loans and 1,405 loans, respectively. Among lenders with at least 1,500 loans, the data covers 347 banks and 409 nonbank lenders, making on average 10,055 and 10,406 loans, respectively.

Panel B provides summary statistics on bank and nonbank lenders by lender type. We restrict the lender count to lenders that make at least 1,500 loans. The four largest banks (J.P. Morgan Chase, Bank of America, Wells Fargo, and Citibank) made around 750,000 loans, small banks above the under CRA reporting threshold (237 lenders) made 2.8 million loans, and banks below the CRA reporting threshold along with credit unions (106 lenders) made around 1.4 million loans. Among nonbanks, finance companies are by far the largest

lenders. We distinguish between independent finance companies (187 lenders) and captive finance companies (91 lenders). Independent and captive finance companies made 1.4 million loans and 2.3 million loans from 2006 to 2016, respectively. The other main lender types are FinTech lenders (20 lenders), cooperatives (30 lenders), and investment companies such as insurance companies, hedge funds, and private equity firms (29 lenders), each making less than 300,000 loans from 2006 to 2016.[14] The remaining loans are made by other nonbank lenders, most of which are non-financial firms providing trade credit to suppliers or customers.

Panel C provides summary statistics on the growth by lender type. Total bank lending grew by 5.6% from 2006 to 2016, while total nonbank lending grew by 40.9%. Within banks, we find that the slow growth in bank lending is driven by the four largest banks, which reduced lending by 7.8% from 79,236 loans in 2006 to 73,084 loans in 2016. Smaller banks partly made up for the loss by increasing lending. Of these, small banks that are within the CRA reporting threshold increased lending by 7.3% from 262,002 loans in 2006 to 281,030 loans in 2016. The smallest banks (asset size below CRA coverage) and credit unions grew by 10.4% in the same period, increasing from 125,125 loans in 2006 to 138,193 loans in 2016.

The growth in nonbank lending was driven primarily by independent finance companies and FinTech lenders. Independent finance companies increased annual lending by 63%, from 112,580 loans in 2006 to 182,927 loans in 2016. FinTech lenders—effectively nonexistent at the start of the sample period—provided 2,314 loans in 2006 and 78,142 loans in 2016. Agricultural lending by cooperatives grew over the sample period but remained small at 30,686 loans in 2016. Lending by other nonbanks and non-financial firms grew from 150,908 loans in 2006 to 210,933 loans in 2016, consistent with substitution towards smaller lenders. Lending by investment companies remained flat, and lending by captive finance companies slightly decreased.[15]

Panel D provides information on borrower characteristics by lender type. We find that banks and nonbanks are both broadly diversified across industries. The market shares are

[14] As discussed above, we cannot separately identify different MCA lenders, which means that the FinTech lender count is a lower bound

[15] We find a large variation in nonbank lender growth across individual lenders. The growth was a mix of growth by lenders that were already large in 2006 and some new lenders that emerged after 2006. Many smaller nonbank lenders did not grow or even reduced lending during this period. A fruitful area of future research lies in identifying the determinants of what allows some lenders to grow while others falter.

similar across banks and nonbanks for construction, manufacturing, retail trade, transportation, and wholesale trade. Banks lend less to agricultural firms than nonbanks (10.5% vs. 18.7%) and more to service firms (39.0% vs. 31.3%). The overlap in industry composition is highest among banks and independent finance companies, consistent with substitution from banks to independent finance companies. Captive finance companies, which experienced a decline in lending, have a larger concentration in equipment-heavy sectors, such as agriculture (28.2%) and construction (14.1%), than banks. FinTech lenders are concentrated in retail trade (23.0%) and services (40.1%), than banks. FinTech lenders are more concentrated in retail trade (24.3%) and services (42.4%). This may reflect their reliance on online repayment, often requiring a fixed percentage of retail sales revenues.

Panel E shows that borrower size measured is similar across banks and nonbanks. As mentioned above, we restrict the firm size analysis to the year 2016 because we only observe firm-level data covering the most recent loan observation. Bank borrowers have on average 40 employees while nonbank borrowers have 43 employees. The median number of employees is six for both banks and nonbank borrowers. Average sales of bank and nonbank borrowers are $8.6 million and $9.1 million, and median sales are $354,000 and $250,000, respectively. Independent finance companies mirror banks with average employees of 41 and average sales of $8.4 million, consistent with substitution from banks to independent finance companies. FinTech lenders tend to lend to smaller firms with an average of 18 employees and average sales of $3.0 million.

Panel F provides statistics on the number of loans per firm, average loan size, and loan maturity. Firms take out on average 2.4 loans with banks and 2.95 loans with nonbanks. The median number of loans per firm is two: one with a bank and one with a nonbank. As discussed above, loan size is estimated from equipment data and covers a third of the small business lending market. Maturity is computed from UCC filings that were terminated before the five-year expiration period. The average loan size for banks and nonbank lenders is $122,402 and $132,902, and the average maturity is 36 months and 28 months, respectively. Captive and independent finance companies have an average loan size of $128,481 and $148,242 and an average maturity of 32 months and 23 months, respectively. FinTech lenders make smaller and shorter loans, with an average loan size of $93,596 and an average

maturity of 19 months.

Panel G examines collateral by lender type. We note that many borrowers pledge more than one piece of collateral. We find that both banks and nonbanks lend heavily against equipment, which is pledged against 65% (67%) of bank (nonbank) loans. Equipment covers a broad range of movable collateral including machinery, computer equipment, heavy tools, transportation vehicles, trucks, and appliances. Banks are more likely to require additional collateral, such as deposit accounts (41% vs. 24%), general intangibles (39% vs. 23%), chattel paper (30% vs. 21%), inventory (32% vs. 16%), and fixtures (25% vs. 13%) than nonbanks. This suggests that nonbanks are more focused on the sales value of a specific piece of collateral, consistent with asset-based lending, while banks may lend more against a broad set of collateral, consistent with cash flow based lending.

We also examine whether there was convergence in collateral during the sample period. If nonbanks substitute for banks, we expect to see that nonbanks started to mirror banks and required more additional collateral. Indeed, we find that nonbanks expanded their collateral towards assets that were typically pledged to banks. As shown in Figure 3, in 2006 only 12% of nonbank loans had deposits as collateral compared to 28% in 2016. Similarly, the use of general intangibles as collateral for nonbank loans increased from 11% in 2006 to 28% in 2016. We find a similar pattern for other collateral such as chattel paper, inventory, and fixtures, suggesting that nonbank lending is increasingly serving as a substitute for bank lending.

Taken together, we show that banks and nonbanks look remarkably similar in terms of their lending. Independent finance companies appear to be most similar to banks in that they serve similar borrowers in terms of industry, collateral, firm size, and loan characteristics. We also find convergence between banks and nonbanks in terms of loan collateral. These findings may explain why nonbank lenders were able to substitute for banks as business lenders after the 2008 financial crisis.

V Results

V.A Empirical strategy

We document the rise of nonbank lending after the 2008 financial crisis in Figure 1. In this section, we ask what caused the rise in nonbank lending. Broadly speaking, the rise of nonbank lending may be due to a negative shock to the supply of bank lending or increased demand for nonbank lending. Under the supply-side explanation, banks reduced the supply of lending and, in response, nonbanks substituted for banks by expanding their credit supply. Under the demand-side explanation, borrowers had a higher demand for (specialized) loans offered by nonbanks relative to loans offered by banks.

We turn to the cross-section to examine whether the rise of nonbank lenders was due, on net, to a negative supply shock or a demand shock. We start from the observation that the decline in bank lending after the 2008 financial crisis was caused by a negative shock to the banking sector. The negative shock was the result of several factors such as tighter regulation of banks, the introduction of bank stress tests for large banks, banks' reassessment of the validity of their internal risk models, and losses incurred during the 2008 financial crisis. Consistent with a negative supply shock, the decline in bank lending coincided with a large increase in the average loan spread.[16]

For the purpose of our cross-sectional empirical strategy, the key insight is that this shock was nationwide but played out differently across different regions. Regions that relied more on bank lending *before* the financial crisis were more affected by the reduction in bank lending than regions that relied less on bank lending. We, therefore, expect to see a larger increase in nonbank lending in regions where banks had a higher initial market share. The identification assumption is that the bank market share before the financial crisis had no other effect on the demand for nonbank lending.[17]

[16]The Federal Reserve collects data on interest rates for small business loans. We discuss the evolution of interest rates in Section I.2.6 of the Internet Appendix. As shown in Internet Appendix Figure I.6, the loan spread on small business loans peaked at the same time as total lending slumped. The fact that loan spread (price) and lending (quantity) moved in opposite directions indicates that the bank lending experienced a negative supply shock.

[17]We follow a long literature of identifying credit supply shocks by analyzing substitution in market share across loan types. The logic behind this approach goes back to (at least) Kashyap, Stein, and Wilcox (1993) who analyze the substitution between bank lending and commercial paper borrowing during monetary policy

A simple numerical example helps illustrate the logic behind our identification strategy. Suppose bank lending declines by 50% across all counties and nonbank lending remains the same everywhere. Assume that region A has an initial bank market share of 90% and region B has an initial bank market share of 10%. Now consider the reduction in bank lending. Region A experiences a reduction in bank lending of $0.9 \times 0.5 = 45\%$. Region B experiences a reduction in bank lending of $0.1 \times 0.5 = 5\%$. Hence, even if banks pull back uniformly across regions, the impact of the shock is larger in regions with a higher initial bank market share.

Arguably, the main concern with our identification strategy is that the demand for nonbank lending increased in areas with a high initial market share because of an increase in specialized loan demand. To address this concern, we control for loan demand in several ways. First, we add highly disaggregated industry and collateral fixed effects to our regressions to control for the industry- and collateral-specific loan demand. Second, we focus on the subset of firms that took out loans with both banks and nonbanks before the 2008 financial crisis and examine whether there is substitution from banks to nonbanks ("within-firm estimator"). Third, we identify shocks to the supply of bank lending based on three separate natural experiments and estimate the substitution from banks to nonbanks. Fourth, we compare lending by bank-owned finance companies with nonbank-owned finance companies, thereby narrowly focusing on firms that borrow from finance companies.

V.B Results on lending

V.B.1 Summary statistics on bank market share

We start by examining the distribution of the market share of banks before the 2008 financial crisis ("bank share"). Panel A of Figure 2 shows a map of the bank share. We compute the bank share as the county-level market share of bank lending in the year 2006. We find significant variation in the bank share across the US with some clustering on the West Coast and in the Midwest. As discussed below, our preferred empirical specification controls for state-level fixed effects to address any clustering due to state-level bank regulation or other

contractions during the 1970s and 1980s.

state-level variables affecting bank lending.

Table 3 presents county-level summary statistics. The average bank share is 47.3% with a standard deviation of 13.2%. We find that in 2005 counties below and above the median bank share are comparable, with an unemployment rate of 5.4% vs. 5.5%, a labor force participation rate of 49.5% vs. 48.6%, an average wage of $27,596 vs. $27,705, and a total population of 93,127 vs. 98,583. They also have similar pre-trends from 2002 to 2006 with labor force participation growth of 2.7 pp vs. 3.5 pp, unemployment rate growth of −0.83 pp vs. −0.80 pp, establishment growth of 2.5% vs. 2.8%, and wage growth of 13.9% in both groups. These summary statistics show that counties with high and low bank shares are fairly similar at the start of our analysis period.

Panel B of Figure 2 provides a map of the increase in the nonbank market share from 2007 to 2016. Consistent with our empirical strategy, we find that nonbank lending grew significantly more in areas with a high bank share. As shown in Table 3, counties below and above the median bank share have nonbank lending growth of 21.2% vs. 38.9% and an increase in nonbank market share of 3.7 pp vs. 8.8 pp. We find almost no differences in terms of real outcome variables such as employment growth, establishment growth, average wages, and the business expansion rate from 2007 to 2016. These results suggest that borrowers substituted from banks to nonbanks without a significant effect on real economic activity.

V.B.2 Bank market share and lending

Our empirical strategy is based on the observation that there was a negative shock to the supply of bank lending after 2008. As discussed above, the intuition is that the shock was nationwide and affected all counties. It follows that the decline in bank lending after 2008 should be the same across counties, but the impact across counties differs because of variation in the initial bank share. This yields the empirical prediction that the decline in bank lending is uncorrelated with the bank share before the 2008 financial crisis.

Panel A of Figure 4 shows a binned scatter plot of the decline in bank lending versus the bank share. The bank share is computed as of 2006, and the bank lending decline is computed as the relative change in bank lending from 2007 to 2010. Consistent with our empirical strategy, we find no discernible relationship between the two variables, with a low

correlation of 5.3%. Panel B depicts a similar result when computing bank lending based on CRA data with a correlation of −0.73%. Panel C plots the same relationship as in Panel A but computes bank lending growth as a share of total lending, i.e., bank lending growth from Panel A is multiplied by the initial bank share. As expected, we find that the bank lending decline is negatively correlated with the initial bank share with a correlation of −46.1%. This supports our assumption that the supply shock is nationwide but affects counties differently because of variation in the bank share. We, therefore, use the bank share as a supply-shifter for lending in the aftermath of the 2008 financial crisis.[18]

Next, we examine whether there is a substitution from bank lending to nonbank lending. We expect a larger substitution in counties with a higher bank share. Panel A of Figure 5 presents a binned scatter plot of the growth in the market share of nonbank lending from 2007 to 2016 against the bank share in 2006. We control for state fixed effects to address state-level differences in bank regulation. We find significantly larger nonbank growth in counties with a higher bank share. The average market share of nonbanks grew by 11.2 pp for counties in the top decile of bank share, while it grew by only 0.2 pp for counties in the lowest decile. The relationship is approximately linear, consistent with a constant effect of bank share on nonbank lending. Panel B presents the corresponding binned scatter plot of the growth in nonbank lending from 2007 to 2016 against the bank share in 2006. We find the same relationship: counties in the top decile of bank share experienced average nonbank lending growth of 47.8% relative to 9.9% in the bottom decile.

Panel C presents the effect on total lending by showing a binned scatter plot of the growth in total lending from 2007 to 2016 against the bank share in 2006. We find that the relationship between total lending growth and bank share is flat. This shows that the increase in nonbank lending almost perfectly offsets the decline in bank lending.

We verify these results by estimating the following ordinary least squares (OLS) regression:

$$\Delta Y_c = \alpha_s + \gamma BankShare_{06,c} + \delta X_c + \varepsilon_c, \tag{1}$$

[18]The logic behind our identification approach is the same as for a standard Bartik instrument. Hence, we could implement our empirical strategy with a Bartik instrument, constructed by multiplying the bank share with the nationwide change in bank lending. However, we prefer using the bank share directly because we believe this approach is more transparent.

where the outcome variable ΔY_c is either the change in the market share of loans originated by nonbanks in county c from 2007 to 2016, the growth in nonbank loans originated in county c from 2007 to 2016, or the growth in total loans originated in county c from 2007 to 2016. $BankShare_{06,c}$ is the market share of banks in county c in 2006. We include county-level control variables, denoted as X_c, to capture initial economic conditions (unemployment rate, labor force participation rate, average wage, and natural logarithm of population in 2005) and pre-trends (employment growth, wage growth, and business establishment growth between 2002 and 2006). We denote state-level fixed effects as α_s. Standard errors are clustered at the county level.

Panel A of Table 4 presents our preferred specification with the full set of controls. We find a coefficient of 0.218 with nonbank market share as the outcome variable (Column 1) and 0.553 with nonbank lending growth as the outcome variable (Column 2). Both coefficients are statistically significant at the 1%-level. The coefficients show that moving from the 10th percentile (bank share of 30.4%) to the 90th percentile (bank share of 63.4%) of the bank share distribution leads to an increase in the nonbank market share of 7.2 pp and an increase in nonbank lending of 18.3%. The coefficient on total lending is close to zero at 0.026 (Column 3). This shows that the growth in nonbank lending completely offsets the decline in lending by banks.[19] Panel B shows that our results are effectively unchanged if we estimate the regressions without controlling for state fixed effects, suggesting that they are robust to using variation both within and across states.

V.B.3 Controlling for industry and collateral specialization

A possible concern is that our results represent the demand for specialized loans by firms operating in certain industries. We control for industry-specific loan demand by only comparing firms operating within the same narrow industry. We compute bank, nonbank, and total lending growth at the county-industry level for two-digit SIC industries (66 industries).

[19] Our results do not necessarily rule out complementarity between bank and nonbank lending. Nonbanks may complement lending by banks in the sense that nonbanks reach out to borrowers that were not served by banks. If nonbanks reach out to new borrowers and substitute for reduced bank lending, we would expect that total lending increases (which we do not see). However, it is possible that nonbanks reach out to new borrowers and that some bank borrowers are not served by nonbanks. This would be consistent with our results.

We require that both banks and nonbanks lend within a county-industry observation at the beginning and end of our sample to minimize the effect of outliers. Internet Appendix Table I.1 reports summary statistics at the county-industry level.

Panel A of Figure 6 presents a binned scatter plot of the growth in nonbank market share at the county-industry level from 2007 to 2016. The figure controls for industry fixed effects. The relationship is positive: the average nonbank market share grew by 5.4 pp in counties in the top decile while it remained constant in counties in the lowest decile of bank share. Panel B finds the same relationship for nonbank lending growth. Panel C shows that total lending did not change with bank share, i.e., bank lending and nonbank lending offset each other even after controlling for industry.

We verify these results using the following OLS regression:

$$\Delta Y_{j,c} \quad = \quad \alpha_s + \eta_j + BankShare_{06,c} + \delta X_c + \varepsilon_c, \tag{2}$$

where $\Delta Y_{j,c}$ is either the change in the market share of nonbanks in industry j and county c from 2007 to 2016, the growth in the nonbank loans to firms operating in industry j in county c from 2007 to 2016, or the growth in total loans to firms in industry j in county c between 2007 and 2016. $BankShare_{06,c}$ is the bank share of county c in 2006. X_c are the same county-level control variables as in Table 4. We denote state-fixed effects as α_s and industry fixed effects as η_j. We cluster standard errors at the county and industry levels.

Panel A of Table 5 presents the results. We find a positive and statistically significant coefficient for the outcome variables nonbank share and nonbank lending growth and a zero coefficient for the outcome variable total lending growth. Moving from the 10th percentile to the 90th percentile of the bank share distribution leads to an increase in the nonbank market share of 3.8 pp and an increase in nonbank lending of 8.2%. There is no effect on total lending.

Similar to controlling for industry specialization, we can also control for specialized loan demand tied to specific types of collateral. We compute lending at the county-collateral level by assigning loans to a single type of collateral based on the 34 categories of collateral available in our data. Loans with multiple types of collateral are assigned to the most common

collateral type based on the relative frequency of the collateral in our data.[20] We require that both banks and nonbanks lend to the same county-collateral group at the beginning and the end of our sample. Internet Appendix Table I.1 reports summary statistics at the county-collateral level.

Panel A of Figure 7 presents a binned scatter plot of the growth in nonbank market share from 2007 to 2016 versus the bank share. We control for collateral fixed effects. We find that the average nonbank market share grew by 9.1 pp in counties in the top decile while it remained constant in counties in the lowest decile of bank share. Panel B finds the same relationship for nonbank lending. Panel C shows that nonbank growth was slightly larger than the decline in bank lending.

We verify the results by running the same OLS regression as in equation (2) at the county-collateral level. We replace industry fixed effects with collateral fixed effects and cluster at the county and collateral level. Panel B of Table 5 shows that we find similar results as when we control for industry specialization. Moving from the 10th percentile to the 90th percentile of the bank share distribution leads to an increase in the nonbank market share of 7.0 pp and an increase in nonbank lending of 16.4%. There is no effect on total lending.

V.B.4 Within-firm estimator

The analysis so far controls for specialized loan demand by comparing firms within the same industry and borrowing the same type of collateral. An alternative approach is to control for loan demand by comparing lending by banks and nonbanks to the *same* firm. We restrict this analysis to firms that took out at least one loan with a bank and at least one with a nonbank in the years 2006 or 2007. This yields 146,130 firms. We examine whether a firm received a new loan ("repeat loan") from a bank or nonbank after 2008. The unit of observation is at the firm-lender-type level, i.e., we have two observations per firm. We estimate the following OLS regression:

$$RepeatLoan_{i,b} = \alpha_i + \beta Nonbank_b + \varepsilon_c, \quad (3)$$

[20] Our regression results are robust to using combinations of the different types of collateral jointly pledged, counting the loan towards every collateral category, or assigning the loan to the least common type of collateral.

where $RepeatLoan_{i,b}$ is an indicator variable equal to 1 if firm i received a repeat loan from lender type b and zero otherwise, $Nonbank_b$ is an indicator variable equal to 1 if the lender type is a nonbank and zero otherwise, and α_i are firm fixed effects. We cluster standard errors at the firm and county level.

Panel A of Table 6 presents the results. Column 1 shows that borrowers are 3.4 pp more likely to receive a repeat loan from a nonbank than bank borrowers. Column 2 presents the same specification weighted by firm size (number of loans in pre-period). The coefficient is effectively unchanged, which shows that the result does not depend on firm size. Column 3 shows that the coefficient increases to 4.3 pp when controlling for industry and county fixed effects instead of firm fixed effects.[21] Column 4 reports a coefficient of 4.9 pp when controlling for county fixed effects only. These results confirm that there is substitution from banks to nonbanks even when analyzing the *same* firm.

To further examine variation across firms, we also analyze the sample of firms that had taken out at least one loan with either a bank or a nonbank in 2006 or 2007, but not both. Our sample consists of 821,046 firms. We estimate the following OLS regression:

$$RepeatLoan_i = \alpha + \beta Nonbank_i + \delta X_i + \varepsilon_c, \quad (4)$$

where $RepeatLoan_i$ is an indicator variable equal to 1 if the firm i receives a repeat loan and zero otherwise, $Nonbank_i$ is an indicator variable equal to 1 if the lender is a bank and zero otherwise, X_i are firm-level control variables, and α is a constant. We cluster standard errors at the industry and county levels.

Panel B of Table 6 presents the results. Column 1 shows that nonbank borrowers are 2.9 pp more likely to receive a repeat loan than bank borrowers *after* controlling for county and industry fixed effects. Column 2 weights by firm size and finds that the coefficient increases to 5.3 pp, suggesting that the effect is larger for large firms. The coefficient further increases to 9.1 pp when controlling for county fixed effects (Column 3). The coefficient remains stable at 9.6 pp without controlling for fixed effects (Column 4). These results provide further support for the substitution from banks to nonbanks.

[21] We do not include firm fixed effects and county or industry fixed effects in the same specification because they are collinear.

V.B.5 Natural experiments.

While our baseline specification relies on geographic variation in pre-crisis bank dependence of the region, a potential concern is that bank shares may be correlated with other county characteristics such as growth or post-crisis nonbank demand. To address this, we study the substitution from banks to nonbanks using natural experiments. The academic literature has proposed several natural experiments for quasi-exogenous changes in bank lending after the 2008 financial crisis. We identify three papers with different natural experiments that can be applied in our setting (Tang (2019), Cortés, Demyanyk, Li, Loutskina, and Strahan (2020), Buchak, Matvos, Piskorski, and Seru (2018)).

Identification based on off-balance sheet vehicles. Tang (2019) uses bank exposure to off-balance sheet vehicles based on Dou, Ryan, and Xie (2018) and Dou, Ryan, and Xie (2018). The logic behind this approach is that the post-crisis implementation of the accounting rule FAS 166/167 required banks to consolidate off-balance sheet vehicles, which had been used for regulatory arbitrage (Acharya, Schnabl, and Suarez (2013)). The consolidation of the vehicles on bank balance sheets lowered banks' regulatory capital and reduced bank lending.

We collect the data on FAS 166/167 exposure from bank call reports. We classify banks as exposed if they report a positive value for assets of consolidated variable interest entities (VIEs) in 2011Q1, calculated using the replication package in Dou, Ryan, and Xie (2018). We compute county-level exposure as the 2007 market share of banks that were eventually exposed to FAS166/167 rules ("FAS share").

We replicate our preferred specification from Table 4 after replacing the bank market share with FAS share. Consistent with our main results, Panel A of Table 7 shows that a negative bank supply shock (as measured by FAS share) increases nonbank lending but not total lending. Specifically, moving from the 10th percentile (0.97%) to the 90th percentile (20%) of county-level FAS share increases the nonbank market share by 5.8 pp (Column 1) and nonbank lending growth by 11.3% (Column 2). Column 3 shows that the net effect on total lending is zero, i.e., the increase in nonbank lending almost exactly offsets the negative bank supply shock.

Identification based on bank stress tests. Cortés, Demyanyk, Li, Loutskina, and Strahan (2020) use exposure to bank stress tests as a negative shock to bank lending. The idea is that banks subject to stress tests faced tighter capital constraints and therefore reduced lending. We identify stress-tested banks from the Federal Reserve Board's release of bank stress test results. We construct county-level exposure to stress-tested banks as the 2007 market share of banks eventually subject to stress test ("stress-test share").

We replicate our preferred specification from Table 4 after replacing the bank share with the stress-test share. As shown in Panel B of Table 7, we find that exposure to banks stress tests raises nonbank lending but not total lending. Moving from the 10th percentile (2.3%) to the 90th percentile (24.2%) of county-level stress-test share increases the nonbank market share by 5.8 pp (Column 1) and nonbank lending growth by 10.8% (Column 2). Nonbank lending growth offsets the decline in bank lending (Column 3).

Identification based on bank leverage. Buchak, Matvos, Piskorski, and Seru (2018) use the required increase in bank capital due to the Dodd-Frank Act of 2010 as a negative shock to the supply of bank lending. The idea is that banks need to trade off the required increase in capital with providing new loans. We construct county-level exposure to bank capital increases following the strategy in Buchak, Matvos, Piskorski, and Seru (2018) ("capital raise").

We estimate our preferred specification from Table 4 after replacing the bank market share with the capital raise. As shown in Panel C of Table 7, we find that a higher capital raise increases nonbank lending but does not affect total lending. Moving from the 10th percentile (0.14 pp) to the 90th percentile (1.63 pp) increases the nonbank market share 4.0 pp (Column 1) and nonbank lending growth by 9.5% (Column 2). Nonbank lending growth almost perfectly offsets the decline in bank lending (Column 3).

To summarize, three different natural experiments yield similar results to our main identification strategy. All three experiments show that a negative shock to the banking sector increases nonbank lending and that the increase in nonbank lending offsets the decline in bank lending.

V.B.6 Bank-owned finance companies

We test whether the observed change in bank lending is driven by differences in firms served by banks and those served by nonbanks. Paravisini, Rappoport, and Schnabl (2015) argue that banks often specialize in certain types of loans, which may not be controlled for by firm fixed effects or industry and collateral controls.

To address this concern, we compare lending by bank-owned finance companies to lending by independent finance companies. Bank-owned finance companies (e.g., Wells Fargo equipment finance) and independent finance companies generally serve similar firms and lines of business. However, only bank-owned finance companies are subject to bank regulation because they are owned by a bank or a bank holding company.[22] If demand-side differences drive observed lending patterns, we would expect bank-owned finance companies to behave similarly to independent finance companies. If regulation drives the decline in bank lending, bank-owned finance companies are likely to respond in line with banks.

We replicate our preferred specification from Table 4 using the change in the market share of bank-owned finance companies. As shown of Table 8, we find a negative coefficient of 0.030 (Column 1). This shows that bank-owned finance companies were unable to make up for the decline in bank lending. Rather, they reduced lending in areas with a high bank share. In contrast, we find a positive coefficient of 0.049 when using the market share of independent finance companies as the outcome variable (Column 2). This shows that independent finance companies expanded in areas where banks curbed their lending. These results suggest that the decline in bank lending was driven by strict bank regulation rather than a change in credit demand.

V.B.7 Results on the real economy

This section examines the real consequences of the supply shock to bank lending on small businesses. Our results on lending show that growth in nonbank lending almost perfectly offset the decline in bank lending. We, therefore, expect that there are no long-term real

[22]Bank-owned finance companies provide services such as equipment financing, leasing, and vendor financing. We are not the first to examine the role of bank-owned subsidiaries. Demyanyk and Loutskina (2016) analyze whether banks used mortgage subsidiaries to circumvent regulation before the 2008 financial crisis.

effects from the decline in bank lending in the aftermath of the 2008 financial crisis. We test this prediction by examining the impact of bank share on real outcomes.

Specifically, we estimate the following OLS regression:

$$\Delta Y_c = \alpha_s + BankShare_{c,06} + \delta X_c + \varepsilon_c, \quad (5)$$

where ΔY_c is the change in outcome variable Y in county c from 2007 to 2016. We examine four commonly used real outcome variables: the growth rate in the number of establishments, employment growth, wage growth, and the business expansion rate. The expansion rate is the share of businesses that increase employment in a given year. $BankShare_{06,c}$ is the bank share of county c in 2006, X_c are county-level control variables, and α_s are state fixed effects. Standard errors are clustered at the county level.

Panel A of Table 9 presents the results. We find that the bank share has no effect on real outcomes between 2007 and 2016. The effect of bank share on establishment growth (Column 1), employment growth (Column 2), and wage growth (Column 3) is close to zero and statistically insignificant. The effect on the expansion rate is marginally significant but economically small and has the wrong sign. To control for industry effects, we also estimate all our results at the two-digit industry NAICS level. Panel B of Table 9 presents the results. We find that the coefficients are close to zero and statistically insignificant for all outcome variables.

V.C Robustness

This section provides additional tests to distinguish between the credit supply and credit demand explanations.

Crisis versus recovery period. Our analysis focuses on the change in lending from 2007 to 2016. Internet Appendix Figure I.1 replicates Figure 5 after dividing the sample period into a crisis period (2007–2010) and a recovery period (2010–2016). We choose the two periods to match the decline and recovery in total lending in Figure 1. We find that total lending declined more in regions with a high bank share during the crisis period (Panel A, left

Column). In contrast, total lending increased more in regions with a high bank share during the recovery period (Panel A, right Column). Panels B and C show the corresponding scatter plots for nonbank lending growth and the change in nonbank market share, respectively. We find that nonbank lending did not grow with bank share in the crisis period (left Column) but grew strongly with bank share in the recovery period (right Column). These results provide support for our observation that there was a decline in bank lending during the crisis period, which was eventually offset by increased nonbank lending during the recovery period.

Firm-level analysis by year. We examine the dynamics of the crisis on access to credit at the firm level by controlling for firm fixed effects. Specifically, we estimate the following OLS regression:

$$Loan_{it} \quad = \quad \alpha_i + \delta_t + \gamma_t BankShare_{06,c} + \varepsilon_c, \tag{6}$$

where $Loan_{it}$ is an indicator variable equal to 1 if firm i receives a new loan in year t and 0 otherwise, $BankShare_{06,c}$ is the county-level bank share in 2006, α_i are firm fixed effects, and δ_t are year fixed effects. The set of coefficients γ_t capture the effect of bank share on receiving a loan in year t. Standard errors are clustered at the industry and county levels.

Internet Appendix Table I.2 presents the results. We find that firms located in counties with a high pre-crisis bank share were less likely to take out a new loan than firms located in counties with a low pre-crisis bank share after the financial crisis. As shown in Column 1, the negative effect on new loans is largest in 2012, with a coefficient of -0.041, and then gradually disappears. By 2014, the coefficient is -0.01 and remains statistically insignificant thereafter. As shown in Column 3, the negative effect is caused by a decline in new bank loans. This shows that total lending declined in the immediate aftermath of the 2008 financial crisis but eventually recovered because of greater nonbank lending.

Instrumental variable estimation. An alternative way to estimate our main results is to use the pre-crisis market share as an instrument for bank lending. The identification assumption is that the pre-crisis bank share only affects nonbank lending through its impact

on bank lending. As discussed above, this is plausible given that we analyze a nationwide shock to the banking sector. We implement the IV strategy by estimating our main specification in Table I.3 after replacing the market share with the decline in bank lending and instrumenting for the decline in bank lending with the pre-crisis bank share. There is no weak instrument issue given that the F-statistic is 25.5. The first stage is shown in Panel B. Panel A reports the main results. Columns 1 and 2 find that a more negative bank supply shock leads to more nonbank lending, but as shown in Column 3, there is no effect on total lending. Hence, we find similar results as with our main empirical strategy.

Controlling for Top4 share. The literature has documented a drop in lending by large banks after 2008. Chen, Hanson, and Stein (2017) show that the four largest banks (Top4) significantly reduced small business lending in the aftermath of the financial crisis. We control for the Top4 deposit market share to study whether the effect of nonbank growth can be explained solely by the drop in Top4 lending. We compute the Top4 deposit market share following Chen, Hanson, and Stein (2017). We estimate our preferred specification from Table 4 and add Top4 share as a control variable. Internet Appendix Table I.4 presents the results. We find a positive effect of Top4 share on lending growth across all specifications. Importantly, however, the coefficients on bank share are effectively unchanged. Hence, our results are unaffected when controlling for the Top4 share.

Large counties. Our main specification uses equal weights for all counties. To match the aggregate evidence, we can also weight counties by their share of national lending. We estimate our preferred specification from Table 4 with state fixed effects using total lending in 2007 as weights. Panel A of Internet Appendix Table I.5 presents the results. We find that moving from the 10th to 90th percentile of bank share increases nonbank market share by 9.4 pp and leads to a 24.9% increase in lending by nonbanks. These results are similar to the unweighted regressions, where the effects are 7.2 pp and nonbank lending by 18.3%, respectively. The results are similar when the sample is weighted by county population (Panel B) or focusing on just the 100 largest counties in the US (Panel C).

Per-capita results. Our main results are scaled by pre-crisis lending. As robustness, we estimate our results scaled by population. We estimate our preferred specification from Table 4 using as outcome variables bank lending, nonbank lending, and total lending divided by the total population. Internet Appendix Table I.6 present the results. Consistent with our main results, we find that bank share has a negative and statistically significant effect on per-capita bank lending, a positive and statistically significant effect on per-capita nonbank lending, and no effect on per-capital total lending. Hence, our results are robust to estimation in per-capita terms.

Controlling for retail mortgage lending. Small business lending may be correlated with other retail bank lending activity. To isolate the effect of small business lending, we control for the county-level bank share in retail mortgage lending in our preferred specification from Table 4. We compute the retail mortgage bank share following Drechsler, Savov, and Schnabl (2021b). Internet Appendix Table I.7 shows that our results are robust to including retail mortgage bank share as a control variable. This can be explained by the fact that the retail mortgage bank share and the small business lending share are effectively uncorrelated, with a correlation of only -0.7%.

VI Conclusions

This paper examines the credit supply to small businesses in the aftermath of the 2008 financial crisis. We find that banks reduced lending while nonbanks stepped in to offset the "missing" bank lending. The increase in nonbank lending was broad-based, primarily driven by finance companies and FinTech lenders.

Using cross-sectional analysis, we document that nonbank lenders almost perfectly offset the decline in bank lending during the financial crisis. Regions with high dependence on banks before the 2008 financial crisis saw a greater drop in credit supply after the crisis. It is precisely in these counties that nonbank lenders expanded after 2010. To address borrower-level differences, we estimate within-firm regressions and use natural experiments to show that our results reflect a negative supply shock to the banking sector. Consistent with the

substitution of bank lending with nonbank lending, we show that there are no long-term real effects for small businesses.

Our paper highlights an important and, until now, ignored fact about the change in the composition of lenders to small businesses. While it may have been involuntary, small businesses have gradually shifted away from their reliance on banks. In fact, nonbank lenders provide 59% of new loans by 2016. We believe our paper is the first one to document this structural change. This is important because most prior work has almost exclusively focused on the role of banks and the relevance of bank-lending relationships. Going forward, it is crucial to expand our understanding of nonbanks, especially finance companies, and FinTech lenders, who differ from banks along many dimensions, such as their financing, their lending technology, and the regulation to which they are subject.

Our paper also helps contrast the growth of FinTech in small business lending to FinTech lending in other markets. Small business lending does not benefit from the type of support that the GSEs provide to online mortgage lenders. This implies that GSE support alone may not explain the entire rise of FinTech lenders in the residential mortgage market.

Rather, the convenience of online lending and the use of new technology also plays an important role. This is consistent with work on retail mortgages that shows that FinTech lenders are better able to process mortgage applications than brick-and-mortar banks when demand is high (Fuster, Plosser, Schnabl, and Vickery (2019)). It is also consistent with the reduced cost of processing applications, which makes it feasible for FinTech lenders to lend to smaller, younger, and more opaque firms (Mills and McCarthy (2014)). Frictions such as bank regulation that spurred the growth of nonbanks in other markets (for example, Buchak, Matvos, Piskorski, and Seru (2018) on mortgage markets, and Irani, Iyer, Meisenzahl, and Peydró (2020) on syndicated lending) may also be an important factor that contributed to the rise of nonbanks in small business lending.

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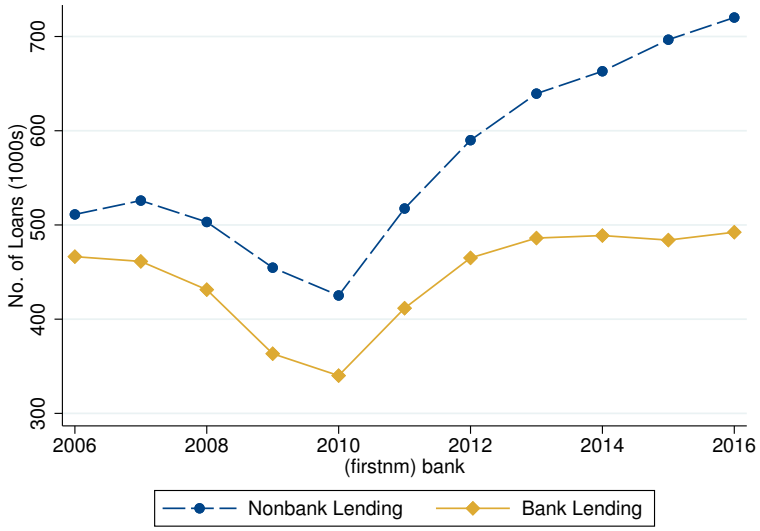
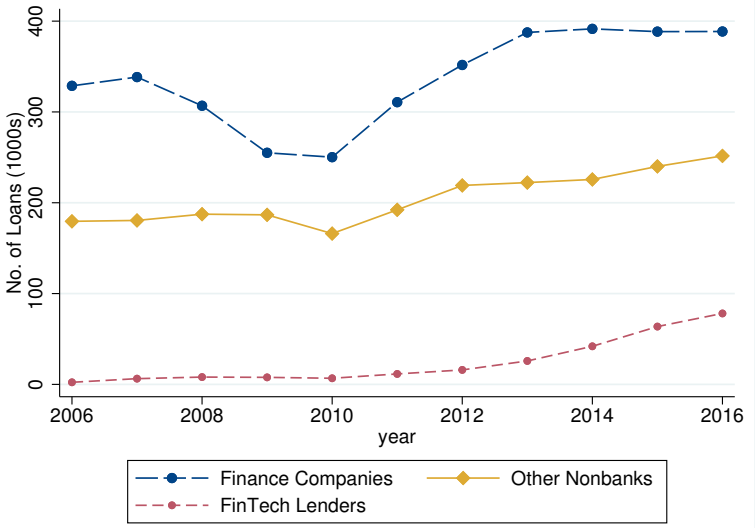
Figures

Figure 1: Number of New Loan Originations

Panel A: Bank vs. nonbank loan origination



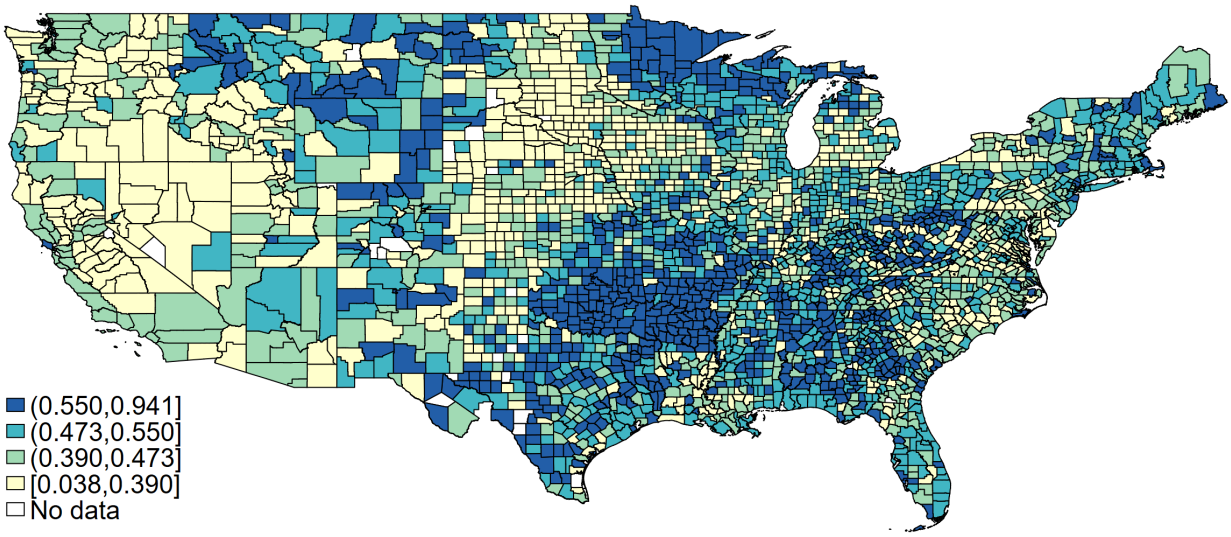
Panel B: Loan origination by nonbank lender type



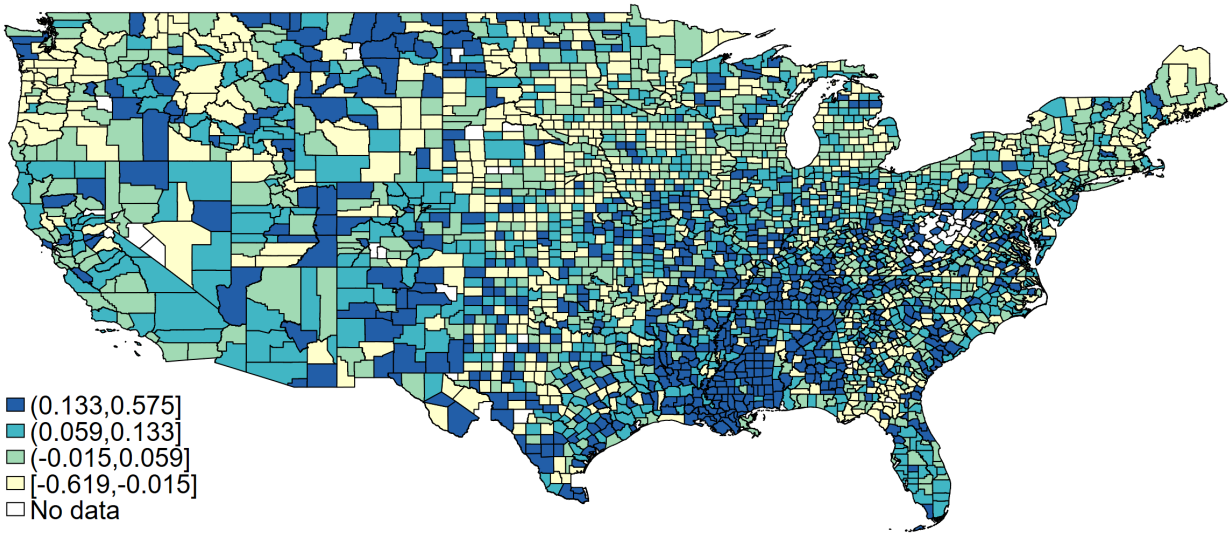
This figure plots the number of loans originated annually between 2006 and 2016. Panel A shows total bank and nonbank lending. Bank lending captures loans originated by depository institutions (commercial banks, credit unions, thrifts, and nonbank subsidiaries of bank holding companies). Nonbank Lending captures loans originated by all non-depository institutions. Panel B shows total lending for finance companies (sum of captive finance companies and independent finance companies), FinTech lenders, and Other nonbanks (sum of cooperatives, investment companies and non-financials). Data on loan originations is obtained from UCC filings.

Figure 2: Geographical Distribution of Bank Shares

Panel A: 2006 bank shares

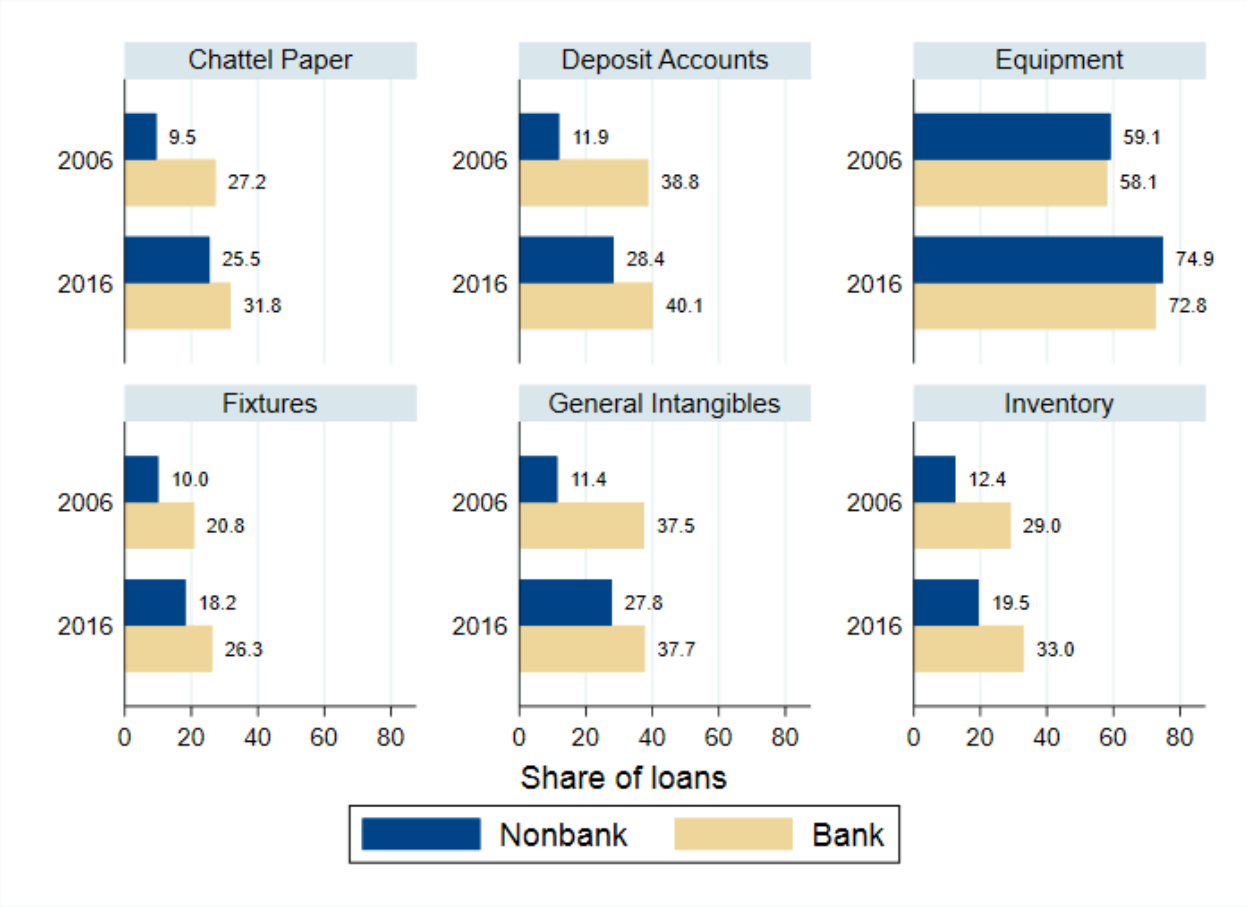


Panel B Change in nonbank shares (2007-16)



Panel A maps the geographical distribution of bank shares in the US in 2006. Bank share is the share of total county lending in 2006 originated by banks. Panel B maps the geographical distribution of change in nonbank market share between 2007 and 2016. Change in nonbank share is the change in the share of total county lending by nonbank lenders between 2007 and 2016. Data on loan originations is obtained from UCC filings.

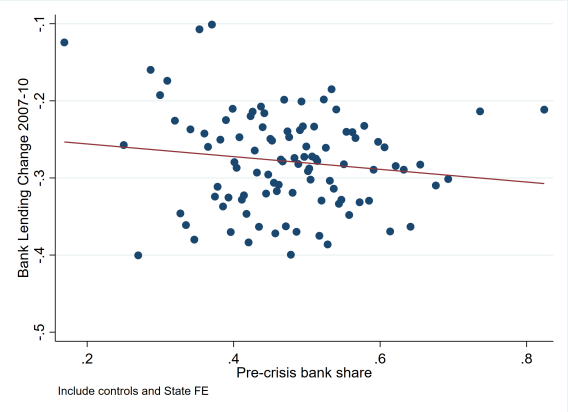
Figure 3: Borrower Collateral Composition



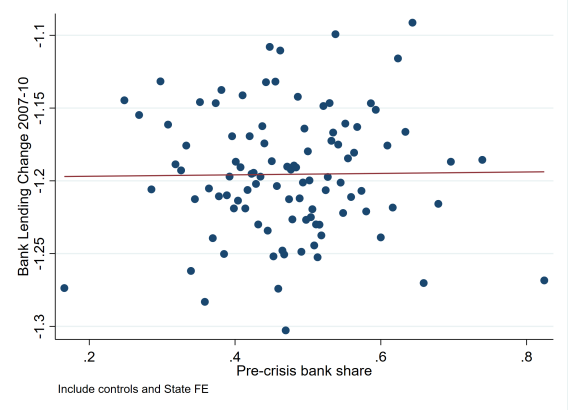
This figure depicts the share (in percentage) of bank and nonbank lending against the six most common types of collateral in our sample in 2006 and 2016. Shares can sum to greater than 100% because a single loan can have multiple types of collateral pledged. Data on loan originations and collateral pledged is obtained from UCC filings

Figure 4: Bank Lending Change, 2007–10

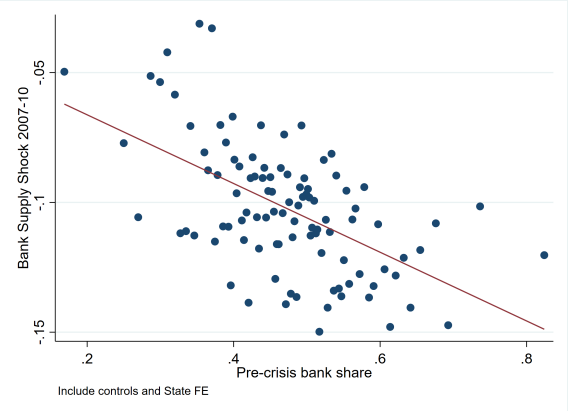
Panel A: Bank Lending, 2007–10 (UCC)



Panel B: Bank Lending, 2007–10 (CRA)



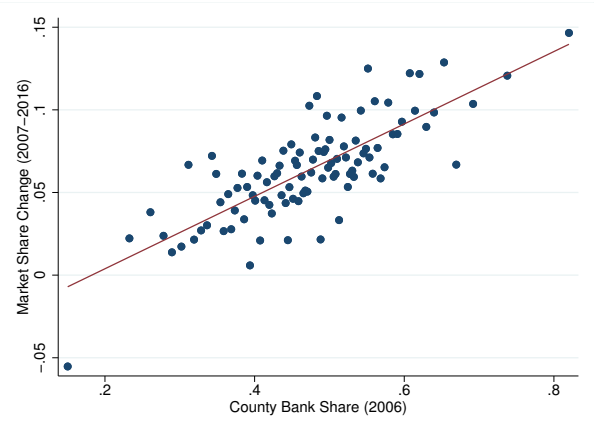
Panel C: Bank Supply Shock



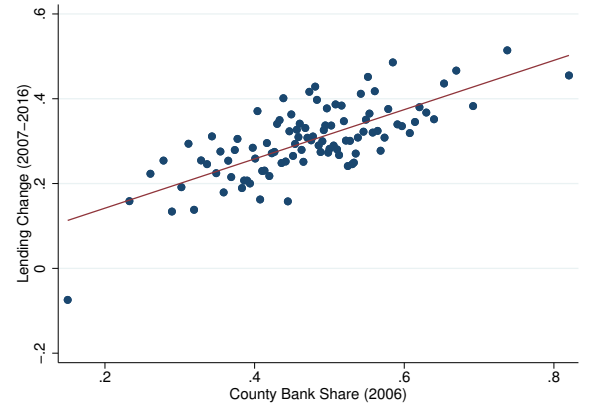
This figure plots a binned scatter plot of the log change in the number of bank loans in a county between 2007 and 2010 (Panels A and B) and bank supply shock (Panel C) on the regions' 2006 bank market shares as measured in the UCC data. Panel A plots the relationship in the UCC data and Panel B uses the CRA data. Bank supply shock (Panel C) is the change in bank lending between 2007 and 2010 as a share of total lending in the region in 2007. Residuals are plotted after including state fixed effects and county controls. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate, change in labor force participation rate, change in the number of establishments, and wage growth in the county between 2002–2006.

Figure 5: 2007-2016 Lending Growth at the County Level

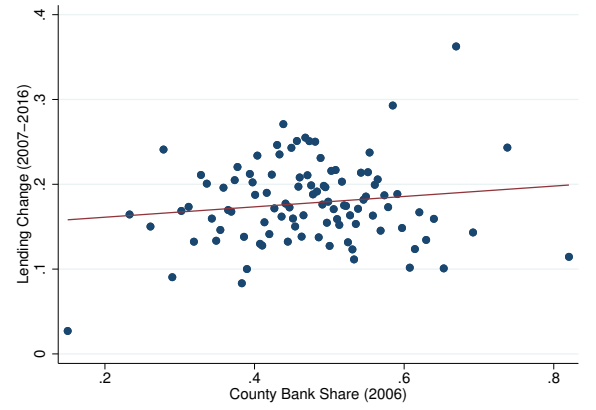
Panel A: Nonbank Market Share



Panel B: Nonbank Lending



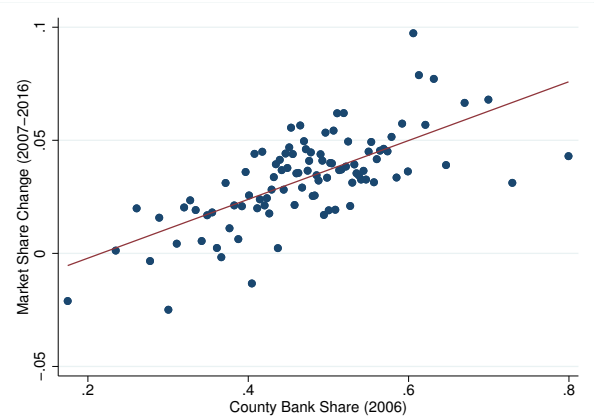
Panel C: Total Lending



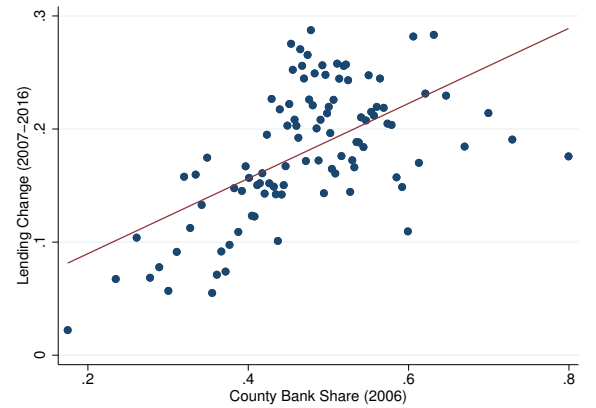
This figure presents binned scatter plots of change in nonbank market share (Panel A), nonbank lending (Panel B), and total lending (Panel C) from 2007 to 2016 at the county level as a function of 2006 county bank shares. County bank share represents the share of county lending that banks accounted for based on 2006 loan originations. Change in nonbank market share is measured as the change in the share of total county lending by nonbanks. Lending changes are measured as the log change in the number of loans. State fixed effects are included. Data on loan originations is obtained from UCC filings.

Figure 6: 2007-2016 Lending Growth at the County-Industry Level

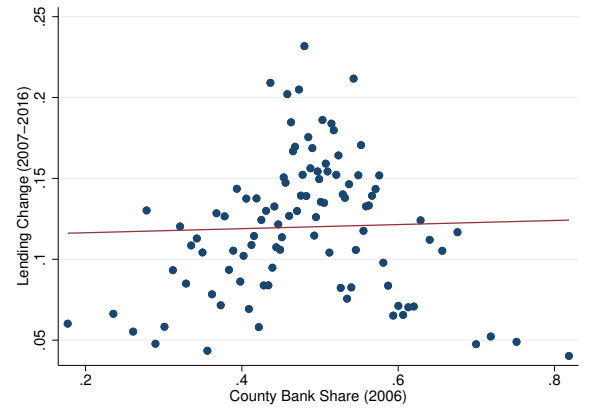
Panel A: Nonbank Market Share



Panel B: Nonbank Lending



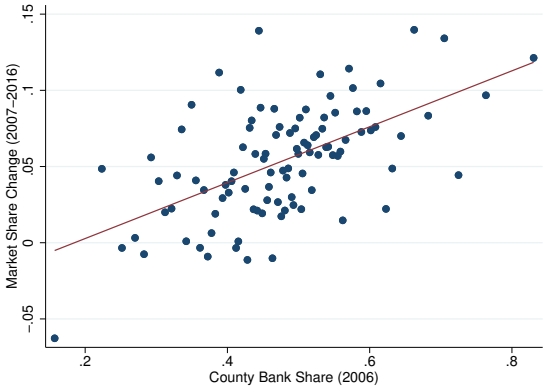
Panel C: Total Lending



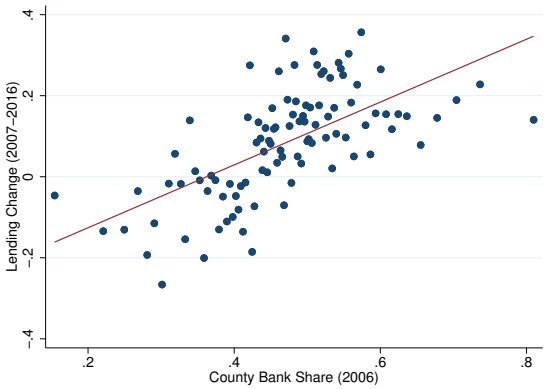
This figure presents binned scatter plots of change in nonbank market share (Panel A), nonbank lending (Panel B), and total lending (Panel C) from 2007 to 2016 at the county-industry level as a function of 2006 county bank shares. County bank share represents the share of county lending accounted for by banks based on 2006 loan origination. Change in nonbank market share is measured as the change in the share of total county-industry lending by nonbanks. Lending changes are measured as the log change in the number of loans. Two-digit SIC industry fixed effects (66 industries) are included. Data on loan originations is obtained from UCC filings.

Figure 7: 2007-2016 Lending Growth at the County-Collateral Level

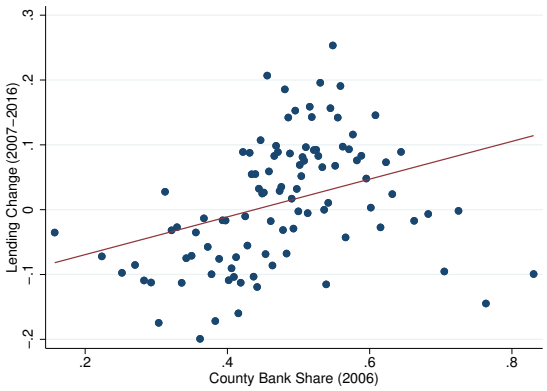
Panel A: Nonbank Market Share



Panel B: Nonbank Lending



Panel C: Total Lending



This figure presents binned scatter plots of change in nonbank market share (Panel A), nonbank lending (Panel B), and total lending (Panel C) from 2007 to 2016 at the county-collateral level as a function of 2006 county bank shares. County bank share represents the share of county lending that banks accounted for based on 2006 loan originations. Change in nonbank market share is measured as the change in the share of total county-collateral lending by nonbanks. Lending changes are measured as the log change in the number of loans. Loans with multiple types of collateral are assigned to the most common collateral in the sample. Collateral type fixed effects (23 types) are included. Data on loan originations is obtained from UCC filings.

Table 1: Summary Statistics - Largest Lenders

This table presents summary statistics for the largest 20 lenders in the sample. Average annual loans are the number of new loans per year from 2006 to 2016 based on UCC data. Bank is an indicator variable equal to one if the lender is a bank and zero otherwise. We collect the variables *Total Assets, Total Loans Outstanding, Long-term debt, and Short-term debt* from 2016 financial statements, where available.

Lender	Average Annual Loans	Bank	Total Assets (2016, mil $)	Loans Outstanding (2016, mil $)	Long-term debt (2016, mil $)	Short-term debt (% of assets)
John Deere	54,533	0	34,068	28,641	16,568.90	5388.9
Wells Fargo	28,787	1	1,727,235	24,436	232,061	1,339,390
U.S. Bank	26,780	1	441,010	10,818	51,723	343,142
CNH Capital America	25,582	0	14,043	12,825	3,267	500
Kubota Credit Corporation*	21,683	0				
General Electric Capital (2014)**	16,294	0	267,725	33,750	187,991	25,000
JPMorgan Chase Bank	15,563	1	2,082,803	13,653	397,216	1,480,238
Caterpillar Financial Services	14,603	0	33,615	26,212	20,537	7,094
Bank of America	14,131	1	1,677,490	29,370	137,249	1,334,032
Branch Banking and Trust	14,053	1	214,433	5,273	18,340	167,649
Snap-on Credit*	9,803	0				
Citizens Bank	7,651	1	116,940	2,461	17,367	83,233
De Lage Landen	7,171	0	39,434	28,525	27,542	4,796
AGCO Finance*	6,959	0	2,278		1610	176
Citibank	6,941	1	1,349,581	7,930	323,986	880,790
Bank of the West	6,761	1	83,730	2,468	9,279	62,277
TCF National Bank	6,660	1	21,455	2,373	1,709	17,390
Tower Loan*	6,659	0				
Toyota Motor Credit Corp***	6,402	0				
PNC Bank	5,748	1	355,999	4,030	54,236	262,381

Notes:
* Private finance company with no financial reports filed
** GE Capital sold most of its financial arms and became a private corporation in October 2015. Statistics are as of 2014.
*** Filings consolidated to include both consumer and business loans. Break up not available.

Table 2: Lender, Borrower, and Loan Summary Statistics

This table presents statistics on the lenders, borrowers, and at the loan-level in the UCC filings. The sample period is between 2006–2016. Bank lending captures loans originated by depository institutions (commercial banks, credit unions, thrifts, and nonbank subsidiaries of bank holding companies). Top4 refers to the four largest commercial banks by asset size (JPMorgan Chase, Bank of America, Wells Fargo, and Citibank, after adjusting for mergers). Small Banks (CRA) are non-top4 banks that are covered under CRA reporting requirements. Other small banks and credit unions refers to lending by small banks below the CRA reporting threshold and credit unions. Nonbank Lending captures loans originated by all non-depository institutions. Captive finance companies are nonbanks that are financing arms of manufacturing firms.

Panel A: Banks and Nonbank Lenders

This panel presents statistics on the number of lenders and the average number of loans originated by lender type.

	Number of Lenders		Average number of loans		Total number of loans
	≥100 loans	≥1500 loans	≥100 loans	≥1500 loans	
Bank	3,756	347	1248	10,055	4,890,236
Nonbank	3,836	409	1405	10,406	6,246,782

Panel B: Lenders by Lender Type

This panel presents the type of lenders in the sample. Column presents the count of lenders with at least 1,500 loans in the sample. Columns 2 and 3 provide total lending and average number of loans by year for all lenders by category.

	Count (≥1500 loans)	Total Sample	Avg per year
Banks	**347**	**4,890,236**	**444,567**
Top4 Banks	4	750,251	68,205
Small Banks (CRA)	237	2,756,304	250,573
Other Small Banks and Credit Unions	106	1,383,681	125,789
Nonbanks	**409**	**6,246,782**	**567,889**
Captive Finance	91	2,294,946	208,631
Independent Finance	187	1,402,849	127,532
Fintech	20	268,359	24,396
Cooperatives	30	301,852	27,441
Investment Companies	29	121,975	11,089
Other Nonbanks	52	1,856,801	168,800
Total	**756**	**11,137,018**	**1,012,456**

Panel C: Loan Origination by Lender Type

This panel presents the change in loan origination by lender type between 2006 and 2016.

	2006	2010	2016	Δ2006-10(%)	Δ2010-16(%)	Δ2006-16(%)
Banks	**466,373**	**340,088**	**492,307**	**-27.08**	**44.76**	**5.56**
Top4 Banks	79,236	51,201	73,084	-35.38	42.74	-7.76
Small Banks - covered by CRA	262,002	191,931	281,030	-26.74	46.42	7.26
Other Small Banks and Credit Unions	125,135	96,956	138,193	-22.52	42.53	10.44
Nonbanks	**511,180**	**425,155**	**720,159**	**-16.83**	**69.39**	**40.88**
Captive Finance	216,164	156,779	205,669	-27.47	31.18	-4.86
Independent Finance	112,580	93,426	182,927	-17.01	95.80	62.49
Fintech	2,314	6,763	78,142	192.26	>>100	>>100
Cooperatives	17,643	23,483	30,686	33.10	30.67	73.93
Investment Companies	11,571	6,930	11,802	-40.11	70.30	2.00
Other Nonbanks	150,908	137,774	210,933	-8.70	53.10	39.78
Total	**977,553**	**765,243**	**1,212,466**	**-21.72**	**58.44**	**24.03**

Panel D: Borrower Industry

This panel compares the likelihood of each borrower industry across the different lender types.

	Full Sample	Banks	Nonbanks	Captive	Independent	FinTech
	Mean	Mean	Mean	Mean	Mean	Mean
Agriculture	0.151	0.105	0.187	0.282	0.090	0.026
Construction	0.110	0.120	0.103	0.141	0.093	0.084
Manufacturing/ Mining	0.115	0.113	0.116	0.101	0.120	0.074
Retail Trade	0.116	0.112	0.119	0.069	0.124	0.230
Services	0.347	0.390	0.313	0.285	0.358	0.401
Transportation	0.049	0.049	0.049	0.038	0.057	0.074
Wholesale Trade	0.072	0.076	0.068	0.060	0.067	0.059
Other	0.040	0.034	0.045	0.024	0.091	0.054
Obs.	11,137,018	4,890,236	6,246,782	2,294,946	1,402,849	268,359

Panel E: Firm Size Distribution

This panel compares borrower sizes across lenders. Data on firm size is obtained from Dun & Bradstreet data and is only available as of 2016.

	2016					
	All	Bank	Nonbank	Captive	Independent	FinTech
Employment (Mean)	42	40	43	45	41	18
Employment (Median)	6	6	6	4	7	4
Sales (1000s, Mean)	8876	8551	9099	10045	8385	3013
Sales (1000s, Median)	284	354	250	306	179	248
Obs.	1,212,466	492,307	720,159	205,669	182,927	78,142

Panel F: Loan Characteristics

This panel provides loan characteristics, where available. The number of loans refers to the number of loans between an individual borrower and lender. Maturity is the number for months between origination and termination filings for all loans that have both filings. Loan size is obtained from the EDA data and covers equipment lending only. We use the full sample of 11.1 million loans to measure the number of loans between a borrower and lender. Loan size is based on 2.5 million loans in the EDA data, and information on maturity is available for 2.7 million loans.

	All	Banks	Nonbanks	Captive	Independent	FinTech
No Loans (Mean)	3.43	2.41	2.95	2.17	1.58	1.29
No Loans (Median)	2.00	1.00	1.00	1.00	1.00	1.00
Loan Size	128,826	122,402	132,902	128,481	148,243	93,596
Maturity (months)	31.75	36.26	27.52	31.62	22.98	19.07

Panel G: Collateral

This panel compares the collateral pledged in loans originated by the lender for the six most common types of collateral pledged. Shares can sum up to over 100 because a borrower can pledge multiple types of collateral in a loan.

	Full Sample	Banks	Nonbanks	Captive	Independent	FinTech
	Mean	Mean	Mean	Mean	Mean	Mean
Equipment	0.662	0.650	0.672	0.738	0.700	0.655
Deposit Accounts	0.317	0.413	0.241	0.254	0.141	0.565
General Intangibles	0.300	0.389	0.231	0.254	0.136	0.607
Chattel Paper	0.251	0.301	0.212	0.253	0.118	0.569
Inventory	0.231	0.319	0.162	0.056	0.116	0.536
Fixtures	0.178	0.246	0.125	0.029	0.139	0.265
Obs.	11,137,018	4,890,236	6,246,782	2,294,946	1,402,849	268,359

Table 3: County Summary Statistics

This table presents summary statistics at the county level. Median is based on 2006 county bank shares. County bank share represents the share of county lending that banks accounted for based on 2006 loan originations. Data on loan originations is obtained from UCC filings.

	Full Sample		Below Median		Above Median	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Lending Growth (2007-16)						
Δ(Nonbank Lending)$_{2007-16}$	0.300	0.506	0.212	0.475	0.389	0.521
Δ(Nonbank Market Share)$_{2007-16}$	0.062	0.125	0.037	0.121	0.088	0.124
Δ(Total Lending)$_{2007-16}$	0.178	0.436	0.149	0.415	0.207	0.455
Real Outcomes (2007-16)						
Δ(Employment)$_{2007-16}$	-0.021	0.147	-0.021	0.149	-0.021	0.146
Δ(Establishments)$_{2007-16}$	-0.057	0.094	-0.058	0.092	-0.056	0.095
Δ(Wages)$_{2007-16}$	0.227	0.102	0.235	0.103	0.219	0.101
Δ(Expansion Rate)$_{2007-14}$	0.004	0.046	0.004	0.048	0.004	0.044
Control Variables						
Bank Share$_{2006}$	0.473	0.132	0.371	0.080	0.575	0.087
Top4 Deposit Share$_{2005}$	0.105	0.167	0.120	0.186	0.091	0.145
Population$_{2005}$	95,854	306,011	93,127	348,276	98,583	256,938
Unemployment Rate$_{2005}$	5.423	1.741	5.364	1.835	5.481	1.641
Labor Force Participation Rate$_{2005}$	0.491	0.062	0.495	0.062	0.486	0.061
Average Wage ('1000s \$)$_{2005}$	27.651	6.587	27.596	6.720	27.705	6.453
Δ(Labor Force)$_{2002-2006}$	0.031	0.070	0.027	0.069	0.035	0.070
Δ(Unemployment Rate)$_{2002-2006}$	-0.812	1.151	-0.827	1.170	-0.797	1.133
Δ(Establishments)$_{2002-2006}$	0.027	0.082	0.025	0.085	0.028	0.080
Δ(Wage)$_{2002-2006}$	0.139	0.105	0.139	0.103	0.139	0.106
Observations	3079		1540		1539	

Table 4: Lending Growth at the County Level

This table presents county-level regressions for change in loan originations between 2007 and 2016. Change in nonbank market share is measured as the change in the share of total county lending by nonbanks. Lending change is measured as the log change in the number of new loan originations and is winsorized at the 1% level. Bank Share measures the share of bank lending in the county in 2006. Panel A includes state fixed effects. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are clustered at the county level.

Panel A: Including State Fixed Effects and Controls

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.218***	0.553***	0.026
	(0.024)	(0.077)	(0.059)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,006	3,006	3,006
R^2	0.226	0.522	0.564

Panel B: Including Controls

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.213***	0.649***	0.114*
	(0.019)	(0.071)	(0.060)
Controls	Y	Y	Y
State FE	N	N	N
Obs.	3,006	3,006	3,006
R^2	0.083	0.122	0.080

Table 5: Lending Growth at County-Industry and County-Collateral Level

This table presents county-industry (Panel A) and county-collateral (Panel B) level regressions for change in loan originations between 2007 and 2016. Change in nonbank market share is measured as the change in the share of total county-industry (Panel A) or county-collateral (Panel B) lending by nonbanks. Lending change is measured as the log change in the number of new loan originations and is winsorized at the 1% level. Bank Share measures the share of bank lending in the county in 2006. In Panel A, industry is measured at the two-digit SIC level (64 industries) and includes two-digit industry and state fixed effects. In Panel B, a loan is counted as belonging to a collateral category if the specified type of collateral is pledged in the loan. Loans with multiple collateral types are assigned to the most common (in sample) collateral type. Panel B includes collateral-type and state fixed effects. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are double clustered at the county and industry levels (Panel A) and at the county and collateral levels (Panel B).

Panel A: Two-digit SIC Industry

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$(County)	0.115***	0.248***	−0.066
	(0.023)	(0.070)	(0.060)
Industry FE	Y	Y	Y
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	35,019	35,019	35,019
R^2	0.030	0.160	0.220

Panel B: Collateral

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$(County)	0.211***	0.497**	0.035
	(0.049)	(0.175)	(0.114)
Collateral FE	Y	Y	Y
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	9,791	9,791	9,791
R^2	0.167	0.338	0.326

Table 6: Within-firm estimation

This table presents changes in firm-level lending. The dependent variable is an indicator variable equal to 1 if the firm receives a repeat loan and zero otherwise. A loan is a repeat loan if the firm obtains a new loan from the same lender type in 2008–16 as in 2006–07 (pre-period). Sample in Panel A is restricted to firms with both bank and nonbank loans in the pre-period. Sample in Panel B is restricted to firms that had loans from only one type of lender in the pre-period. Nonbank is an indicator variable equal to 1 if the lender is a nonbank and zero otherwise. Industry fixed effects are at the four-digit SIC level. The regression is weighted by the number of loans to the firm from the lender type in 2006–07 in Columns 2–4.

Panel A: Firms with loans from both banks and nonbanks

	(1)	(2)	(3)	(4)
Nonbank	0.034***	0.033***	0.043***	0.049***
	(0.008)	(0.006)	(0.006)	(0.006)
Firm FE	Y	Y	N	N
County FE	N	N	Y	Y
Industry FE	N	N	Y	N
Weighted	N	Y	Y	Y
Obs.	292,260	292,260	292,260	292,260
Cluster	County, Ind	County, Ind	County, Ind	County, Ind
R^2	0.646	0.701	0.088	0.032

Panel B: Firms with loans from either a bank or a nonbank

	(1)	(2)	(3)	(4)
Nonbank	0.029***	0.053***	0.091***	0.096***
	(0.008)	(0.008)	(0.010)	(0.013)
Firm FE	N	N	N	N
County FE	Y	Y	Y	N
Industry FE	Y	Y	N	N
Weighted	N	Y	Y	Y
Obs.	821,046	821,046	821,046	821,056
Cluster	County, Ind	County, Ind	County, Ind	County, Ind
R^2	0.073	0.099	0.045	0.010

Table 7: Natural Experiments

This table presents county-level regressions of the change in loan originations between 2007 and 2016 on FAS Share (Panel A), stress-test share (Panel B), bank capital change (Panel C). Lending change is measured as the change in the number of new loan originations and is winsorized at the 1% level. FAS Share measures the share of lending by banks affected by FAS166/167 in the county in 2007. Stress-test Share measures the share of lending by stress tested banks in the county in 2007. Bank capital change is the weighted average of the percentage point change in bank Tier 1 risk-based capital in the county between 2007 and 2016 and is winsorized at 1%. The estimations include state fixed effects. Controls include the county unemployment rate, labor force participation rate, and average wage in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are clustered at the county level.

Panel A: FAS 166/167

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
FAS Share_{07}	0.303***	0.592***	0.009
	(0.058)	(0.147)	(0.122)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,011	3,011	3,011
R^2	0.206	0.510	0.561

Panel B: Stress-tested banks

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Stress-test Share_{07}	0.265***	0.493***	0.016
	(0.044)	(0.127)	(0.099)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,011	3,011	3,011
R^2	0.208	0.510	0.561

Panel C: Bank Capital

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
$\Delta(\text{Cap})_{07-16}$	0.027***	0.064***	0.007
	(0.004)	(0.011)	(0.008)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,011	3,011	3,011
R^2	0.212	0.514	0.562

Table 8: Bank-Owned vs. Independent Finance Companies

This table displays the results on lending changes between 2007 and 2016 at the county level. Change in market share is measured as the change in the share of total county lending by the lender type. Bank Share measures the share of bank lending in the county in 2006. Bank-owned finance companies are wholly owned nonbank subsidiaries of bank holding companies. Independent finance companies are finance companies that are owned neither by manufacturers nor by banks. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002-2006. Standard errors are clustered at the county level.

	2007-2016	
	(1) Bank-Owned Finance Company Market Share	(2) Independet Finance Company Market Share
Bank Share$_{06}$	-0.030^{***}	0.049^{***}
	(0.011)	(0.018)
Controls	Y	Y
State FE	Y	Y
Obs.	2,213	2,213
R^2	0.122	0.578

Table 9: Real Effects (2007–16)

This table presents results on the real effects of the substitution to nonbank lending. Bank Share measures the share of bank lending in the county in 2006. Outcome variables are the log change in the number of establishments (Column 1), log change in the number of employees (Column 2), log change in average wages (measured as the share of payroll per employee; Column 3), and change in expansion rate (measured as the fraction of establishments that increase employment in a given year; Column 4) between 2007 and 2016. The expansion rate is only available until 2014. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are clustered at the county level in Panel A. Panel B measures outcome variables at the county-industry (two-digit NAICS) level, and the standard errors are double clustered at the county and industry level.

Panel A- County Level

	(1) Δ(Establishments)	(2) Δ(Employment)	(3) Δ(Wages)	(4) Δ(Expansion Rate)
Bank Share$_{06}$	−0.004	−0.038	−0.024	0.017*
	(0.016)	(0.028)	(0.018)	(0.009)
Controls	Y	Y	Y	Y
State FE	Y	Y	Y	Y
Obs.	3021	3021	3021	3021
R^2	0.315	0.140	0.211	0.188

Panel B- County-Industry Level

	(1) Δ(Establishments)	(2) Δ(Employment)	(3) Δ(Wages)	(4) Δ(Expansion Rate)
Bank Share$_{06}$	−0.001	−0.031	0.024	0.015**
	(0.021)	(0.032)	(0.045)	(0.006)
Industry FE	Y	Y	Y	Y
Controls	Y	Y	Y	Y
State FE	Y	Y	Y	Y
Obs.	34748	34748	34748	34748
R^2	0.177	0.061	0.047	0.057

Appendix A Additional Figures

Figure A1: Sample UCC Filing

[redacted]

File Number: 20180091764K
Date Filed: 9/5/2018 11:53:00 AM
Elaine F. Marshall
NC Secretary of State

UCC FINANCING STATEMENT
FOLLOW INSTRUCTIONS

A. NAME & PHONE OF CONTACT AT FILER (optional)
Corporation Service Company

B. E-MAIL CONTACT AT FILER (optional)
FilingDept@cscinfo.com

C. SEND ACKNOWLEDGMENT TO: (Name and Address)

Corporation Service Company
801 Adlai Stevenson Dr
Springfield, IL 62703

THE ABOVE SPACE IS FOR FILING OFFICE USE ONLY

1. DEBTOR'S NAME: Provide only one Debtor name (1a or 1b) (use exact, full name; do not omit, modify, or abbreviate any part of the Debtor's name); if any part of the Individual Debtor's name will not fit in line 1b, leave all of item 1 blank, check here ☐ and provide the Individual Debtor information in item 10 of the Financing Statement Addendum (Form UCC1Ad)

1a. ORGANIZATION'S NAME
First Choice Landscaping, Inc.

OR

1b. INDIVIDUAL'S SURNAME	FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX

1c. MAILING ADDRESS	CITY	STATE	POSTAL CODE	COUNTRY
596 BURRAGE ROAD	**CONCORD**	**NC**	**28025**	**USA**

2. DEBTOR'S NAME: Provide only one Debtor name (2a or 2b) (use exact, full name; do not omit, modify, or abbreviate any part of the Debtor's name); if any part of the Individual Debtor's name will not fit in line 2b, leave all of item 2 blank, check here ☐ and provide the Individual Debtor information in item 10 of the Financing Statement Addendum (Form UCC1Ad)

2a. ORGANIZATION'S NAME

OR

2b. INDIVIDUAL'S SURNAME	FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX

2c. MAILING ADDRESS	CITY	STATE	POSTAL CODE	COUNTRY

3. SECURED PARTY'S NAME (or NAME of ASSIGNEE of ASSIGNOR SECURED PARTY): Provide only one Secured Party name (3a or 3b)

3a. ORGANIZATION'S NAME
Wells Fargo Vendor Financial Services, LLC

OR

3b. INDIVIDUAL'S SURNAME	FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX

3c. MAILING ADDRESS	CITY	STATE	POSTAL CODE	COUNTRY
PO Box 35701	**Billings**	**MT**	**59107**	**USA**

4. COLLATERAL: This financing statement covers the following collateral:

This Financing Statement covers the equipment and other assets described below and/or on any annex, schedule and/or exhibit hereto (which is to be considered an integral part hereof), plus all existing and future replacements, exchanges and substitutions therefor, attachments, accessories, accessions and additions thereto, and insurance, lease, sublease and other proceeds thereof.

Equipment: ONE (1) BOBCAT COMPACT TRACK LOADER, MODEL#: T595 S/N: B3NK18740
ONE (1) BOBCAT SOIL CONDITIONER, MODEL#: 72in HYDRAULIC S/N: S6TE03123
ONE (1) BOBCAT TRENCHER, MODEL#: LT313 3FT DEPTH S/N: 045414032
ONE (1) BOBCAT SOIL CONDITIONER, MODEL#: 84in HYDRAULIC S/N: A6TG03041

Internet Appendix

Appendix I.1 Additional tables and figures

Table I.1: Additional Summary Statistics

Median is based on 2006 county bank shares. County bank share represents the fraction of county lending that banks accounted for based on 2006 loan originations. Data on loan originations is obtained from UCC filings.

Panel A: County-Industry (two-digit SIC) Summary Statistics

	Full Sample		Below Median		Above Median	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Δ(Nonbank Lending)$_{2007-16}$	0.202	0.868	0.167	0.858	0.232	0.876
Δ(Nonbank Market Share)$_{2007-16}$	0.041	0.232	0.032	0.229	0.049	0.234
Δ(Total Lending)$_{2007-16}$	0.118	0.684	0.106	0.679	0.129	0.689
Observations	35025		16193		18832	

Panel B: County-Collateral Summary Statistics

	Full Sample		Below Median		Above Median	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Δ(Nonbank Lending)$_{2007-16}$	0.133	1.223	0.062	1.199	0.194	1.241
Δ(Nonbank Market Share)$_{2007-16}$	0.048	0.227	0.033	0.226	0.061	0.226
Δ(Total Lending)$_{2007-16}$	0.026	1.081	-0.009	1.047	0.057	1.109
Observations	9864		4608		5256	

Table I.2: Annual Impact of Bank-shares on Firm Funding Availability

This table presents results on lending changes at the firm level. The dependent variable is a dummy that takes a value of 1 if the firm gets a new loan (Column 1), a new loan from a nonbank (Column 2), and a new loan from a bank (Column 3) in the given year and zero otherwise. The sample is a balanced panel of all firm-year observations between 2006 and 2016. Bank Share measures the share of bank lending in the county in 2006. Standard errors are clustered at the county and four-digit SIC industry levels.

	(1)	(2)	(3)
	New Loan	Nonbank Loan	Bank Loan
Bank Share$_{06}$ x 2007	−0.023***	0.013***	−0.039***
	(0.005)	(0.003)	(0.005)
Bank Share$_{06}$ x 2008	−0.026***	0.018***	−0.046***
	(0.007)	(0.005)	(0.006)
Bank Share$_{06}$ x 2009	−0.020***	0.024***	−0.047***
	(0.008)	(0.006)	(0.006)
Bank Share$_{06}$ x 2010	−0.022**	0.042***	−0.063***
	(0.009)	(0.007)	(0.007)
Bank Share$_{06}$ x 2011	−0.037***	0.022***	−0.059***
	(0.010)	(0.008)	(0.006)
Bank Share$_{06}$ x 2012	−0.041***	0.012	−0.052***
	(0.010)	(0.009)	(0.006)
Bank Share$_{06}$ x 2013	−0.034***	0.020**	−0.051***
	(0.009)	(0.008)	(0.006)
Bank Share$_{06}$ x 2014	−0.013	0.041***	−0.047***
	(0.014)	(0.009)	(0.008)
Bank Share$_{06}$ x 2015	−0.003	0.051***	−0.048***
	(0.020)	(0.013)	(0.011)
Bank Share$_{06}$ x 2016	0.038	0.081***	−0.035**
	(0.042)	(0.026)	(0.018)
Firm FE	Y	Y	Y
Year FE	Y	Y	Y
Obs.	36,662,439	36,662,439	36,662,439
R^2	0.171	0.210	0.168

Table I.3: County Lending - Bank Supply Shock (IV)

This table presents county-level regressions of the change in loan originations between 2007 and 2016 on change in bank supply. Lending change is measured as the change in the number of new loan originations and is winsorized at the 1% level. Bank Supply measures the change in number of bank loans in the county between 2007 and 2010 scaled by the total lending in the county in 2007. Bank Supply is instrumented by pre-crisis bank share in the county in 2006. The estimations include state fixed effects. Controls include the county unemployment rate, labor force participation rate, average wage, and share of mortgage lending by banks in 2006. In addition, the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006 are also included as controls. Standard errors are clustered at the county level.

Panel A - IV Results

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Supply$_{07-10}$	-1.653^{***}	-4.193^{***}	-0.206
	(0.302)	(0.993)	(0.458)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,004	3,004	3,004
F-stat	25.523	25.523	25.523

Panel B- First Stage

	Bank Supply Shock 2007-2010		
	(1)	(2)	(3)
BankShare$_{2006}$	-0.165^{***}	-0.154^{***}	-0.132^{***}
	(0.022)	(0.022)	(0.026)
Controls	N	Y	Y
State FE	N	N	Y
Obs.	3,004	3,004	3,004
R^2	0.025	0.081	0.228

Table I.4: Top 4 Deposit Share

This table displays the results on lending changes at the county level. Change in nonbank market share is measured as the change in the share of total county lending by nonbanks. Lending change is measured as the change in the log number of new loans and is winsorized at the 1% level. Bank Share measures the share of bank lending in the county in 2006. Top4 deposit share is measured as of 2005. Top4 refers to the four largest commercial banks by asset size (JPMorgan Chase, Bank of America, Wells Fargo, and Citibank, after adjusting for mergers). Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are clustered at the county level.

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.218***	0.555***	0.028
	(0.024)	(0.077)	(0.059)
Top4 Deposit Share	0.047**	0.176***	0.109**
	(0.020)	(0.068)	(0.051)
State FE	Y	Y	Y
Controls	Y	Y	Y
Obs.	3,003	3,003	3,003
R^2	0.229	0.524	0.566

Table I.5: Large County Results

This table displays the results on lending changes at the county level. Change in nonbank market share is measured as the change in the share of total county lending by nonbanks. Lending change is measured as the change in the log number of new loans and is winsorized at the 1% level. Bank Share measures the share of bank lending in the county in 2006. Controls include the county unemployment rate, labor force participation rate, average wage, and log population in 2005, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. The population estimate is based on 2005 levels. Standard errors are clustered at the county level.

Panel A: Weighted by total county lending in 2007

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.285***	0.757***	0.097
	(0.047)	(0.194)	(0.119)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,003	3,003	3,003
R^2	0.393	0.633	0.647

Panel B: Weighted by county population

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.239***	0.652***	0.098
	(0.034)	(0.125)	(0.081)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,003	3,003	3,003
R^2	0.414	0.675	0.693

Panel C: Largest 100 counties by population

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.778***	1.593**	0.125
	(0.133)	(0.670)	(0.567)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	88	88	88
R^2	0.720	0.714	0.676

Table I.6: Per-capita Lending Growth at the County Level

This table presents county-level regressions of the change in loan originations between 2007 and 2016 on bank share. Lending change is measured as the absolute change in the number of new loan originations scaled by the population of the county in 2005 (in millions) and is winsorized at the 1% level. Bank Share measures the share of bank lending in the county in 2006. The estimations include state fixed effects. Controls include the county unemployment rate, labor force participation rate, and average wage, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. Standard errors are clustered at the county level.

	2007-2016		
	(1)	(2)	(3)
	Bank Lending	Nonbank Lending	Total Lending
Bank Share$_{06}$	−939.975***	1009.504***	−31.931
	(262.342)	(343.450)	(478.745)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	3,006	3,006	3,006
R^2	0.184	0.382	0.365

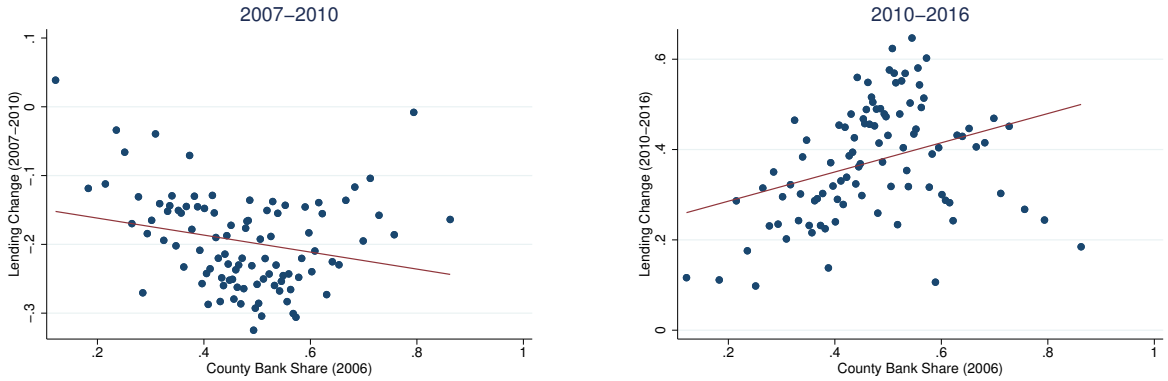
Table I.7: County Lending with HMDA controls

This table presents county-level regressions of the log change in loan originations between 2007 and 2016 on bank share. Lending change is measured as the change in the number of new loan originations and is winsorized at the 1% level. Bank share measures the share of lending by banks in the county in 2006. Controls include the county unemployment rate, labor force participation rate, average wage, and share of mortgage lending by banks in 2006, as well as the change in the unemployment rate in the county, change in labor force participation rate in the county, change in the number of establishments in the county, and wage growth in the county between 2002–2006. We also include the share of mortgage lending by banks in the county in 2006 based on HMDA data. Standard errors are clustered at the county level.

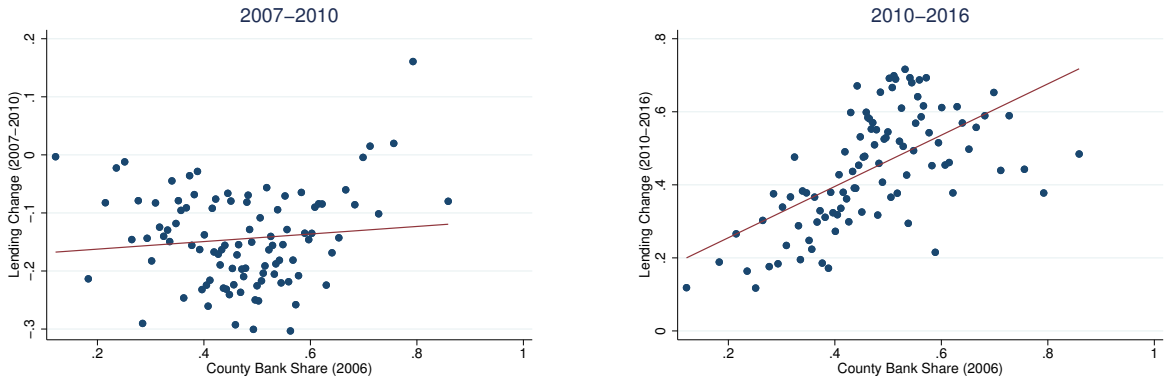
	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share$_{06}$	0.228***	0.566***	0.017
	(0.024)	(0.078)	(0.060)
Controls	Y	Y	Y
State FE	Y	Y	Y
Obs.	2,941	2,941	2,941
R^2	0.237	0.534	0.575

Figure I.1: County Lending (Subperiods)

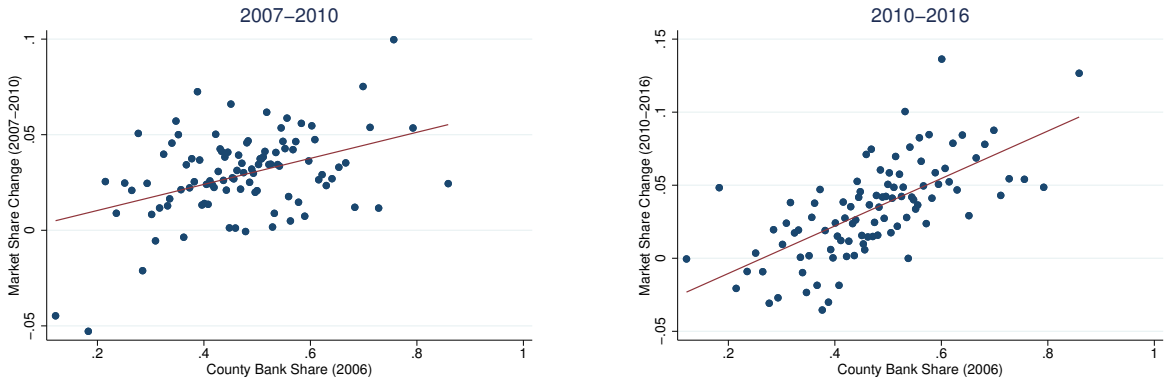
Panel A: Total Lending



Panel B: Nonbank Lending



Panel C: Nonbank Market Share



This figure presents binned scatter plots of change in total lending (Panel A), change in nonbank lending (Panel B), and change in nonbank market shares (Panel C) between 2007 and 2010 (financial crisis) and between 2010 and 2016 (post-crisis period) at the county-level as a function of 2006 county bank shares. County bank share represents the share of county lending accounted for by banks based on 2006 loan origination. Lending changes are measured as the log change in the number of loans. Change in nonbank market share is measured as the change in the share of total county lending by nonbanks. Data on loan originations is obtained from UCC filings.

Appendix I.2 Data description

I.2.1 UCC data cleaning

Uniform Commercial Code (UCC) filings provide public notice of secured transactions in the US. By properly filing a *Financing Statement* at the state and/or local jurisdiction, the security interest of the secured party is perfected. A financing statement is proof of a security interest in personal property whereas a deed, properly recorded at a county records office, is proof of ownership for real property (land and buildings).

We received our data from a commercial vendor that covers UCC filings across all US states and territories from 2006 to 2016. The vendor collects UCC filing information on the borrower's name and address, the lender's name and address, and information on when the filing was made. The vendor further classifies collateral into 34 broad categories. If there is more than one type of collateral pledged, the vendor lists all types. The vendor adds the DUNS number, which is a widely used business identifier created by Dun & Bradstreet (D&B). The vendor also attaches industry information (four-digit SIC code), location information (FIPS county identifier). The dataset also includes firm characteristics such as ownership and size (employment and sales) as of the most recent point (i.e., 2016 for our sample). We use the DUNS number to link borrowers across filings and over time.[23]

UCC filings can be classified into...

- Original filing: the initial filing of the financing statement (commonly referred to as a "UCC 1").
- Amendment: any changes made to the originally filed Financing Statement is performed through the filing of an amendment (commonly referred to as a "UCC 3").
- Continuation: an amendment to the original filing which extends the effective period of the filing. Most filings are effective for a five year period and within six months of expiration a continuation must be filed to keep the financing statement in effect.
- Termination: an amendment filing that terminates, discontinues, the secured party's interest to the collateral covered in the financing statement.
- Assignment: an amendment that changes the security interest from one secured party to another.

[23] Almost all businesses in the US have a DUNS number. We drop businesses without a DUNS number.

- Release: an amendment filing that "releases" the debtor from the security interest of specified collateral.

- Subordination: an amendment filing that subordinates (places behind) the security interest of the financing statement to another security interest that is described in the filing.

For all analyses in this paper, we focus on initial UCC filings (filing type = 2 in the database provided by the vendor). We believe initial filings best capture new loan originations. By dropping loan continuations, amendments, and assignments we prevent double counting the same loan. An important caveat, however, is that a single initial filing can span multiple loans within its validity period and UCC filings may better capture "relationships." Thus, we may be potentially undercounting loan originations by only focusing on UCC-1 filings.[24] We use UCC filing termination data, where available, to provide summary statistics on loan maturity.

We start by dropping loans made by federal or state governments since these loans are usually government guaranteed. The most common of these are loans made by the Small Business Administration (SBA Loans). They also include loans made by the Department of Agriculture, Department of Housing and Urban Development, the Department of Energy, and the Department of Justice. Federal liens on business assets, such as ones placed by the IRS or local state agencies are also dropped. We further drop all loans made to financial firms (SIC codes 60–67), utilities (SIC code 49), public administration (SIC codes 91–98), and the United States Postal Service (SIC code 4311). Our sample is also restricted to the 48 contiguous US states and we drop records from US territories, Alaska, and Hawaii. Our final sample consists of 11.14 million loans.

While borrowers can be linked across filings using the DUNS number, the data does not include a common identifier for lenders, and hence, we construct our own.[25] We start by creating consistent names by removing common leading and trailing patterns (LLC, Corp., etc.), expanding common abbreviations, fixing common typos, removing special characters, and removing non-name descriptions in the name field. After this, we manually inspect lender names to generate a uniform moniker. For lenders with at least 1,500 loans from 2006 to 2016, we manually classify their type (e.g., bank, finance company, FinTech lender). This procedure covers the largest 756 lenders, which make 70% of total loans.

We classify a lender as a bank if the lender is a depository institution (commercial banks, bank holding companies, credit unions, thrifts) or is owned by one. For example, loans made

[24]We thank our discussants Greg Buchak and Sergey Cherenko for highlighting this point.

[25]The secured party identifier provided by the data vendor does not accurately account for subsidiaries, spelling errors in names, etc. while aggregating. We therefore rely on manual name cleaning.

by Wells Fargo Bank and loans made by Wells Fargo Leasing are classified as bank loans made by Wells Fargo. We classify finance companies based on their name and information on their website. We further use this information to distinguish between captive finance companies and independent finance companies. As discussed in more detail below, we classify FinTech lenders based on information on their website or whether they use a UCC filing service.

For smaller lenders, we use patterns in names to complete the classification (for example, the occurrence of the terms "bank" or "credit union" vs. "leasing" or "financial services"). The remainder of the sample is mostly very small lenders. Upon inspection, these loans are found to belong mostly to non-financial businesses. One way in which non-financial businesses have outstanding UCC liens is through the extension of trade credit.

We conducted an extensive analysis to compare our dataset to data obtained from state-level UCC filings, some of which can be accessed online and downloaded in bulk. Specifically, we collected the universe of UCC filings for Texas covering the entire time period. We also collected the universe of UCC filings for California from 2011 to 2015. At the ZIP code-year level, the number of loans in our sample has a 91.6% correlation with state-level data from Texas and California. Our understanding is that the difference between our data and the state-level datasets arise because the state-level data has some observations with missing data that are dropped by the commercial data vendor. We find that the correlation is almost identical when focusing only on loans made by banks, finance companies, or FinTech Lenders.

We find that 186,500 loans (1.64% of the sample) are made by "UCC filing agencies." UCC filing agencies are private companies (for example, Corporation Service Company) that do not lend to firms but make filings on behalf of lenders. An important benefit of using a filing agency is that the lender can conceal his identity. Discussions with industry experts suggest that these services are largely used by MCA companies, and we classify these loans as such.[26] As discussed above, MCA lenders are FinTech lenders that primarily make short term loans.[27] Our main qualitative results do not vary with the exclusion of these loans.

[26]MCA companies are particularly incentivized to hide their identity due to the infamous industry practice of "loan stacking," whereby a loan or cash advance is approved on top of a loan or advance that is already in place with similar characteristics and payback terms. The marketing brochure of Corporate Service Company, the largest UCC filing service agency, states that *"By [filing a UCC], the lender effectively puts its customer list into the public record for competitors to see. In certain lending markets, especially merchant cash advance, factoring and other nonbank business lending, competitors will use this information to target the customers of particular lenders."*

[27]To verify whether loans filed under UCC filing agencies are originated by MCA companies, we focus on the collateral pledged. MCA companies often require blanket liens on firm assets or personal guarantees to provide cash advances. Roughly 80% of the loans filed under the UCC filing agencies have blanket liens or a lien on business accounts and accounts receivables. In contrast, only 15% of the loans in the full sample have similar collateral. This provides additional suggestive evidence that the loans underlying UCC agency filings are issued by MCA companies.

I.2.2 UCC data coverage

This section computes the data coverage of the UCC data as a share of total small business lending. We use non UCC-data sources such that the estimation can be verified with publicly available data sources. Our best estimate is that we cover 73% of the total small business lending.

Secured, non-real estate lending. The UCC data covers all secured, non-real estate lending. The main lenders are commercial banks, finance companies and FinTech lenders. We estimate that small business lending by lender type from aggregate non-UCC sources:

- *Bank lending.* We compute business loans from US bank call reports. Small business loans are the sum of commercial and industrial loans to US addressees in domestic offices with original amounts of $100,000 or less (rcon5571), loans with original amounts of more than $100,000 through $250,000 (rcon5573), and loans with original amounts of more than $250,000 through $1,000,000 (rcon5575). We find that total outstanding small business loans issued by commercial banks are $298.3bn in 2016.

- *Finance companies lending.* We collect finance company lending from aggregate data from the Federal Reserve Board data. Total business loans outstanding at finance companies are $388bn in 2016.[28] The Fed data does not break out small business loans, but it is our understanding that the vast majority of finance company loans are provided to small businesses.

- *FinTech lending.* We estimate data on FinTech lenders from trade publications. FinTech lenders tend to make smaller loans. We focus on Merchant Cash Advance lenders since they represent the vast majority of secured loans by FinTech lenders. Industry reports estimate FinTech lending to be around $12.8bn in 2016.[29]

We use the UCC data to verify that our aggregate data sources capture lending to small businesses. To do so, we match UCC loan data to Dun and Bradstreet data on firm size. We define a firm as small if it has less than 500 employees, consistent with the SBA's definition of small firm. We find that 96% of bank loans, 93% of finance company loans, and 99% of FinTech loans are made to small businesses. This shows that we are indeed capturing small business loans.[30]

Summing up, total small business lending covered by our dataset in 2016 is $699.1bn.

[28] See https://www.federalreserve.gov/releases/g20/20201214/

[29] https://bryantparkcapital.com/wp-content/uploads/2018/06/BPC-MCA-SMB-Financing-Industry-Report.pdf

[30] We follow the convention in the literature of using small loans for the empirical analysis.

Next, we estimate small business lending not covered by the UCC data, i.e., total unsecured lending and total real-estate lending to small businesses.

Let us start by acknowledging that there is limited data on the size of unsecured credit and real-estate lending to small businesses. Hence, there is scope for more research since these data have to be collected from non-standard data sources.

Unsecured lending. The conventional wisdom in the small business lending literature is that the vast majority of small business lending is secured.[31] Recent work by economists at the NY Federal Reserve confirms this view.

Luck and Santos (2019) use confidential regulatory data collected from the largest 29 commercial banks, the FR Y-14Q data, to evaluate the extent of secured versus unsecured lending. They find that 84% of all firm lending is secured and that 96% of small firm lending is secured (see Table 1 of Luck and Santos (2019)). They find that: *"Firms with less than 50 million dollar in assets, for instance, essentially never borrow unsecured (3.6% of their loans are unsecured) (page 7)."*

A possible caveat to these estimates is that the FR Y-14Q data does not include credit card borrowing. Credit cards are a convenient way for small firms to borrow unsecured. The Federal Reserve Board (2010) issued a special report to Congress titled "Report to the Congress on the Use of Credit Cards by Small Businesses and the Credit Card Market for Small Businesses." The report finds that 83% of small businesses use credit cards, but only 24% borrow on them. Importantly, aggregate credit card borrowing is small at 1.4% of total borrowing. *"In the aggregate, credit card debt represents a very small percentage of total debt held by small business owners to finance their business operations. ... credit card debt accounted* ***for just 1.4 percent of all debt*** *held by small businesses..."*.

Using different data, we confirm the Federal Reserve estimate of credit card borrowing using data from a recent paper in the *Quarterly Journal of Economics*. Agarwal, Chomsisengphet, Mahoney, and Stroebel (2014) report data on all business credit cards issued by the largest nine credit card issuers. The paper reports a total of seven million business credit cards with an average outstanding balance of $1,900. This amounts to total borrowing of $13.3bn. Given our estimate of small business lending of $957.7bn (see below), this amounts to credit card borrowing of 1.39%.

We note that some unsecured lending is captured in our data. FinTech loans are usually

[31] For example, Mann (1997) conducts a survey on the role of secured credit in small business lending. He starts the survey as follows: *"If you asked the average commercial law academic what kind of businesses use secured credit, you would probably would be told that larger firms generally use unsecured credit and smaller firms generally use secured credit."* In a similar vein, Berger and Udell (1995) argue that most small business lending is collateralized. They state that *"Collateral is widely used in small business lending. For example, the majority of small business lines of credit are secured."*

advertised as being unsecured. The literature of refers to lending as unsecured if there is no specific piece of collateral pledged against it. However, FinTech lenders often require a blanket lien, which does not require a specific piece of collateral but is captured in the UCC data.[32]

To be conservative, we add the unsecured borrowing Luck and Santos (2019) estimate of 3.6% and the Fed report card borrowing estimate of 1.4%. This yields an estimate of total unsecured lending of about **5%** of total small business lending.

Real-estate lending. Real-estate lending is not covered by the UCC data. The reason is that, historically, mortgages have been recorded in local deeds registries. As a result, mortgages are not registered with state-level UCC registries.

Luck and Santos (2019) use FR Y-14Q data to estimate the share of small business lending secured by real estate. They find that 22% of all small business lending is secured (see Table 1).

A separate survey by the National Federation of Independent Business arrives at a similar estimate. The survey finds that between 13% to 22% of firms borrow against business real estate in the years 2008 to 2011.

We cross-check our estimate with data on real estate holdings. Firms can only pledge real estate if they own real estate. The Federal Reserve Small Business Credit Survey (2020) finds that only 19% of firms own their business headquarters. The survey is restricted to employer firms, i.e., firms that have at least one salaried employee. Small businesses also include non-employer firms, which tend to be smaller and are less likely to own real estate. Hence, at most 19% can pledge any real estimate. This estimate provides further support for the estimate by Luck and Santos (2019).

In sum, we estimate that real estate lending is around 22% of total small business lending. To be conservative, we go with the highest number, which suggests that 22% of total small business lending is secured by real estate.

UCC data coverage. To summarize, the UCC data covers all secured, non-real estate lending. We estimate that around 5% of small business lending is unsecured and around 22% of small business lending is backed by real estate. Hence, it follows that the UCC data covers a total of 73% of small business lending. Our estimate of the total small business lending market is \$699.1bn/0.73=\$957.7bn.

[32]Merchant Cash Advance lending is advertised as unsecured. Here is an excerpt from a typical website describing MCA loans: "Most merchant cash advances are unsecured loans, meaning no tangible asset is pledged against the money." See https://www.originalfunding.com/news/merchant-cash-advances-mca-everything-you-need-to-know.

Comparison to other data sources. The Internet Appendix I.2.3 provides a detailed comparison of the UCC data with commonly used data sources such as bank lending data from CRA, the SBA, and the syndicated lending data. We believe the UCC data is complimentary to the CRA data with the advantage of providing loan-level data on both bank and nonbank operations.

A recent study by the FDIC found that the exclusion of small banks is important because small banks are the ones that focus their lending on small businesses. This is consistent with a large literature in small business lending, which argues that small firms typically borrow from small banks (e.g., Stein, Berger, Miller, Petersen, and Rajan (2002), 2002).

I.2.3 Comparison of UCC data to other data sources

CRA data

The most commonly used data on small business lending is the data collected under the Community Reinvestment Act (henceforth, CRA data). While there is an overlap between the UCC data and the CRA data, there are also significant differences that are important for interpreting our results. We briefly review the main differences.

First, our data covers banks, finance companies, FinTech lenders, and other nonbank lenders. The CRA data only covers lending by banks whose assets exceed $1 billion. Hence, our data covers lenders (small banks and nonbanks) that are not included in the CRA data.

Second, the CRA data is collected under the Community Reinvestment Act and is used to compute a bank's CRA rating. The CRA rating affects whether regulators approve proposed mergers and acquisitions. Hence, banks have incentives to report lending in certain ways, and there is anecdotal evidence that banks adjust their reported lending accordingly.[33] Hence, reporting incentives may affect the quality of the CRA data when used to measure new credit. In contrast, our data is collected from UCC filings. Lenders make UCC filings to preserve priority in bankruptcy and have strong incentives to report correctly.

Third, the CRA data includes both secured and unsecured credit. By definition, UCC filings only cover secured credit. This means our analysis does not cover unsecured credit to businesses. Our understanding is that the main source of unsecured credit is credit cards issued to small businesses. For business credit cards, the CRA calculates the loan amount as the total credit limit.[34]

[33]See, for example, https://www.wsj.com/articles/never-mind-the-ferrari-showroom-bank-regulators-say-this-a-poor-neighborhood-1495108800.

[34]As of 2013, there were 28.3 million business cards. For more information, see the 2013 Federal Reserve Payments Study, which can be found at https://www.frbservices.org/assets/news/research/2013-fed-res-paymt-study-detailed-rpt.pdf.

Fourth, the CRA data reports changes in credit limits as new lending even if the change does not result in lending.[35] This applies to both credit lines and credit cards. It is our understanding that such changes in credit limits are important when interpreting CRA data. UCC data does not include changes in credit limits. Moreover, CRA data counts loan refinancing as new loan originations, while the UCC filings do not. Hence, there is a concern that the CRA may overstate changes in new lending.

Fifth, the UCC data has no size cutoff. The CRA data only includes commercial and industrial loans (C&I loans) of less than $1 million. The Government Accountability Office (GAO) has pointed out that the $1 million cutoff (which has remained unchanged since 1992) leads to mismeasurement of lending to small businesses.[36]

Sixth, CRA data are collected at a higher level of aggregation than UCC data and cannot be matched to firm-level data. CRA is collected at the bank-county level. The UCC data is collected at the loan-level and contains information on the exact borrower. The UCC also collects information on the underlying collateral.

Seventh, neither CRA nor UCC contain data on individual loan amounts. In the CRA data, average loan amounts can be estimated based on total lending volume and loans counts at the bank-county level. In the UCC data, loan amounts can be estimated based on the underlying collateral (e.g., lending for new construction equipment is usually provided for the full amount.)

Overall, we see the two datasets are complementary. The UCC has detailed loan-level data and collateral information that can be matched at the firm-level. It covers both banks and nonbanks but does not include unsecured loans. CRA data includes unsecured lending. However, CRA cannot be matched at the firm-level, has no information on collateral and larger loans, does not cover nonbank lenders or small banks, does not include larger loans and counts increases in credit limits as new loan origination. Both datasets may suffer from potential reporting biases. At a minimum, our data provides a way to assess the validity of the widely used CRA data.[37] Moreover, it can be used to analyze dimensions of small business lending that are not covered by the CRA data (e.g., lending by finance companies, collateral, firm-level characteristics such as industry).

[35] The CRA guidelines explicitly ask banks to report such changes. *"Lines of credit are considered originated at the time the line is approved or increased; and an increase is considered a new origination. Generally, the full amount of the credit line is the amount that is considered originated. In the case of an increase to an existing line, the amount of the increase is the amount that is considered originated and that amount should be reported."* For more information, see the guidelines at https://www.ffiec.gov/cra/pdf/2015_CRA_Guide.pdf

[36] https://www.gao.gov/reports/GAO-18-312/

[37] As discussed above, we show that the UCC data can be used to replicate the shift in lending from Top4 banks to non-Top4 as documented by Chen, Hanson, and Stein (2017) using the CRA data.

Share of small business lending covered in the CRA data. Next, we focus on data coverage of the CRA data relative to the UCC data. Contrary to the UCC data, the CRA data includes real-estate lending and unsecured lending by large banks. However, the CRA does not include lending by small bank and nonbank lending.

We know from our discussion in Section III.B that small business lending by banks (measured from bank call reports) is $298.3bn. We note that CRA data only includes large banks, i.e., banks with more than $1.226 billion in assets. By excluding small banks from the CRA data, the CRA data does not capture $67bn of small business lending by small banks. In addition, the CRA data does not capture lending by credit unions. In 2016, credit unions held $61.8bn in business loans.[38] Thus, total small business loans outstanding at banks and credit unions in 2016 was $360.1 bn. Of this, the CRA data captures $231bn, or 64.1% of small business lending.[39]

By construction, our call report estimate does not include real estate lending. We need to estimate the share of real-estate lending done by banks relative to nonbanks because the CRA data only captures real estate lending by banks. Recent work on residential mortgages suggests that nonbank lenders provide more than 50% of total mortgages. Our best estimate of the share of commercial real estate lending provided by banks is around 50–55%.[40] Hence, to be conservative we estimate that banks provide 55% of real estate lending. We thus estimate that banks provided commercial real estate lending of 55% $\times$ 22% $\times$ $957.7bn = $115.9bn.

To summarize, the CRA data does not cover the following types of small business lending:

- CRA dates not capture nonbank lending. Nonbank lenders account for 56% of secured, non-real estate lending and 45% of real-estate business lending.
- CRA data does not capture small bank and credit union lending, accounting for 35.6% of small business lending.

This yields total bank lending reported by CRA of $298.3 + 116.1bn = $414.3bn. Our estimate of total small business lending is $957.7bn. Hence, we estimate that CRA covers around 43% of total small business lending. For comparison, the CRA data coverage is 30 pp lower than the UCC data coverage.

[38] https://www.federalreserve.gov/publications/2017-september-availability-of-credit-to-small-businesses.htm

[39] From the June 2016 Call Report, we note that the total loan volume outstanding with initial amount <$1 million =$298 billion. Total loan volume outstanding with initial amount <$1 million at banks with >$1.226 billion in total assets (CRA reporting banks in 2016) = $231 billion. Thus, share of lending by reporting banks = 77.5%.

[40] https://www.spglobal.com/marketintelligence/en/news-insights/blog/commercial-real-estate-sector-continues-strong-performance-but-how-much-better-can-it-get

SBA data

Several papers use the Small Business Lending Administration (SBA) data. These papers analyze the market for government-guaranteed SBA loans. Obviously, firms that are approved for SBA loans are not representative of the overall small business lending market. These firms tend to be smaller, younger, less creditworthy and satisfy certain criteria set out by the SBA. According to SBA Agency financial report, total SBA loans outstanding in 2016 are $78 billion. Hence, using our estimate from above, we estimate that SBA covers 8% of total small business lending.

Syndicated loan data

Another commonly used data source on business lending comes from DealScan. DealScan covers syndicated lending to large businesses. The average size of a syndicated loan in 2016 was $417 million. Syndicated loan borrowers are large firms with average annual sales of $9 billion in 2016. While syndicated lending is covered by our data, it only constitutes a small fraction of the *number* of loans. In 2016, there were about 4,300 syndicated loans made to 2,400 companies. For comparison, there were 1.25 million loans made to over 790,000 firms in the UCC data. Syndicated loans account for less than 0.35% of the UCC data.

Other data

A few papers use hand-collected to shed light on certain types of borrowers or lenders. A very nice example is Chernenko, Erel, and Prilmeier (2019). Chernenko, Erel, and Prilmeier (2019) document the importance of nonbanks for middle market firms. The analysis is based on 750 publicly-traded US-based middle market firms that appear in Compustat at least once during the 2010–2015 period. The average nonbank borrower in their sample borrows $74 million, and the average bank borrower, $185 million. We believe this is an important contribution to the literature because mid-sized firms are often ignored when analyzing business lending. However, our paper provides a complimentary study focused on small business lending.

I.2.4 Nonbank lending growth trends

We recognize that our paper does not cover unsecured lending and real-estate lending. If these types of lending experienced significantly more bank lending after the 2008 financial crisis, it might somehow offset the rise of nonbank lenders documented in this paper. However,

we believe this is is unlikely.

First, lending not covered by UCC data only represents 27% of total small business lending. Hence, we would need to see a very large shift in bank lending within these categories to offset the rise in nonbank lending documented in our paper. As discussed below, the empirical evidence suggest that, if anything, banks reduced their lending in these areas as well.

Second, the CRA data provides prima-facie evidence that banks did not significantly expand real-estate and unsecured lending. As mentioned above, the CRA covers real estate and unsecured lending by banks. As discussed in the introduction, the literature has found that CRA lending dropped by 31% between 2006 and 2014 (Chen, Hanson, and Stein (2017)). This drop in bank lending is even larger than the one documented in the UCC data. This suggests that the drop in unsecured and real-estate bank lending is even larger than the one in secured, non-real estate lending. In other words, the comparison of bank lending in the UCC data and CRA data shows that banks did not increase real-estate and unsecured lending to somehow offset the rise in nonbank lending.

Third, we can directly analyze real-estate lending, which is the main type of lending not covered by the UCC data. Luck and Santos (2019) show that real-estate lending slightly declined after the 2008 financial crisis. Figure 1 shows the share of small business lending against real estate lending dropped from 26% to 18% (reported here in Figure I.2).

Fourth, unsecured lending also shifted to nonbanks since 2008. As documented in our paper, Merchant Cash Advance lenders made significant inroads in this market, lending around $10.8bn by 2016. Hence, we think it is highly unlikely that there was an increase in the share of bank lending in unsecured credit. In any case, this market is quantitatively small and unlikely to affect our results.

To summarize, we are confident that our result on the rise of nonbanks is robust to including data on small business lending not covered by the UCC data. The main reason is because we are already covering the vast majority of the small business market. Moreover, we can use CRA data to rule out that banks expanded lending not covered by UCC data. Other data sources further suggest that real-estate lending and unsecured lending experienced a rise, rather than a decline, in nonbank lending.

I.2.5 Loan size

The UCC data does not include loan size. The issue is that we observe whether collateral was pledged against a loan but that we do not observe the loan amount associated with the loan. We therefore present result analyzing the extensive margin of lending (i.e., number of

loans and whether a loan was granted). We think this approach is sensible in our setting because we deal with small business loans. By the nature of the business, these loans tend to be small and loan volume is highly correlated with the number of loans.

We can test this assumption using the CRA data since the CRA data contains both the number of loans and total loan amount. We examine both the time-series and the panel dimension to assess whether the number of loans is a good proxy for total loan volume.

First, we analyze the time-series of CRA lending. Figure I.3 plots the annual number of loans and total loan volume from 1996 to 2016. It is clear from the figure that the two series move very closely together. The correlation is high at 91.2%

Second, we find similar results when analyzing the panel dimension of CRA lending. Specifically, we focus on the most disaggregated available data, which is at the bank-county level. Panel A of Figure I.4 plots a binned scatter plot between the log number of loans and log loan volume per bank-county-year. It is clear that there is a very close relationship. The correlation is 80.0%. Panels B, C, and D plot the same relationship conditional on time fixed effects, time and bank fixed effects, and time, bank, and county fixed effects, respectively. Again, the correlation is high at 80.3%, 89.9%, and 90.2% respectively.

As an alternative data check, we can also use the EDA data. As discussed in the paper, the EDA data provides loan size for around a third of the UCC data. The EDA data derives loan size from data on collateral with collateral-specific identifiers (e.g., truck, construction equipment, etc.). The EDA is put together by data provider Randell-Reilley and is widely used among equipment manufacturers.

Panel A of Figure I.5 plots aggregate annual loan volume and the number of loans from the EDA data from 1990 to 2016. We find that the number of loans and loan volume move closely together. The correlation is 95.3%.

Finally, Panel B of Figure I.5 exploits the panel structure of EDA data. We examine lending at the county level by plotting a binned scatter plot between the log number of loans and log loan volume per county-year, including county and year fixed effects. We, once again, find a high correlation of 97%.

In short, we find a very tight relationship between the number of loans and loan volumes using two different datasets on small business lending. Given this evidence, we believe it is sensible to examine the number of loans in the context of small business lending.

I.2.6 Loan spread

The UCC data does not include information on interest rates. While it would be preferable to have this information, we note that this restriction applies to most work in this literature,

including almost all work on US small business lending. Like the UCC data, the CRA dates does not have interest rate information. More generally, most work using loan-level data only analyzes loans amount and not interest rates. The reason is that almost loan-level data comes from public credit registries, which rarely collect information on interest rates. Hence, the vast majority of papers in the credit registry literature do not analyze loan-level interest rate data, including many well-known papers such as, for example, Khwaja and Mian (2008), Schnabl (2012b), Jimenez, Ongena, Peydro, and Saurina (2014), and Blattner, Farinha, and Rebelo (2020)

The Federal Reserve survey on Terms of Business Lending (STBL) collects data on interest rates by loan size. Panel A of Figure I.6 plots the average loan spread for small business loans with a loan size of less than $1 million from 2006 to 2016 from the Federal Reserve survey on Terms of Business Lending (STBL). We construct the loan spread by averaging the loan spread on loans of loan size of $100,000 and loans of loan size of $100,000 to $1 million. The figure shows that the loan spread increased from 3.1% at the start of the 2008 financial crisis to a peak of 4.3% in 2010. The loan spread gradually declines thereafter back to the pre-crisis level of 3.3% in 2016.

Panel B of Figure I.6 shows that bank lending is the mirror image of the interest rate spread. Bank lending declines from 2008 to 2010 and then slowly recovers. Hence, we observe an increase in the price (loan spread) and a decrease in the quantity (lending). The fact that price and quantity move in opposite directions is evidence of a negative supply shock, i.e., an inward shift in the supply curve and a movement along the demand curve.

To summarize, we think the aggregate time series on bank lending and bank interest rates suggest that there was a negative bank credit supply shocks in the immediate aftermath of the 2008 financial crisis that was eventually offset by nonbank lenders.

Figure I.2: Small Business Collateral

This figure is taken from Luck and Santos (2020) and plots the share of different collateral types pledged by small businesses between 2012Q3 and 2019Q3.

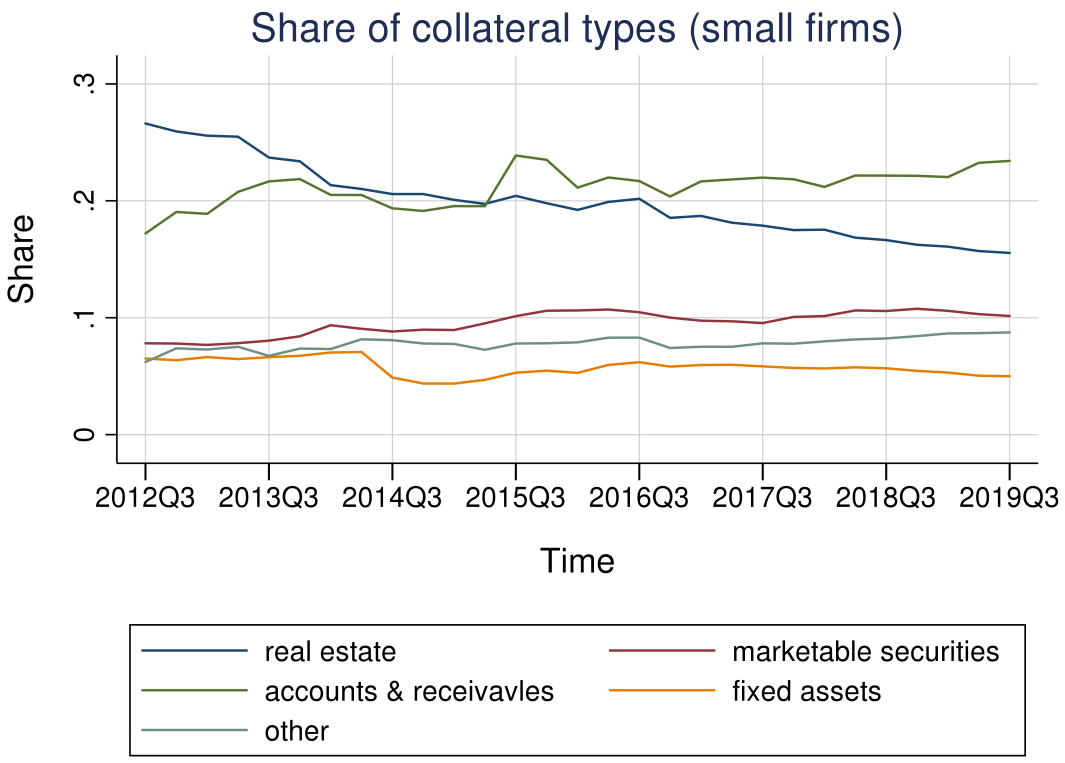


Figure I.3: Correlation between loan number and volume - CRA data

This figure plots the correlation between the aggregate number of loans and total volume of small business loans, as measured in the Community Reinvestment Act (CRA) data. The sample period is from 1996–2016 and includes all reporting banks.

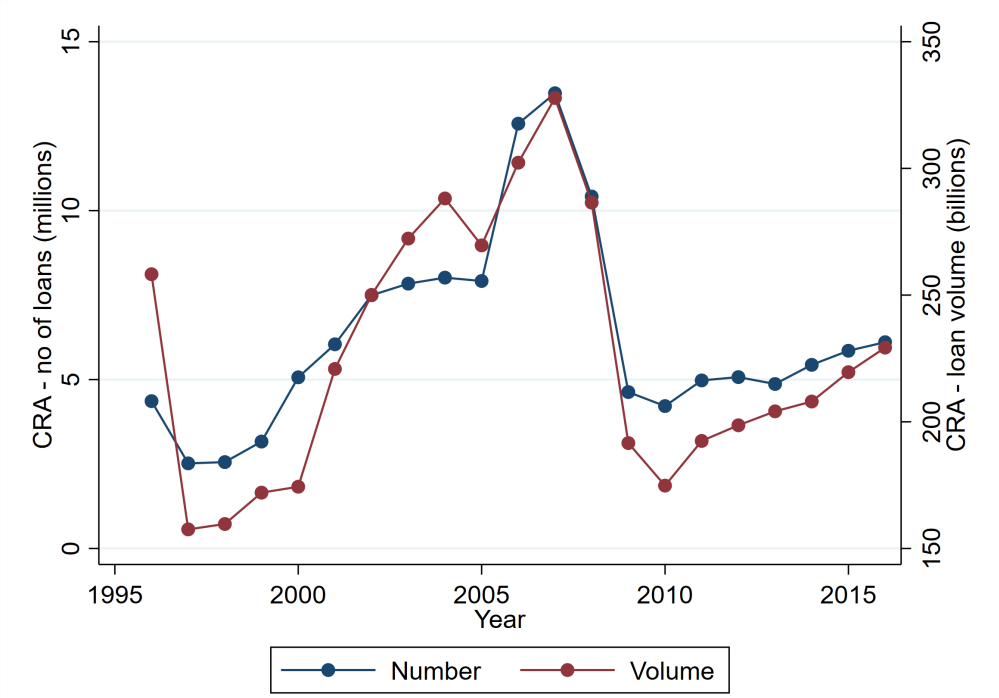


Figure I.4: Correlation between loan number and volume: Binned scatter plots of CRA data

This figure plots the correlation between the number and volume of small business loans, as measured in the Community Reinvestment Act (CRA) data. The sample period is from 1996–2016 and includes all reporting banks. Panels A and B collapse observations at the county-year level. Observations in Panel C and D are at the bank-county-year level. Binned scatter plots are plotted after including fixed effects, as noted below each figure.

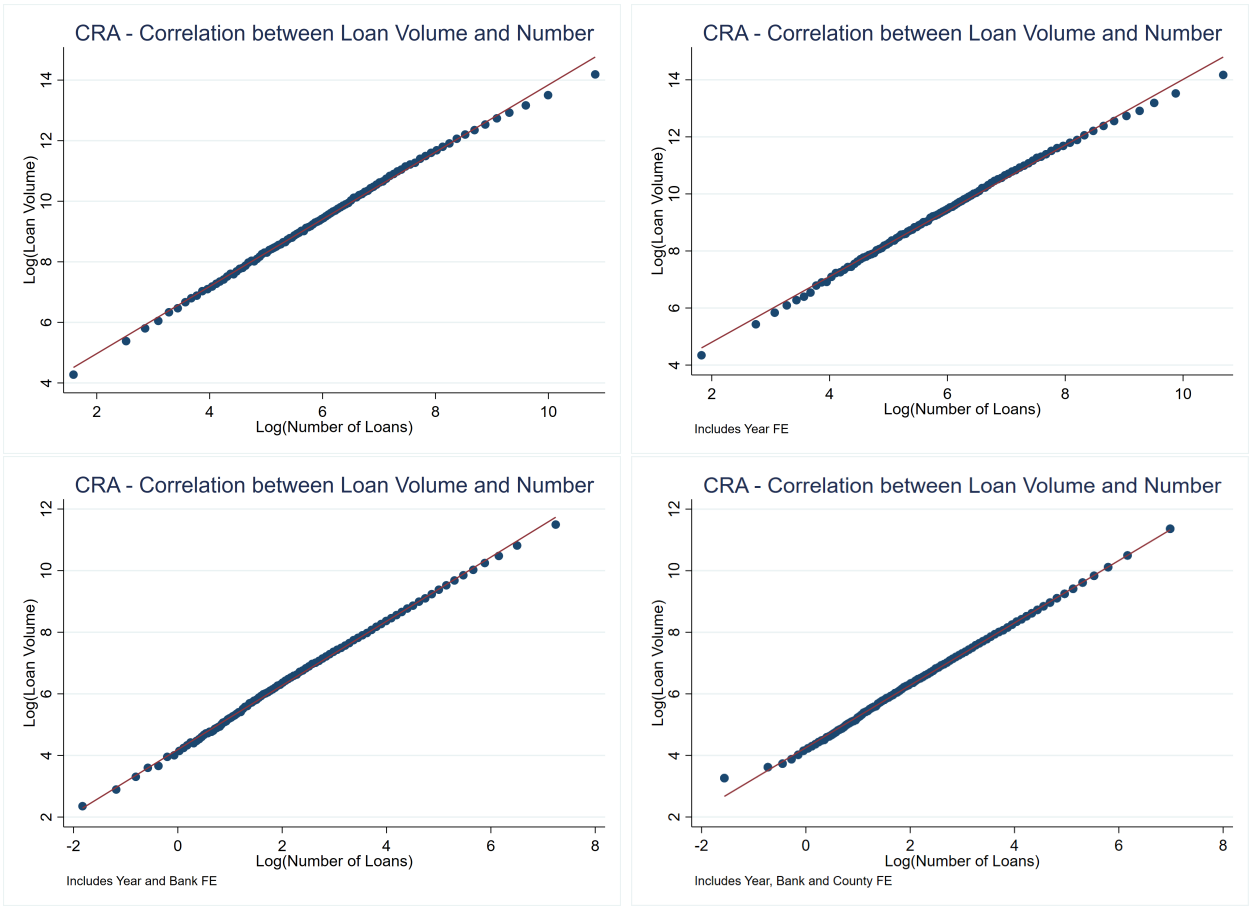
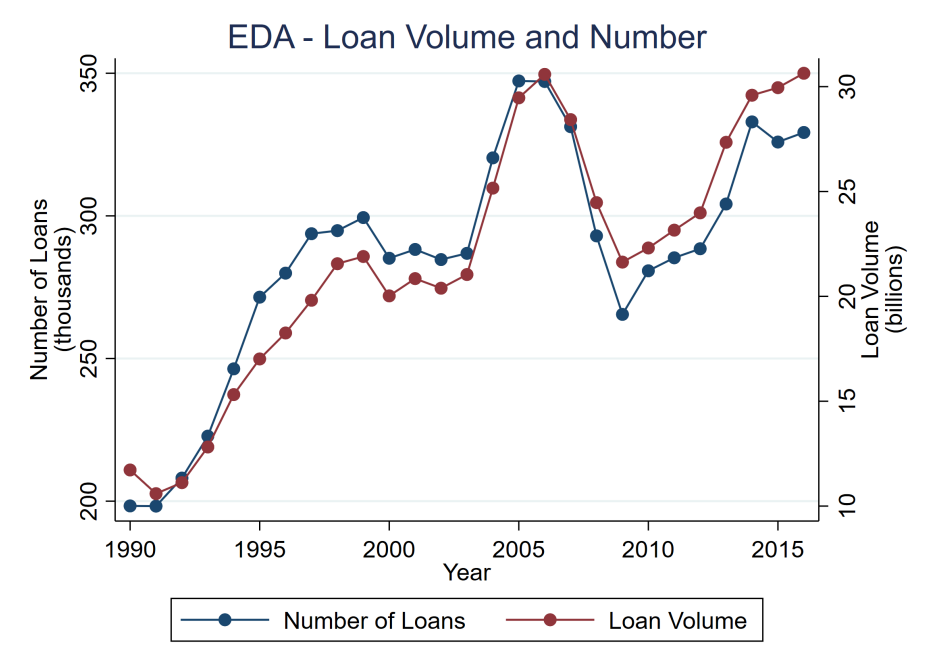


Figure I.5: Correlation between loan number and volume - EDA data

This figure plots the correlation between the number and volume of equipment loans in the EDA data. The sample period is from 1990–2016 and includes all reporting lenders. Panel A plots the aggregate time-series of the number and volume of new loan issuances. Panel B presents a binned scatter plot of loan volume against number of loans. Observations are at the county-year level and correlations are plotted after absorbing county and year fixed effects.



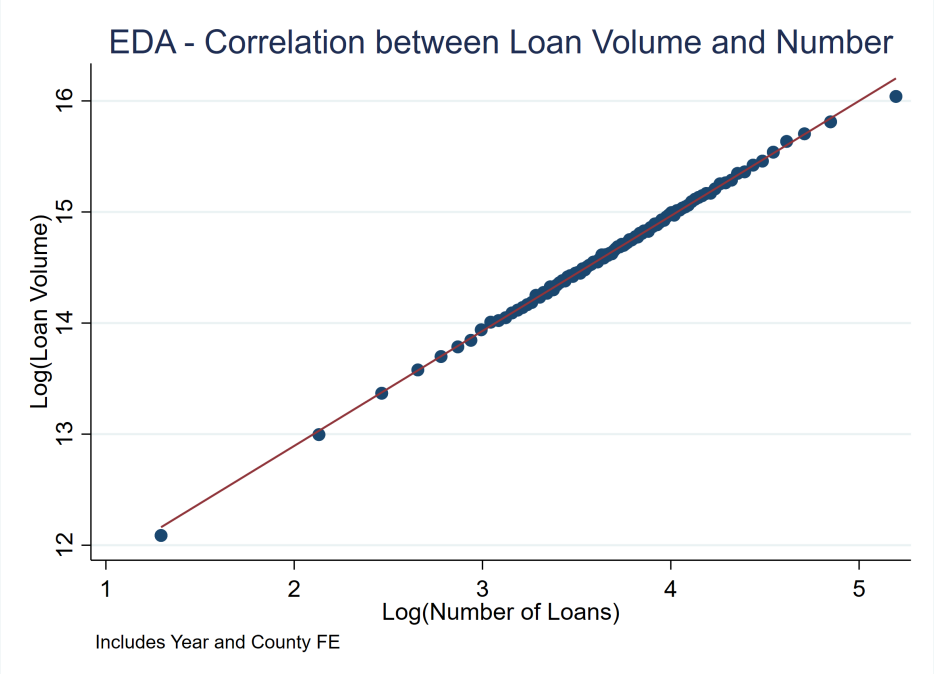
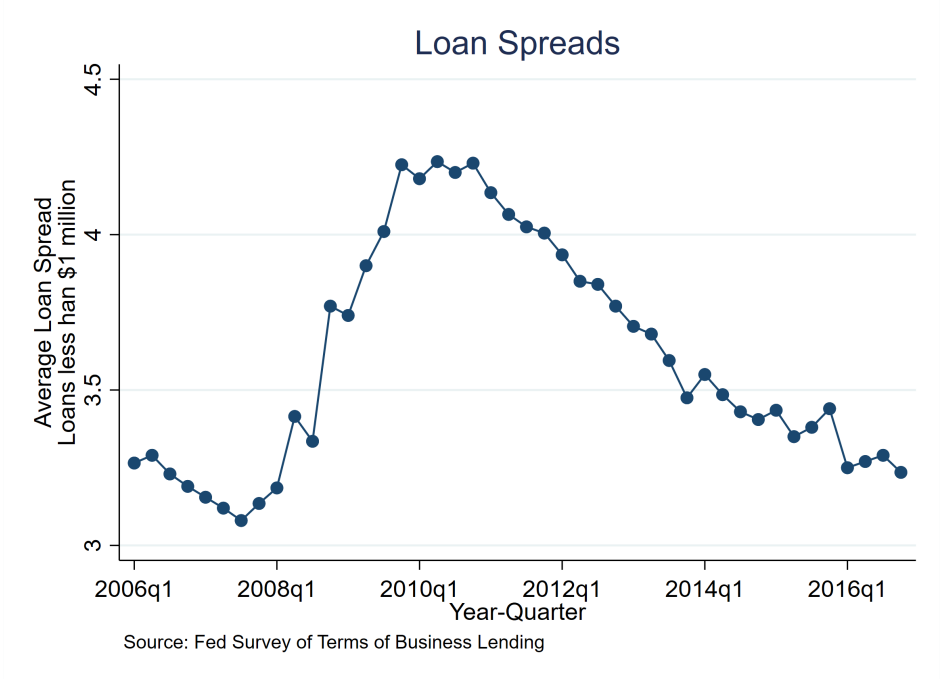


Figure I.6: Loan Terms

Panel A plots the average loan spread on commercial and industrial bank loans of less than $1 million as reported by the Federal Reserve Survey on Terms of Business Lending (STBL). The sample is from 2006 to 2016 and is reported at the quarterly level. Panel B plots the number of bank loans as measured in the UCC data and replicates Figure 1 in the paper.

Panel A: Loan Prices



Panel B: Number of Loans