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Minnis, Michael and Sutherland, Andrew and Vetter, Felix

University of Chicago, MIT, University of Mannheim

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Michael Minnis

University of Chicago Booth School of Business

Andrew G. Sutherland

MIT Sloan School of Management

Felix W. Vetter

University of Mannheim

March 2023

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Abstract

Using a dataset covering 3 million commercial borrower financial statements, we document a substantial, nearly monotonic decline in banks' use of attested financial statements (AFS) in lending over the past two decades. Two market forces help explain this trend. First, technological advances provide lenders with access to a growing array of borrower information sources that can substitute for AFS. Second, banks are increasingly competing with nonbank lenders that rely less on AFS in screening and monitoring. Our results illustrate a novel implication of positive accounting theory: technology adoption and changes in credit market structure can render AFS less efficient for screening and monitoring, and reduce lenders' demand for them.

JEL Classification: G21, G23, M41, M42, D82, G30, O31

Keywords: banks, lending standards, financial statements, auditing, SME lending, nonbank lending, fintech.

1 Introduction

“In general, of course, it will pay the owner-manager to engage in bonding activities and to write contracts which allow monitoring as long as the marginal benefits of each are greater than their marginal cost” (Jensen and Meckling 1976).

Positive accounting research argues that attested financial statements (henceforth AFS) emerge in markets not only because of regulation, but also because they provide an efficient method for capital suppliers to monitor managers (Watts 1977; Watts and Zimmerman 1983; Kothari, Ramanna, and Skinner 2010; Ball 2022). An implication of this is that innovations in information sources can reduce demand for AFS in markets where they are not required to be produced. Similarly, if lenders differ in their screening and monitoring reliance on AFS (e.g., Berger, Minnis, and Sutherland 2017), and the mix of lenders in the economy changes, borrowers may face less demand for AFS.

Evidence on such developments is important to understanding both the future of CPA services and how firms access credit. In this paper, we examine recent technological advances and credit market structure changes in the small and medium enterprise (SME) lending market, to understand the implications for AFS demand in a market where reporting and auditing is voluntary.

We begin by studying the propensity for U.S. banks to collect AFS as part of their screening and monitoring of SMEs between 2002 and 2017. We access data from the Risk Management Association (RMA) containing financial statement collection records of banks responsible for over half the U.S. commercial lending market. The data cover nearly 3 million business financial statements, categorized by financial statement type, bank, and borrower industry, location, and size. While prior studies examine cross-sectional variation in this data (e.g., Lisowsky, Minnis, and Sutherland 2017; Berger et al. 2017; Di and Pattison 2020), we focus on the time series. Figure 1 reports a striking descriptive finding: 57% of borrowers provided an unqualified audit, review, or compilation (i.e., AFS) to their bank in 2002, and this rate declines to just 33% in 2017.

This trend does not appear to be a simple manifestation of changes in the types of firms (e.g., Srivastava 2014) or banks in the data. Specifically, in subsequent figures we plot the year fixed effects from regressions modelling AFS collection after controlling for borrower characteristics (industry, location, and size) and bank fixed effects, and limiting the sample to banks sharing data with RMA every year. We find little change in the 2002-2017 AFS decline compared to Figure 1. We also find a similar decline when we focus exclusively on the proportion of statements that are unqualified audits. By contrast, AFS collection is static for governments and schools, which commonly face reporting mandates and therefore whose supply of AFS to banks is more inelastic. Together, this descriptive evidence suggests that the large AFS decline we find does not stem from mechanical issues or sample composition changes. We therefore turn to examining the hypothesis that changes in the lending marketplace play a role in explaining AFS collection declines.¹

Our focus on technology adoption and nonbank lending as relevant marketplace developments is motivated by three stylized facts. First, technological advances over the past two decades have transformed how lenders screen and monitor. For example, information sharing technologies have proliferated as the costs of gathering and verifying information have declined, leading to more comprehensive and timely credit reports (Djankov, McLeish, and Shleifer 2007; Liberti, Sturgess, and Sutherland 2022). Tellingly, PayNet, a leading U.S. credit bureau that has attracted eight of the ten largest lenders as members, advertises its credit score and credit report products using the slogan “Financial statements not required.”² Other vendors promote their

¹ We also find little evidence of securitization explaining the trend. The securitization market for SME loans is quite small, both compared to total SME lending and to other credit markets (e.g., mortgages or credit cards) (Wilcox 2011). Additionally, when the securitization markets froze during the financial crisis, our downward trend continued.

² According to its website, PayNet (acquired by Equifax in 2019) has the “largest proprietary database of small business loans, leases, and lines of credit in existence.”

products as helping lenders make approval decisions using alternative data or just financial statement components rather than complete, externally verified financial statements.³

Second and related, survey evidence indicates lenders are increasingly originating contracts based on credit scoring alone. Between 2017 and 2021, the percent of commercial credit managers stating that they are authorized to approve a loan for more than \$750,000 with only a borrower credit score has doubled (ELFA 2021). A majority of respondents report approving loans within their firm’s credit scoring threshold in one day or less—a timeframe that is difficult to achieve with a standard AFS analysis.

Third, nonbank lenders including captives, independent finance companies, and fintechs have grown considerably, and according to Gopal and Schnabl (2022) now provide the majority of U.S. small business loans. Whereas banks must demonstrate their credit standards to regulators, by, for example, collecting current financial statements and other documents from borrowers (Basel 2000; Minnis and Sutherland 2017; OCC 2020), nonbanks face no such oversight. Because AFS can be onerous to produce, competition between banks and nonbanks can influence the demand for AFS in credit markets.

Of course, documenting a role for technology adoption or nonbank lending in reducing AFS requires analyses that hold constant the overall state of the economy, accounting standards, and other factors that can independently affect AFS collection. For technology adoption, we examine how AFS demand responds to the evolution of the PayNet credit bureau, as measured by the share of lending in an industry-state-year by its lender members. Intuitively, as more lenders adopt a credit bureau technology, there should be less demand for AFS. A key advantage of this approach is that it permits us to study pertinent technology adoption in a granular way. To

³ To illustrate, Enigma helps lenders analyze a borrower’s credit card receipts and transaction volumes. Tax Status enables lenders to instantaneously pull a borrower’s complete tax return history from the IRS. Rutter allows lenders to fetch data from a borrower’s accounting platforms.

illustrate, the bureau provides information designed to substitute for AFS (hence the “financial statements not required” slogan). Additionally, bureau information coverage evolves sporadically because lenders join in a staggered pattern and lenders often specialize by sector or equipment type (hence, the technology shocks we study are not common to all industries or locations within a year). Controlling for state-year and industry fixed effects, we find the share of loans made by PayNet member lenders reduces AFS collection by banks.

For nonbank lending, we investigate the extent to which banks and nonbanks rely on AFS in lending, and how this is changing over time. Ideally, we would examine exogenous competition shocks stemming from random nonbank entry decisions, and study how banks’ AFS collection changes. However, market entry is endogenous. Instead, our approach involves studying changes in local CPA supply, and measuring changes in bank lending using nonbank lending as the counterfactual to control for local economic conditions and credit demand. Our assumption is that if AFS are more important to banks given their screening and monitoring approach, then bank credit should change more than nonbank credit when CPA supply shifts. To test this, we assemble a comprehensive dataset of Uniform Commercial Code (UCC) filings detailing nearly 12 million secured non-real estate business loans and leases since 1997. The dataset covers both bank and nonbank lenders, including captives like John Deere and Volvo, independent finance companies like GE Capital, and fintechs. We identify CPA firms using state license information (Vetter 2022).

In a generalized difference-in-differences specification controlling for local economic conditions and credit demand (county-year fixed effects), and separate trends for different lender types (lender type-year fixed effects), we find that the sensitivity of lending to the number of CPA firms is far greater for banks than nonbanks. Economically, a one standard deviation increase in CPA supply is associated with a 0.34 (0.60) standard deviation increase in bank originations (dollars of equipment financed by banks), versus just a 0.14 (0.20) standard deviation increase in

nonbank originations (dollars of equipment financed by nonbanks).⁴ Our results are unaffected if we instead study counties that become or emerge from being a CPA desert (i.e., having zero CPA firms), or if we introduce state-lender type-year fixed effects that flexibly account for how banks and nonbanks may respond differently to local economic conditions (e.g., Gopal and Schnabl 2022). These results are consistent with banks being more reliant than nonbanks on AFS when screening and monitoring.

We then link the finding that banks are more reliant on AFS historically to the trend of reduced AFS collection by showing that the sensitivity of bank and nonbank lending to the supply of CPAs changes over time. We divide the 2000-2019 period into four 5-year periods (2000-2004, 2005-2009, 2010-2014, and 2015-2019) and re-estimate our model on each. In line with Figure 1, the sensitivity of bank lending to CPA supply diminishes by more than two-thirds from the first to last period. Over the same timeframe, the difference between bank and nonbank sensitivity also declines, by roughly half. In other words, banks appear to be increasingly behaving like nonbanks with respect to their demand for AFS. One explanation in line with these findings and our Figure 1 evidence is that competition from nonbanks compels banks to adjust their reporting requirements (e.g., Bushman, Hendricks, and Williams 2016). Thus as nonbanks have gained market share, banks have responded by reducing requests for AFS, contributing to the downward trend we document.

Our final tests examine a supply-side development: regulation that increases the cost of rendering CPA services. Specifically, we examine peer review mandates affecting CPA firms that cater to nonpublic entities such as the private firms in our study. Recent work examines the staggered implementation of these mandates, and finds a decline in CPA firms (and thus, CPA

⁴ These figures refer to within-fixed effect standard deviations (e.g., deHaan 2021). For a typical county in our sample, a one standard deviation change in CPA supply represents 1.26 CPA firms.

service supply) (Vetter 2022). We show peer review mandates also reduce AFS collection by banks, indicating that CPA firm compliance costs are important to understanding changes in borrower reporting practices.

We make several contributions. First, we document an important descriptive fact: the use of AFS in the lending market is declining. While we investigate several candidate explanations for this trend, there are likely others which we think the literature should explore. For example, practitioners have asserted that changes in GAAP have reduced the usefulness of AFS for private firms, which have in turn opted to forgo unqualified audit opinions. As one CFO explains, “The growing trend toward more complex standards and disclosures under existing GAAP can be misleading or distracting to users of private company standards” (Financial Accounting Foundation 2011).

Second, we add to growing research on how technology is transforming accounting. Existing work focuses on how Artificial Intelligence, blockchain technology, and other tools interact with labor in audit firms (Law and Shen 2020; Ham et al. 2022). A common theme in this research and ours is that technology can reduce the demand for CPA services, which raises important questions about the future of the accounting profession.⁵ While we focus on information sharing technology and credit scores, recent work documents other forms of technology adoption that can plausibly substitute for AFS collection, and these other forms are worthy of additional research.⁶

⁵ See also discussions of the usefulness of accounting numbers (Lev and Gu 2016) and of accounting program enrollment declines (Gabbin, Irving, and Shifflett 2020).

⁶ Lenders are expanding the types of information they access, including digital footprints (Berg et al. 2020), social media (Lin, Prabhala, and Viswanathan 2013; Costello, Down, and Mehta 2020), and collateral surveillance (Sutherland 2020).

Third, our evidence also relates to accounting research studying the evolution of debt contracting over recent decades.⁷ Demerjian (2011) and Ball, Li, and Shivakumar (2015) link changes in accounting standards to fewer accounting-based covenants in syndicated loan contracts. To our knowledge, our emphasis on the role of technology and credit market structure is unique, as is our investigation of SME lending.

Finally, we contribute to work on how SMEs access credit markets (Allee and Yohn 2009; Minnis 2011; Cassar, Ittner, and Cavalluzzo 2015; Kausar, Shroff, and White 2016; Berger et al. 2017; Breuer, Hombach, and Müller 2017; Gallemore and Jacob 2020; Lisowsky and Minnis 2020; Badertscher et al. 2022; Witzgen 2022). Recent research documents an increasing role for nonbank lenders in serving SMEs (Ma, Murfin, and Pratt 2022; Gopal and Schnabl 2022; Howell et al. 2022). However, we have little empirical evidence on the extent to which these lenders use AFS. Our results indicate that nonbanks rely less than banks on AFS; however, competitive interactions between nonbank and bank lenders are important to understanding AFS changes over the past two decades.

2 Background

2.1 U.S. Privately Held Firms

Privately held firms in the U.S. do not face mandates stipulating the type of financial statements they produce or whether the statements have any level of CPA attestation. Therefore, this setting is useful for studying the market-based demand for and supply of AFS. Debt contracting is often viewed as a primary source of financial reporting demand from privately held firms (Berger and Udell 2006). Banks demand financial statements to assess the credit risk of a potential new borrower and monitor the ongoing risk and relationship of a current borrower.

⁷ Our paper also relates to contemporaneous work finding that financial development during the 20th century reduced the prevalence of secured debt (Benmelech, Kumar, and Rajan 2020).

Financial reporting is not costless, however, and banks compete in the lending market, including over the reporting and attestation requirements that accompany loans. In terms of AFS supply, CPA firms catering to privately held firms are affected by both securities regulation (DeFond and Lennox 2011; Duguay, Minnis, and Sutherland 2020) and audit mandates (Vetter 2022), which in turn affect their cost structure.

The empirical literature has uncovered considerable variation in when AFS are used in lending, driven by a host of borrower, bank, lending market, and macroeconomic factors.⁸ Our paper extends this literature by documenting a decline in AFS collection by banks in recent years, and linking this trend to several marketplace developments. In this section, we further discuss the setting and marketplace developments.

2.2 Research on AFS in Secured Lending

Several of our analyses investigate the role of AFS in secured commercial lending markets. In the event of borrower default, a lender's losses are limited by their claim on secured assets, or "collateral." Despite this protection, the presence of collateral creates incentives for the lender to monitor (Rajan and Winton 1995), including by collecting AFS. Collecting information about collateral can serve two purposes. First, collateral often loses value between when the loan is granted and when the borrower defaults. Fixed assets can depreciate, be absconded, sold, or pledged to another lender, or rendered obsolete. Inspecting, tracking, and appraising collateral informs the lender about the expected proceeds in default. In fact, the public collateral registries providing data for our study enable lenders to monitor the pledged status of borrowers' assets.

Second, assets pledged as collateral often play a central role in the borrower's business. Therefore, changes in collateral value are informative not only about the expected proceeds in

⁸ Among others, see Blackwell, Noland, and Winters (1998), Allee and Yohn (2009), Minnis (2011), Cassar et al. (2015), Lisowsky et al. (2017), Minnis and Sutherland (2017), Berger et al. (2017) and Minnis and Lisowsky (2020).

default, but also the borrower's ability to repay and the lender's optimal decision in liquidation or renegotiation. For example, if a borrower misses a payment, the lender must decide whether to grant an extension, renegotiate the loan, or declare the borrower in default and repossess the collateral. Therefore, post-origination, lenders collect borrower information to prepare for different repayment scenarios. This monitoring is useful to both banks and nonbanks: Rajan and Winton explain, "Although we call the monitoring lender a bank for simplicity, in practice it could be any financial institution" (p. 1115).

Theoretical discussions of accounting standards discuss how financial statements aid this monitoring. Watts (2003) explains:

In assessing a *potential loan*, lenders are interested in the likelihood the firm will have enough net assets to cover their loans. Future values of the firm and of net assets are generally not verifiable. Lenders, however, obtain verifiable lower bound measures of the current value of net assets and use those as inputs in the loan decision. Further, they use those lower bound measures during the life of the loan to *monitor* the borrower's ability to pay. Essentially the measures calculate the value of net assets assuming orderly liquidation (emphasis original).

Kothari, Ramanna, and Skinner (2010) argue that accounting standards should reflect how contracting parties, including lenders, use financial statements: "The inclusion of purchased goodwill on the balance sheet is problematic... goodwill effectively represents the rents available to economic activity, it is not a separate and salable asset, and so has little or no value as collateral for lenders" (p. 262). Kothari et al. conclude that asset recognition criteria in part reflect the pledgability of different asset types and the usefulness of financial statements in monitoring them. In sum, theoretical research illustrates lenders' incentives to monitor borrowers with secured loans, and how financial statements facilitate this monitoring.

2.3 Institutional Evidence on AFS in Secured Lending

Lenders rely on AFS in a manner consistent with theory summarized in the prior section. GE Capital, one of the five largest lenders through much of our sample period, provides the

following guidance in their credit handbook: “A lender customarily confirms financial and collateral information provided by the borrower in order to support ongoing loan requests... by keeping track of the type and quality of collateral in the borrowing base, a lender can make available to the borrower the largest possible loan which can be supported by the collateral” (GE Capital Commercial Finance 1999). A popular equipment finance textbook (Contino 1996) further explains:

Lessors sometimes monitor a lessee’s financial condition during the lease by requiring that the lessee *periodically* submit financial reports, such as current balance sheets and profit and loss statements. With these, lessors can often spot potential financial problems and take whatever *early action* may be necessary to protect their investment... in some transactions, *the reporting requirement may be burdensome, and if so, it should be reduced or eliminated.* (emphasis added).

2.4 The U.S. Secured Commercial Lending Market

Our cross-sectional tests study the U.S. secured commercial lending market, where borrowers access credit for agricultural, construction, logging, manufacturing, medical, office, transportation, and other equipment. According to Gopal and Schnabl (2022), annual originations in this market average \$700 billion in recent years, representing over 70% of all small business lending. Contracts can be organized into two broad categories: leases (where the lender retains ownership of the equipment and agrees to rent it to the borrower for a specified period) and loans (where the borrower obtains legal ownership of the equipment after making all contractually required payments). Loans and leases also differ in the services provided by the lender (Contino 1996; Murfin and Pratt 2015) and their tax, bankruptcy, and financial reporting treatment (FASB 2016). Screening and monitoring efforts are quite important for both contract types, as lenders tend to retain the equipment finance contracts they originate.⁹ (Securitization volumes for equipment

⁹ As one Federal Reserve white paper explains, “In contrast to the widespread securitization of consumer credit, securitized pools consisting solely of small business loans (SBLs) are relatively rare, perhaps because it is difficult to

finance average only 1% of the securitization volumes for mortgages, for example) (Urban Institute 2021; Gerard, LoMonico, Voorhees, and Wiener 2022).

This market is served by both bank and nonbank lenders. These lenders differ in their business model and regulation. In terms of business model, banks tend to serve a broader set of clients (including households, private and public firms, and farms) and offer a wider range of financial services (including deposits, trusts, financial planning, mortgages, credit cards, and loans).

In terms of regulation, U.S. banks face oversight from the Federal Reserve System, Office of the Comptroller of the Currency, and Federal Deposit Insurance Corporation. Credit standards are a considerable focus of this oversight: banks must demonstrate they have developed and are enforcing written policies and procedures related to measuring and controlling credit risk (OCC 2014, 2020). Collecting financial statements and other information from borrowers aids banks' compliance efforts. As Basel (2000) explains:

The credit files should include all of the information necessary to ascertain the current financial condition of the borrower or counterparty as well as sufficient information to track the decisions made and the history of the credit. For example, the credit files should include current financial statements, financial analyses and internal rating documentation, internal memoranda, reference letters, and appraisals.¹⁰

Nonbanks face no such oversight of their credit standards. Nonbanks can be further divided into captives, independents, and fintech lenders. Captive lenders are owned by the equipment manufacturer, and created for the purposes of making customers' equipment purchases more convenient. They typically only offer financing for the manufacturer's products. Independent finance companies are not owned by any manufacturer, and thus have more flexibility to finance

deal with the great heterogeneity in business loans and in the collateral that might be repossessed in the event that those loans default" (Wilcox 2011).

¹⁰ The Basel guidance also links bank failures in the 1990s to failure to monitor borrowers and develop an adequate credit review process: "banks experiencing fraud-related losses have neglected to inspect collateral, such as goods in a warehouse or on a showroom floor, have not authenticated or valued financial assets presented as collateral, or have not required audited financial statements and carefully analysed them."

equipment of any type or manufacturer. Fintech lenders, while originating a sizable share of mortgages since 2007 (Buchak et al. 2018), only recently have developed a nontrivial market share in the commercial lending market (Erel and Liebersohn 2020; Chernenko and Scharfstein 2022; Howell et al. 2022).

In the U.S., the largest nonbank lenders rival the largest bank lenders in total secured originations. The top 10 lenders include Wells Fargo and U.S. Bancorp (banks), John Deere, Kubota, CNH Industrial, and Caterpillar (captives), and GE Capital (Independent). Of all lenders in our sample, John Deere originates the most contracts.

3 Data and Summary Statistics

3.1 Data

To examine AFS collection, we access data from the Risk Management Association (RMA). RMA gathers financial statements collected by banks, and categorizes them according to statement type (unqualified audit, review, compilation, tax return or other), and the borrower's six-digit NAICS code, region (Northeast, Southeast, Central, South Central, North Central, or West), and size category (<\$1 million, \$1-\$3 million, \$3-5 million, \$5-\$10 million, \$10-\$25 million, or >\$25 million of revenue).

RMA's categorization of the five statement types allows us to measure the extent to which banks rely upon AFS—unqualified audits, reviews, and compilations—in lending. First, unqualified audits provide positive assurance from an independent accountant that the financial statements are reported in accordance with Generally Accepted Accounting Principles (GAAP). Unqualified audits are accompanied by complete footnote disclosure, thus providing the most information and highest assurance level of all statement types. Second, reviews provide only negative assurance—an independent accountant performs analytical procedures and interviews management to assess whether the financial statements are misstated, but does not perform

substantive procedures to obtain positive evidence of an account balance. Third, compilations provide no assurance about financial statement balances; an independent accountant merely organizes the firm’s financial information in the form of GAAP financial statements. Thus, unqualified audits, reviews, and compilations represent AFS given the attestation provided by an independent accountant.¹¹

We classify the two remaining statement types without CPA attestation—tax returns and other statements—as non-AFS. All U.S. firms are required to file a tax return with the IRS annually, which is prepared using a tax basis of accounting, and lacks footnotes and a cash flow statement.¹² The primary verification mechanism is corporate tax enforcement (e.g., Gallemore and Jacob 2020), rather than external assurance. (Although an independent CPA may prepare the tax return, they generally do not provide assurance around the numbers in the return nor is tax return preparation considered an “attestation” service).

“Other” statements include financial statements that do not fit into any of the aforementioned categories. The overwhelming majority are management-prepared reports lacking any attestation by a CPA. Unfortunately, RMA classifies one type of attestation report as “other”: qualified audits in which an independent CPA provides an “except for” opinion stating that the financial statements follow GAAP except for certain aspects. Historically, RMA categorized qualified reports separately, but began consolidating them with “other” statements because they appeared so infrequently. RMA provided us with data from 2012 and 2017 confirming that qualified audits represent less than 3% of financial statements collected in both years, indicating growth in qualified audit opinions is immaterial and not driving the trend we identify. Information sources that are not in the form of a financial statement—for example, credit reports or loan officer

¹¹ Approximate costs for these statement types reflect the amount of information and assurance provided. Badertscher et al. (2022) report that, for a firm with \$5M-\$10M of assets, unqualified audits cost \$46,000, reviews cost \$19,000, and compilations cost \$7,000.

¹² Firms with less than \$250,000 in assets do not have to produce a balance sheet.

notes (e.g., Campbell, Loumioti, and Wittenberg-Moerman 2019)—are not included in the dataset, as RMA’s main purpose in assembling the data is to tabulate financial statement ratios by industry and borrower size, and provide this information to its bank members.¹³ Given tax returns and other statements generally provide less information and no assurance, they are considered lower information quality statements for the purposes of bank screening and monitoring.

To illustrate the data, for a given bank, we observe the total number of financial statements collected from borrowers in the Northeast in NAICS 321920 (wood container and pallet manufacturing) with between \$5 million and \$10 million of revenue, in 2012, categorized by the type of statement collected. If a borrower provides more than one statement to the bank, RMA records the statement with the highest verification level. RMA publishes summary statistics from this data in its Annual Statement Studies, and lists participating banks. In a typical year, at least eight of the ten largest U.S. commercial banks participate. Our sample covers nearly 3 million financial statements collected during 4,519 bank-years between 2002 and 2017 (we do not observe the statements themselves; just the aggregate figures by bank, statement type, industry, region, firm size category, and year). Appendix A provides additional detail on RMA’s collection process and dataset.

We supplement the RMA data with three additional data sources for the cross-sectional analyses in the second part of the paper. First, we obtain a sample of public liens on business property, also known as “UCC filings” or “UCC-1 filings” (secured credit transactions are governed under Article 9 of the Uniform Commercial Code), from all 50 U.S. states. Lenders make UCC filings with the borrower’s Secretary of State to legally establish claim to collateral that the borrower pledges to obtain financing. Filings specify the borrower, lender, and details about the

¹³ In addition, RMA’s data collection process described in Appendix A eliminates statements that do not include a balance sheet that balances or a complete income statement.

collateral (e.g., the make, model, year, serial number, and features of a piece of equipment such as its horsepower or condition) to ensure correct identification in the event of default or dispute. Lenders face strong incentives to make UCC filings for secured contracts.¹⁴ Doing so establishes their priority in the event of bankruptcy, and the cost of filing is small (typically \$25 or less). Figure 2 provides an example UCC filing.

Randall-Reilly, a data vendor focused on the equipment finance sector, has compiled a comprehensive dataset (Equipment Data Associates data, or “EDA” data) based on UCC filings dating back to the 1990s. From each UCC filing, they extract all borrower, lender, and collateral information, and combine it with additional borrower data from DNB and other datasets. They also assign each piece of collateral to one of 497 equipment codes (the primary categories they cover include agriculture, construction, office, lift trucks, logging, machine tools, medical, trucking, and woodworking). Filings occasionally contain an equipment value; when this is missing, Randall-Reilly appends an estimated value based on list prices, auction values, trade publications, and survey information. At the county-year level, the correlation between the total number of filings and dollar value of equipment financed is 0.97 (Gopal and Schnabl 2022). EDA also cleans and standardizes borrower and lender names, and the manufacturer, model, and year of each piece of equipment to facilitate analysis.

Randall-Reilly’s primary business is selling data to over 4,400 equipment manufacturers and lenders, who use it to guide their marketing efforts and identify industry trends. Randall-Reilly has several hundred employees focused on extracting, cleaning, and augmenting data from UCC filings. UCC filing data similar to ours (from EDA or competing vendors) has been used in

¹⁴ Lenders commonly make UCC filings for leases, even though they retain ownership of the asset, because courts often recharacterize operating leases as capital leases in bankruptcy (Contino 1996; Gopal and Schnabl 2022).

Edgerton (2012), Thakor (2018), Murfin and Pratt (2019), Gopal (2021), Ma, Murfin, and Pratt (2022), and Gopal and Schnabl (2022).

Second, we collect CPA firm license data from websites populated by State Boards of Accountancy (see also Vetter 2022 and Sutherland, Uckert, and Vetter 2021). Each license details the name, address, and the license number, state, issuance date, and expiration date. Because parts of our estimation rely on identifying stocks and flows of CPA firms, we drop licenses from states that do not consistently report information about expired licenses. Our license data cover over 50,000 unique CPA firms in over 2,000 counties between 1997 and 2019. Our balanced panel contains 43,470 county-year observations.

Third, we develop a proxy for lenders' technology adoption using data from PayNet. Founded in 2001, PayNet is a commercial credit bureau focused on the U.S. equipment finance market. According to their website, their database contains \$1.7 trillion of current and past obligations from 25 million lease and loan contracts, which they claim is the "largest proprietary database of small business loans, leases, and lines of credit in existence."¹⁵ Between the 2001 launch and the end of our sample in 2014, we observe over 200 lenders join PayNet, including captives, independent finance companies, and banks. PayNet data is used in Doblus-Madrid and Minetti (2013), Chen, Hanson, and Stein (2017), Sutherland (2018), Darmouni and Sutherland (2021), and Liberti et al. (2022).

Our PayNet data consists of a panel of 20,000 randomly chosen borrowers' credit files, spanning 1998 to 2014. The credit files detail over 400,000 contracts of these borrowers with any lender who has ever joined PayNet, totaling nearly six million contract-quarter observations. We do not observe lender or borrower identities, just an anonymous identifier. Useful for our purposes

¹⁵ "Transforming commercial lending," PayNet, July 18, 2022. Accessed at <https://paynet.com/about/>

of investigating technology adoption, (1) we observe lenders enter the bureau in a staggered pattern, and (2) lenders' varying specialization results in shocks to the information available to bureau members. For example, a captive lender focused on agricultural equipment may join one quarter, and a medium-sized bank with a diversified portfolio may join the next. This helps us identify technology-driven information shocks separate from broad economic trends or the overall state of technology, because we can trace how lending changes within specific sectors and locations.

3.2 Summary Statistics

Table 2 presents summary statistics. In Panel A, we describe the financial statement data from RMA. Of the nearly 3 million borrower financial statements collected by banks in the dataset, 22% are unqualified audits and 47% are AFS (unqualified audits, reviews, or compilations). The average (median) number of statements collected within the bank-industry-region-year unit of observation is 11 (2). Based on RMA's size categories, 16% of statements come from firms with less than \$1 million of annual revenue, 16% from firms with \$1-\$3 million, 9% with \$3-5 million, 13% with \$5-\$10 million, 16% with \$10-\$25 million, and 31% with over \$25 million.

Panel B describes the EDA and PayNet data. We identify banks and nonbanks based on the EDA lender name field, using the algorithms in Erel and Liebersohn (2020), Chernenko and Scharfstein (2022), Gopal and Schnabl (2022), and Howell et al. (2022). For the average county-year, there are 32 UCC filings for banks and 73 for nonbanks. Based on EDA's estimated equipment values, this represents \$3.79 million of equipment financed by banks and \$6.68 million by nonbanks. In the average (median) county, there are 20.1 (two) CPA firms. Twenty-nine percent of counties are CPA deserts, defined as counties with zero CPA firms. As for the PayNet variables measured at the state-industry-year level, on average about 80% of originations are by a PayNet member, though there is considerable heterogeneity across state-industry pairs and over time.

3.3 Three Stylized Facts

Before detailing our empirical analysis, we discuss three stylized facts motivating our investigation of technological advances and credit market structure changes as potential drivers of the AFS decline shown in Figure 1.

3.3.1 “Financial Statements not Required”

Figure 3 presents excerpts from advertisements by the U.S. equipment finance bureau, PayNet. PayNet boast the greatest coverage of U.S. SME loans and leases, and has several hundred members including eight of the ten largest lenders in the market—a group that includes GE Capital, Bank of America, John Deere, Volvo, and Wells Fargo. PayNet advertises their credit score and credit rating products using the slogan “Financial statements not required.” Their advertisements elaborate: “PayNet reduces your lending risk by providing an absolute measure of credit risk at both the borrower and portfolio level *on millions of small businesses for which financial statements are not available*” (emphasis added). Figure 4 presents a collage of advertisements of other SME data vendors (Rutter, Enigma, and Tax Status). The advertisements discuss various ways these vendors help lenders obtain alternative data or financial statement components (rather than complete, externally verified financial statements) to aid their screening and monitoring.

3.3.2 Credit Manager Survey

Figure 4 presents select responses to the 10th annual Credit Managers Survey, conducted by the Equipment Lease and Finance Association (ELFA 2021), the trade association representing the equipment finance sector. The survey asked 211 equipment finance credit managers about their credit process, regulatory burdens, and macroeconomic and technological trends. Our focus is on

the “Credit Scoring Threshold”—the loan size credit managers report being authorized to approve based on credit scores alone (i.e., no other information collection is required—financial statements or otherwise). Panel A reports that in 2017, just 5% (40%) of respondents report a credit scoring threshold of over \$750,000 (\$150,000) whereas in 2021 the percent jumps to 10% (50%). One respondent explained, “As we gather more data to support our scoring model... raising the scorecard threshold might become necessary” (ELFA 2021). Similarly, Panel B shows that a majority of respondents report approving loans within their firm’s credit scoring threshold in one day or less—a timeframe that is difficult to achieve with a standard AFS review by a credit manager.

3.3.3 Nonbank Lender Growth

A recent paper by Gopal and Schnabl (2022) documents growth in nonbank lending from 2006 to 2016. In Figure 6, we extend their evidence by plotting bank and nonbank originations between 1997 and 2019. Panel A shows banks and nonbanks had a similar number of UCC filings in 1997, but thereafter the nonbank filings grow more quickly. Like Gopal and Schnabl, we find a steeper drop for bank than nonbank originations during the crisis, and that nonbanks continue to grow their market share after. Panel B presents a similar analysis of the construction equipment sector—the market where EDA has the most complete coverage, and finds a similar pattern.

4 Aggregate Evidence on Banks’ Financial Statement Collection

Our first set of analyses track banks’ collection of (1) AFS and (2) unqualified audits from borrowers over the 2002-2017 period. Specifically, we track AFS and unqualified audit collection using a ratio. The numerator for AFS is the sum of unqualified audits, reviews, and compilations and the numerator for unqualified audits is the sum of unqualified audits. The denominator is the total number of statements collected by banks, including AFS, plus tax returns and the “other”

statement category. Then, in Figure 7, Panel A (B) we regress the proportion of statements that are AFS (unqualified audits) on year fixed effects, and various controls and fixed effects as described below. The unit of observation in the regressions is bank-industry-region-year, and the regressions are weighted by the number of statements collected within this unit of observation. As a baseline, the dark blue line in Figure 7 reproduces Figure 1, showing a reduction in AFS (unqualified audits) from 57% (23%) in 2002 to 33% (16%) in 2002.

Then, to evaluate the possibility that this downward trend simply stems from changes in the types of borrowers or banks in the RMA data, we plot four additional lines in each panel, corresponding to the year fixed effects of regressions that have added borrower or bank characteristics to the baseline regression. First, the red line plots the year fixed effects from a regression of either AFS or unqualified audit rates on year, industry, and region fixed effects. Industries differ in their accounting rules and the preponderance of AFS in lending, and regions differ in their mix of industries and the nature of the banking market. Therefore, sample composition changes with respect to borrower industry or location could generate a trend in statement collection between 2002 and 2017. However, in both panels, the red line is virtually indistinguishable from the dark blue line, indicating that changes in sector or geographic representation have little to do with the downward trend.

Second, we add controls for average borrower size. Larger firms are more likely to obtain AFS (Lisowsky and Minnis 2020), and changes in the size of borrowers covered by RMA could generate their own trend. However, the green line for both AFS (Panel A) and unqualified audits (Panel B) shows a highly similar decline to the dark blue line which included only year fixed effects.¹⁶ Third, banks differ in their size and specialization, and these features link to their AFS collection (Berger et al. 2017). The orange line adds bank fixed effects and finds a slightly less

¹⁶ Similarly, when we plot statement collection by borrower size group, we find declines across all groups.

stark, though still notable, decline (AFS declines from 53% to 35% and unqualified audits decline from 21% to 16%). Adding time-varying controls for bank fundamentals (e.g., size, profitability, growth, loan loss provisions, capitalization, and exposure types) does not alter our inferences (not tabulated for brevity).

Fourth, we consider the possibility that the trend stems from changes in the set of banks voluntarily participating in RMA's annual statement studies. Specifically, we limit the sample to banks participating every single year between 2002 and 2017, and continue to include bank fixed effects. The light blue line shows a marked decline that is comparable to our baseline result (though the starting and end points of this plot are lower, likely due to us losing nearly 70% of our sample and studying a specific subset of banks meeting the constant participation requirement). In sum, Figure 7 provides little indication that changes in borrower or bank composition are driving the decline in AFS or unqualified audit collection.

Figure 8 splits the original sample based on whether the borrowers belong to NAICS codes associated with governments and schools (two digit NAICs codes 61 and 92) versus other industries. Governments and schools commonly face reporting mandates, and therefore their supply of AFS is relatively inelastic. Borrowers in the remaining industries, by contrast, often obtain AFS based on their banking relationship. To focus on this elasticity, we limit the sample to borrowers with at least \$25 million of revenue (such that most governments and schools begin with AFS). If the downward trend we document earlier is a mechanical artifact of inflation or common macroeconomic developments, then we would expect similar declines for both subsamples. However, Figure 8 shows little AFS decline for governments and schools (from 90% in 2002 to 84% in 2017) and a major decline for other sectors (63% to 46%). This pattern lends credibility to our hypothesis that marketplace developments could be behind the decline in AFS collection, because borrowers with the most elastic AFS supply experience the sharpest decline.

To this point, we have shown a stark decline in the proportion of AFS collected by banks, and that this pattern is not explained by sample composition changes. The remainder of the paper focuses on three specific marketplace developments that we hypothesize explain at least part of the decline: two demand-side changes (technology adoption and nonbank lending competition) and one supply-side change (CPA peer review mandates).

5 Demand-side Factors Affecting Banks' AFS Collection

5.1 Technology Adoption

This section develops cross-sectional evidence on technology adoption and nonbank lending. For technology adoption, we examine AFS collection using the following generalized difference-in-differences estimation:

$$y_{ist} = \alpha_i + \alpha_{st} + Tech\ Adoption\ Rate_{ist} + Size_{ist} + \varepsilon_{ist}. \quad (1)$$

The unit of observation is industry-state-year, where i indexes industries based on three-digit NAICS codes, s indexes states, and t indexes years. The dependent variable is *Unqualified* or *AFS*, the proportion of statements collected by banks that industry-state-year that are unqualified audits (unqualified audits, reviews, or compilations). We control for industry fixed effects (α_i) to abstract away from differences in reporting practices across sectors, and state-year fixed effects (α_{st}) to account for economic conditions in each state as well as common factors such as accounting standards. *Tech Adoption Rate* is the proportion of contracts or credit originated that industry-state-year by lender members of PayNet. Intuitively, this variable captures technology adoption in a market by measuring the extent of lending based on information sharing technology. Variation in this variable comes from a) lenders joining PayNet in a staggered pattern, and b) lender specialization. Thus, the bureau's information coverage evolves not in a linear pattern (as with common technology growth), but an uneven pattern given lenders with different exposure join each quarter. *Size* measures the log average borrower sales that state-industry-year. We double cluster standard errors by industry and state. The sample is limited to banks operating in only one

RMA region (the Northeast, Southeast, Central, South Central, North Central, or West) such that we can reasonably trace statement collection within an industry-state to the extent of information sharing in the industry-state.¹⁷

Table 3 presents the results. Column 1 shows that unqualified audit collection declines with the share of contracts originated by bureau members in that industry-state. Economically, a one standard deviation increase in *Tech Adoption Rate* reduces *Unqualified* by 0.6%, a nontrivial decline compared to the regression sample mean rate of 15%. Column 2 studies unqualified audit, review, and compilation collection and again finds a decline with technology adoption. Columns 3 and 4 repeat these tests using the *Tech Adoption Rate* measure based on dollars of credit originated by bureau members in the industry-state. We arrive at very similar inferences. Likewise, our results are unaffected by employing different fixed effect combinations (e.g., industry-year and state or industry-state and year).

5.2 Nonbank Lending

5.2.1 Research Design and Results

Next, we study nonbank lending using the EDA data. We model originations using the following generalized difference-in-differences estimation:

$$y_{cjt} = \alpha_{cj} + \alpha_{jt} + \text{Log CPA Firms}_{ct} \times \text{Bank}_j + \text{Log CPA Firms}_{ct} \times \text{Nonbank}_j + \varepsilon_{cjt}. \quad (2)$$

The unit of observation is county-lender type-year, where c indexes counties, j indexes lender type (bank or nonbank), and t indexes years. The dependent variable is *Log Filings*, one plus the log number of UCC filings, or *Log Value*, the log dollar value of equipment securing the contract as estimated by EDA.¹⁸ We control for county-lender type fixed effects (α_{cj}) to account for time-invariant factors affecting bank and nonbank lending in each county, including the

¹⁷ Unfortunately, the RMA does not provide more granular regional detail.

¹⁸ Actual prices are provided for under 10% of the UCC filings. For many of the remaining filings, EDA appends a value estimate based on its database of list prices, auctions, trade publications, and survey information.

industry base and geography. We control for lender type-year fixed effects (α_{jt}) to account for the overall state of the economy and how it affects lender types differently. *Log CPA Firms* is the log number of unique CPA firms licensed in the county that year. We cluster standard errors by county.

Table 4 presents the results of estimating equation (2). In terms of the number of originations, column 1 shows that bank lending is nearly twice as sensitive to CPA supply as nonbank lending, and the difference is statistically significant at the 1% level. Economically, a one standard deviation change in CPA supply measured within the county is associated with a 0.33 standard deviation change in bank originations, but only a 0.14 standard deviation change in nonbank originations. Column 2 adds a county-year fixed effects, such that we compare the lending change for banks and nonbanks within the same location and time period. Our inferences are similar.

Columns 3 and 4 repeat these tests using *Log Value* as the dependent variable. Again, we find far greater lending sensitivity to CPA supply for banks than nonbanks. A one standard deviation change in CPA supply measured within the county is associated with a 0.60 standard deviation change in bank financing, but only a 0.20 standard deviation change in nonbank financing. Once again using a within county-year estimation in column 4 produces similar inferences.

5.2.2 Robustness

Table 5 provides robustness analyses for these results. For parsimony, we focus on column 2 of Table 4, containing our strictest (within county-year) estimation.

First, we measure CPA supply using census data rather than CPA firm license data. Although the license data specifically tracks registered CPA firms separately from related firms (e.g., bookkeeping services and tax preparation firms), one limitation of the license data is that it

only provides current addresses, which introduces measurement error for historical county assignments. Column 1 shows our results are unaffected.

Second, we develop a CPA supply measure designed to capture more drastic changes in the availability of CPA services. Specifically, we identify counties that have zero CPA firms, or “CPA deserts” (similar to banking deserts or food deserts in related literature). Our inclusion of county-year fixed effects means that our estimation using this measure effectively analyzes what happens to originations when a county becomes or emerges from being a CPA desert. Column 2 finds a similar pattern of results to Table 4: bank lending is far more sensitive than nonbank lending to CPA supply changes. Figure 9 studies lending in event time in the four years surrounding a county becoming a CPA desert. In the pre-desert period, bank and nonbank lending evolve similarly (the confidence bands overlap). After the county becomes a desert, bank lending significantly declines, and nonbank lending slightly increases, indicating a substitution toward nonbanks.

Third, banks and nonbanks may respond differently to economic conditions, even within the same county. As one example, Gopal and Schnabl (2022) find nonbanks filled much of the void created by bank lending decreasing following the financial crisis. Then, if CPA supply reductions are driven by a deterioration in economic conditions, for example, the bank and nonbank differential lending pattern we document may be spurious. Although equation (2) controls for lender type \times year fixed effects, this may not adequately account for geographic variation in the business cycle. To address this, we augment equation (2) with state \times lender type \times year fixed effects, which more flexibly and robustly account for how different lenders respond to local economic conditions. Column 3 shows our results are slightly stronger than in Table 4.

Overall, our findings are best explained by banks and nonbanks having different sensitivity to CPA supply, and not our choice of CPA supply measures or how banks and nonbanks respond to economic conditions.

5.2.3 Time Series Evidence

Next, we investigate how the sensitivity of bank and nonbank lending to CPA supply changes over time. Specifically, we divide our 2000-2019 sample period into four equal-length periods (2000-2004, 2005-2009, 2010-2014, and 2015-2019) and re-estimate equation (2) on each. Table 6 presents the results, with Panel A studying filings and Panel B studying the value of equipment financed.

Panel A shows that the coefficient on *Log CPA Firms x Bank* declines by over two-thirds over the two-decade period, from 0.709 in 2000-2004 (column 1) to 0.194 in 2014-2019 (column 4). The decline is statistically significant at the 1% level. The interaction term for nonbanks also declines over this period, but by less (the difference between the bank and nonbank interaction terms declines by approximately one-third). This pattern is not a simple artifact of declining variation in the number of CPA firms: the coefficient of variation for CPA firms is 0.26 or 0.27 every period. Panel B shows a similar pattern for the value of equipment financed. Thus, the overall trend is that banks increasingly behave more like nonbanks in terms of their sensitivity of lending to CPA supply, and both banks and nonbank lending has become less responsive to CPA supply changes.

6 Supply-side Factor: Peer Review Mandates

Our investigation of technological advances and nonbank lender growth requires us to hold AFS supply constant, to identify changes in AFS demand. However, given the stark decline in AFS collection, supply factors may be interesting to consider on their own. While a full

investigation is beyond the scope of our paper, our final tests explore one oft-mentioned development affecting CPA firms that cater to SMEs in our sample: growing regulatory burden. Specifically, we examine peer review mandates.

Peer review is one of the main mechanisms for maintaining and monitoring CPA service quality (Anantharaman 2012; Loehlein 2016). Under peer review, CPA firms must select another CPA firm to review their engagements and internal controls. Following a wave of audit failures in the 1970s, State Boards of Accountancy began requiring CPA firms to undergo peer review in order to renew their license (typically every two or three years). Firms can receive a “pass”, “pass with deficiencies,” or “substandard” review rating. Although the ratings are nonpublic, receiving a “substandard” rating is costly because state boards can pursue enforcement actions, impose fines, and require additional education hours for owners. Beyond these outcome-related costs, reviews impose direct costs (\$500 to \$2,000 for the smallest CPA firms plus \$420 *per engagement* reviewed) and indirect costs (document preparation, peer reviewer search and scheduling, disruption of practice).

States adopted peer review mandates in a staggered pattern. Although the largest CPA firms serving public clients underwent peer review prior, the mandates represented a significant new burden for smaller CPA firms, who cater to the SME borrowers in our study. Consistent with this, Vetter (2022) finds CPA firm exit rates roughly double following states’ enactment of peer review mandates. Thus, we examine peer review mandates as a meaningful regulatory development that shifted CPA supply, and thus reduced the appeal of AFS in debt contracting.

We examine AFS collection by banks using the following generalized difference-in-differences estimation:

$$y_{st} = \alpha_s + \alpha_t + Post\ Peer\ Review_{st} + Size_{st} + \varepsilon_{st}. \quad (3)$$

The unit of observation is state-year, where s indexes states and t indexes years. The dependent variable is *Unqualified* or *AFS*, the proportion of statements collected by banks that state-year that are unqualified audits (unqualified audits, reviews, or compilations). We control for state fixed effects (α_s) to account for time-invariant factors affecting AFS collection in each state, and year fixed effects (α_t) to account for accounting standards and overall economic conditions. *Post Peer Review* is an indicator variable for years after the state has adopted a peer review mandate for all CPA firms. *Size* measures the log average borrower sales that state-year. We cluster standard errors by state. The sample is limited to banks operating in only one RMA region.

Table 7 presents the results from estimating equation (3). Column 1 shows that 4.5% fewer unqualified audits are collected following peer review mandates. Column 2 studies CPA-verified statements and finds an insignificant decline.¹⁹ Columns 3 and 4 repeat our tests after including controls for the weights for each OCC sector in the state-year (measured based on total borrower sales). The pattern of results is similar, though the *Post Peer Review* coefficient for unqualified audits attenuates to -2.9%.

7 Conclusion

SMEs in the U.S. face no reporting mandate, and their decision to engage a CPA firm is often a function of their lending relationships. Using a sample of nearly 3 million borrower financial statements collected by banks since 2002, we document a striking trend: banks are significantly less likely to collect AFS as part of their screening and monitoring efforts. In 2002, 57% of borrowers provided AFS to their bank, and this rate nearly monotonically declines to just 33% in 2017. For unqualified audits, the collection rate declines from 23% to 16% over the same period. These declines do not appear to be driven by composition changes, because we find a

¹⁹ One plausible explanation for this results pattern is that some firms that obtained unqualified audits before the mandate switched to reviews and compilations, and some firms that obtained reviews or compilations before the mandate also switched to lower verification statements. Such substitution could result in a significant decline in unqualified audits but little detectable change in *AFS*.

similar pattern after controlling for borrower characteristics (industry, location, and size) and bank fixed effects, and limiting the sample to banks sharing data with RMA every year.

We investigate two recent lending market developments for their potential to contribute to the trend. First, technological advances in information sharing, digitization, and data analytics have provided lenders with new alternative information sources that can substitute for AFS. PayNet, a large U.S. credit bureau, advertises itself using the slogan “Financial statements not required” and we trace its evolution to reduced AFS collection. Second, nonbank lender market share has grown considerably over the past two decades, and for regulatory and business model reasons, these lenders rely less on AFS in screening and monitoring. As nonbank market share has grown, bank lending has become less sensitive to CPA supply, consistent with banks adjusting their reporting requirements in response to nonbank competition.

Overall, we document a startling trend in AFS collection that poses significant questions for the literature, accounting practice, and standard setters. While our focus limits our analysis to three plausible drivers of the trend, there are undoubtedly others at play. For example, technology has transformed credit origination in ways beyond the credit scoring innovations we study (e.g., He et al. 2021). Moreover, the market for CPA services has faced changes in both audit regulation and accounting standards for private firms (see Financial Accounting Foundation 2011 for a discussion). We encourage future research to investigate the role that these developments and others have played in the decline in AFS collection by banks.

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Figure 1: Banks' Attested Financial Statement Collection

This figure plots banks' yearly average AFS collection rates between 2002 and 2017.

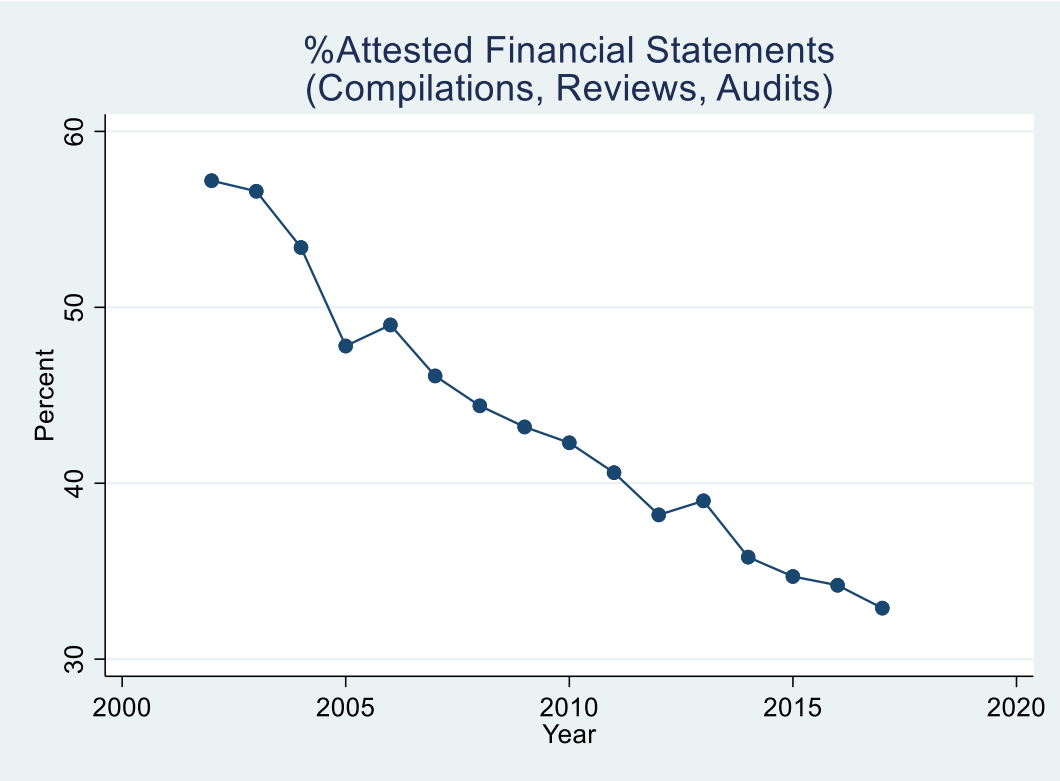


Figure 2: Example UCC Filing

The figure below provides an example UCC filing. The filing documents a loan for a forklift from Toyota Industries Commercial Finance, Inc. The forklift is a Toyota Model # 7FBEU18, and the serial number is #21898.

UCC-1 Form

FILER INFORMATION

Full name: LIEN SOLUTIONS

Email Contact at Filer: UCCFILINGRETURN@WOLTERSCLUWER.COM

SEND ACKNOWLEDGEMENT TO

Contact name: LIEN SOLUTIONS

Mailing Address: P.O. BOX 29071

City, State Zip Country: GLENDALE, CA 91209-9071 USA

DEBTOR INFORMATION

Org. Name: SHAWMUT CORPORATION

Mailing Address: 208 MANLEY ST

City, State Zip Country: WEST BRIDGEWATER, MA 02379-1044 USA

SECURED PARTY INFORMATION

Org. Name: TOYOTA INDUSTRIES COMMERCIAL FINANCE, INC.

Mailing Address: P.O. BOX 9050

City, State Zip Country: DALLAS, TX 75019-9050 USA

TRANSACTION TYPE: STANDARD

ALTERNATIVE DESIGNATION:

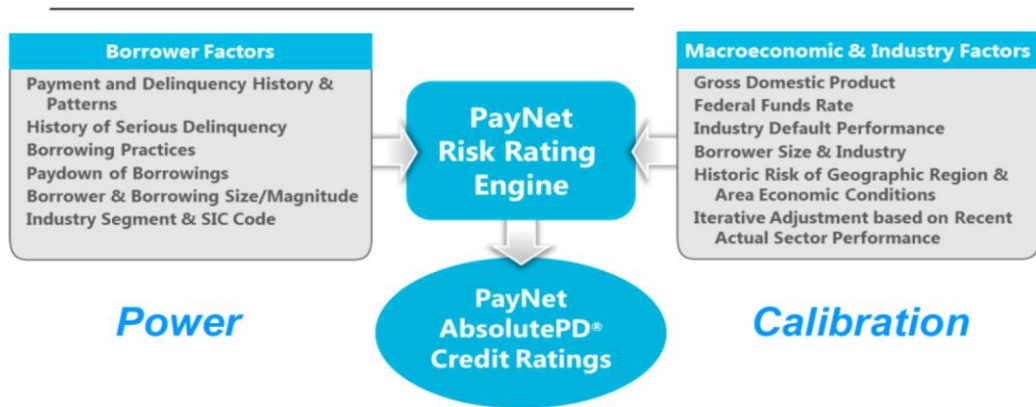
CUSTOMER REFERENCE: MA-0-67035011-56034684

COLLATERAL

ONE (1) TOYOTA FORKLIFT MODEL # 7FBEU18 SERIAL # 21898

Figure 3: Technology Adoption in the SME Lending Market—PayNet

This figure provides excerpts from an advertisement by the U.S. equipment finance credit bureau, PayNet (emphasis added).



Financial statements not required

PayNet reduces your lending risk by providing an absolute measure of credit risk at both the borrower and portfolio level on millions of small businesses for which financial statements are not available. PayNet's AbsolutePD product provides the only probability of defaults for private companies by geographic regions, industry sectors, and loan exposures.

PayNet AbsolutePD provides a consistent, transparent and objective loan management process mandated by management, auditors, regulators CEO's and investors.

PayNet AbsolutePD:

- Rates millions of private companies for which current and/or reliable financial statements are not available

Figure 4: Technology Adoption in the SME Lending Market

This figure provides website excerpts from several vendors (Rutter, Enigma, and Tax Status) specializing in providing alternative information and other tools to commercial lenders.



Connect to accounting and commerce platforms with a universal API

Rutter provides a single API and schema for fetching financial data from any payment processor, storefront, or accounting platform, so adding a new platform takes minutes.

Rutter allows developers to write code once and launch on 40+ commerce platforms with zero maintenance cost going forward.



Modeling the story of every small business.

Enigma provides a single reliable source for all of the alternative small business data you need. Explore our rapidly expanding selection of data.



PREDICT DEFAULT LIKELIHOOD

Our customers have found definitive splitting power in predicting delinquencies.



SET SMARTER CREDIT LIMITS

Richer data improves your initial credit limits and loan amounts, while monthly updates monitor changes in risk.

The fastest way to access IRS financial data.

Businesses of all sizes use Tax Status to quickly and securely verify tax returns and income data for existing and potential clients.

"Our SBA loan pipeline was backed up waiting for IRS transcripts to come back via our IVES provider. The backlog was 77 loans and our customers, employees and leadership were all equally frustrated. Tax Status really delivers faster than anyone else and our borrowers with more complicated loans love the single consent for all of their businesses!"

- Commercial Lending Manager / \$1.5 Billion Bank



All tax records, not just a few

From client consent to the arrival of tax records, everything is digital. It's simple, automated, and offers a complete look at the entire history, not just a year or two.



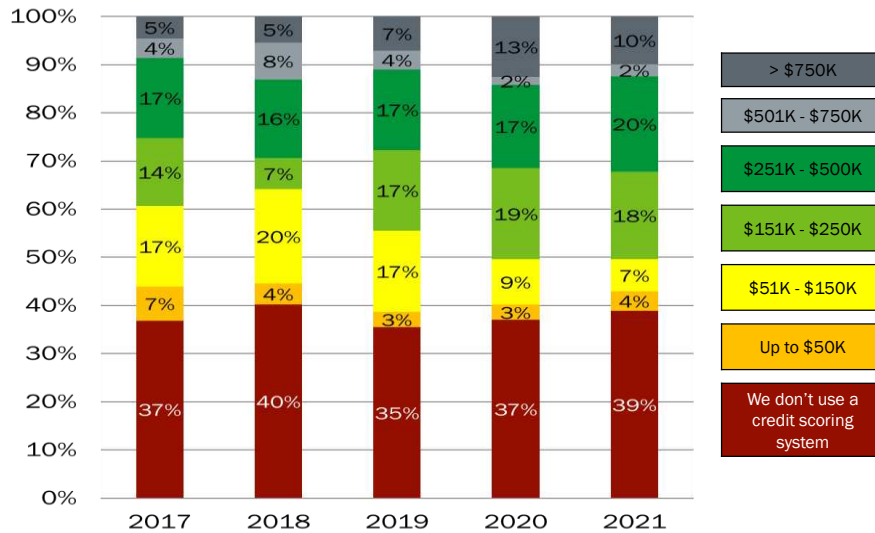
Update any tax record in seconds

Automated records from the IRS take minutes or hours – not weeks. Update any of the tax records in seconds.

Figure 5: Credit Managers Survey

This figure presents responses to the 10th annual Credit Managers Survey, conducted by the Equipment Lease and Finance Association (ELFA 2021). The “Credit Scoring Threshold” refers to the loan size credit managers report being authorized to approve based on credit scores alone. Panel B reports credit application turnaround times by lender type.

Panel A: Credit Scoring Threshold



Panel B: Credit Application Turnaround Times for Loans within Credit Scoring Threshold

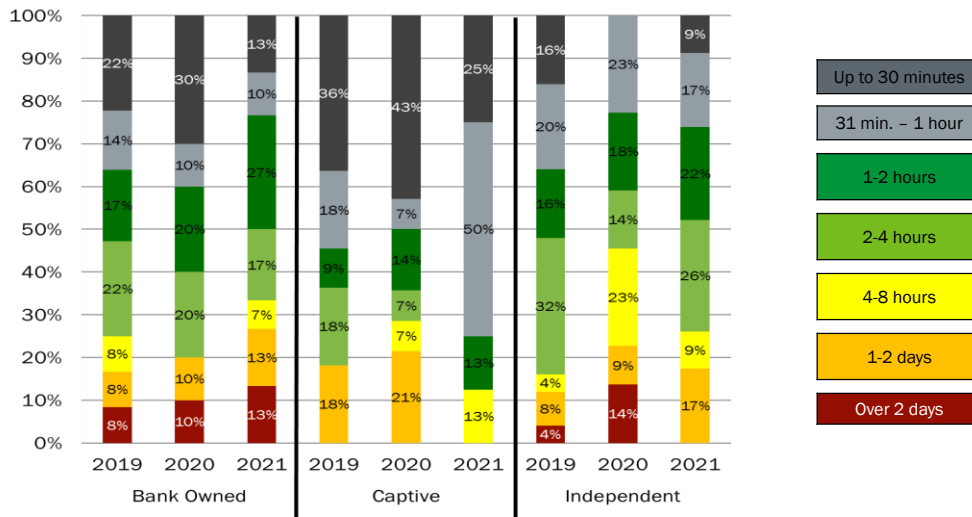
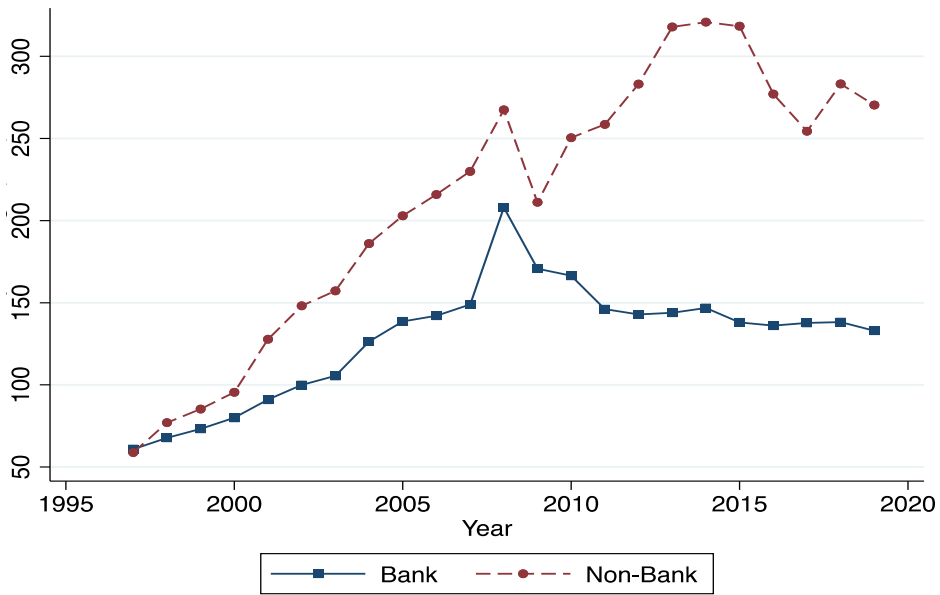


Figure 6: Originations by Lender Type

This figure presents the number of UCC filings (in thousands) in the EDA dataset for banks and nonbanks since 1997. Panel A includes the full sample, while Panel B is limited to contracts for construction equipment.

Panel A: Full Sample



Panel B: Construction Equipment

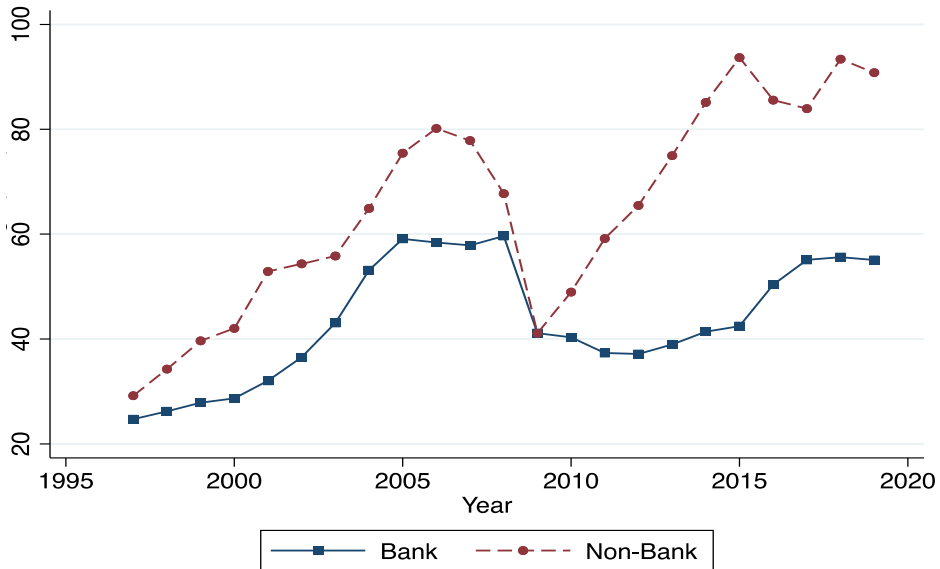
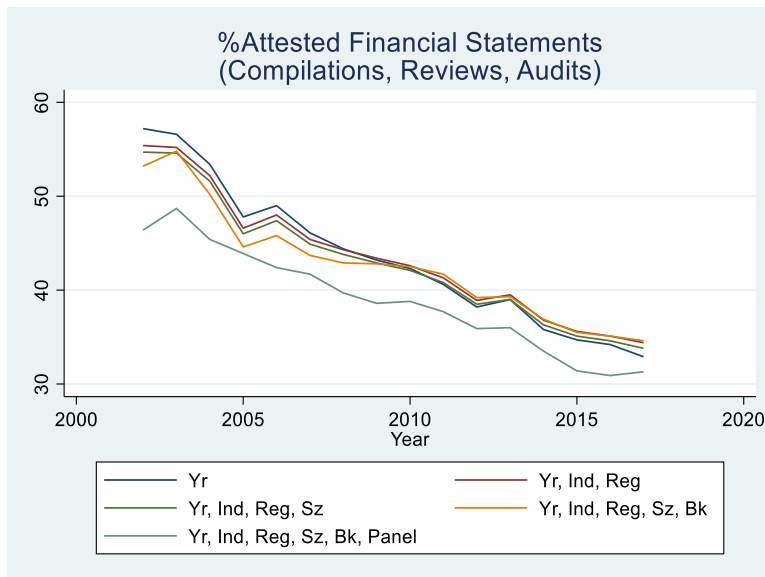


Figure 7: Banks' Financial Statement Collection

This figure plots banks' financial statement collection rates between 2002 and 2017. Panel A (B) models the percent of statements collected that are Attested Financial Statements (Unqualified Audits). Each panel plots the year fixed effects from a regression with different fixed effects, controls, and samples as labeled in the legend. *Yr*, *Ind*, *Reg*, and *Bk* refer to year, three-digit industry, region, and bank fixed effects, respectively. *Sz* refers to a control for log average borrower sales. *Panel* refers to a constant panel of banks participating in RMA every year between 2002 and 2017. The unit of observation in the regression is bank-industry-region-year.

Panel A: Attested Financial Statements



Panel B: Unqualified Audits

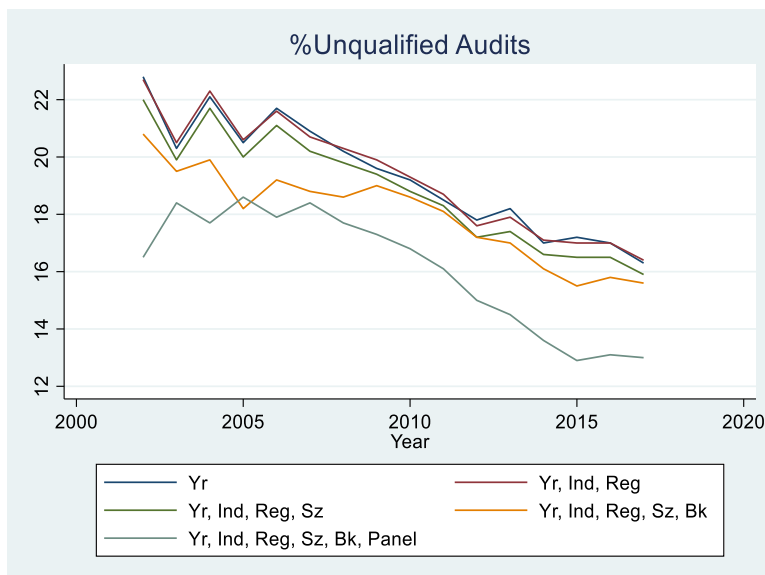
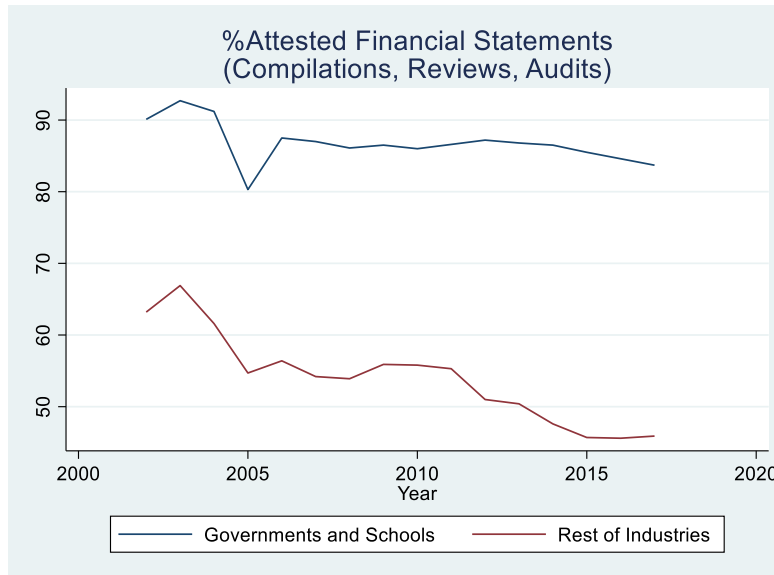


Figure 8: Banks' Financial Statement Collection

This figure plots banks' financial statement collection rates between 2002 and 2017 for two subsamples: (1) governments and schools, and (2) all other industries. Panel A (B) models the percent of statements collected that are Attested Financial Statements (Unqualified Audits). Each panel plots the year fixed effects from a regression with year, industry, region, and bank fixed effects and a control for log average borrower sales. The sample is limited to borrowers with \$25 million or more of revenue. The unit of observation in the regression is bank-industry-region-year.

Panel A: Attested Financial Statements



Panel B: Unqualified Audits

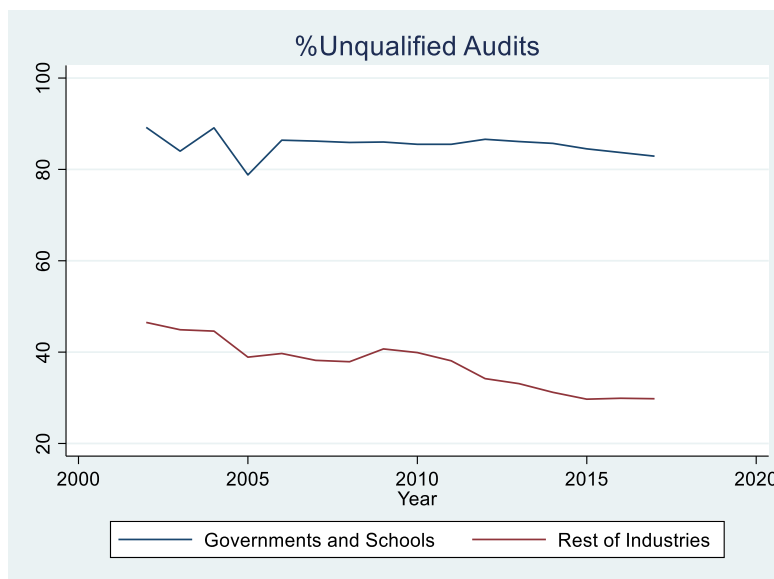


Figure 9: CPA Deserts and Lending

This figure plots the coefficients from a piecewise version of equation (2) using event year indicators. At $t=0$, the county becomes a CPA desert. The dependent variable is *Log Filings*, one plus the log number of UCC filings that county-year for banks or nonbanks. The lines plot 95% level confidence intervals. The holdout period is $t=-2$.

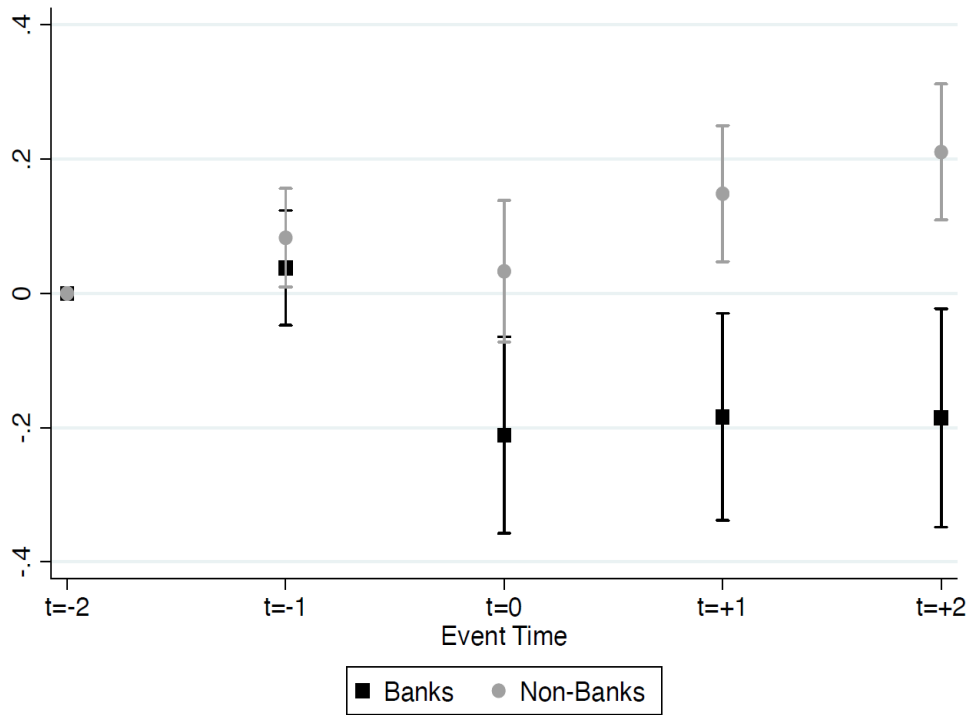


Figure 10: Variable Definitions

	Definition
Unqualified	The proportion of financial statements collected by banks that are unqualified audits.
AFS	The proportion of financial statements collected by banks that are unqualified audits, reviews, or compilations (i.e., attested financial statements).
Avg Borrower Size	The ratio of total firm sales for all of the bank's exposures to the number of statements.
Tech Adoption Rate	The proportion of originations in that state-industry-year by lender members of the PayNet credit bureau.
Filings	The number of UCC filings.
Value	The dollar value of equipment securing the UCC filing.
Bank	An indicator variable equal to one for bank lenders, and zero otherwise.
Nonbank	An indicator variable equal to one for nonbank lenders, and zero otherwise.
CPA Firms	The number of CPA firms licensed in a county-year.
CPA Firms (Census)	The number of CPA firms operating in a county-year, based on census data. We identify CPA firms based on having NAICS code 541211.
CPA Desert	An indicator variable equal to one for county-years with no licensed CPA firms, and zero otherwise.
Post Peer Review	An indicator variable equal to one for years after the state has adopted a peer review mandate, and zero otherwise.

Table 1: Sample Composition—RMA Dataset

This table describes the composition of our RMA sample.

# Financial Reports	2,909,131
# Bank-Industry-Region- Year observations	258,119
# Bank- Years	4,519
# Banks	821

Table 2: Summary Statistics

This table provides summary statistics for variables in our analyses, as labelled. See Figure 10 for variables definitions.

Panel A: Figures 1, 7, 8

	<u>Mean</u>	<u>Std Dev</u>	<u>25%</u>	<u>50%</u>	<u>75%</u>	<u>N</u>
Unqualified	0.22	0.34	0.00	0.00	0.33	258,119
AFS	0.47	0.39	0.00	0.50	0.92	258,119
Number of Statements	11	47	1	2	7	258,119

Panel B: Tables 3-6

	<u>Mean</u>	<u>Std Dev</u>	<u>25%</u>	<u>50%</u>	<u>75%</u>	<u>N</u>
Filings (Banks)	32.08	65.49	6.00	15.00	34.00	43,470
Filings (Nonbanks)	73.05	121.63	16.00	40.00	86.00	43,470
Value (Banks)	3,790,000	12,100,000	353,000	1,130,000	3,030,000	43,470
Value (Nonbanks)	6,680,000	15,000,000	989,000	2,760,000	6,900,000	43,470
CPA Firms	20.10	77.31	0.00	2.00	9.00	43,470
CPA Desert	0.29	0.45	0.00	0.00	1.00	43,470
Tech Adoption Rate (# Contracts)	0.83	0.30	0.78	1.00	1.00	18,942
Tech Adoption Rate (\$ Credit)	0.82	0.33	0.79	1.00	1.00	18,942

Table 3: Technology Adoption and AFS Collection by Banks

This table models AFS collection by banks using Equation (1). The unit of observation is state-industry-year. The dependent variable in odd (even) columns is *Unqualified (AFS)*, the proportion of financial statements collected by banks in that state-industry-year that are unqualified audits (unqualified audits, reviews, or compilations). *Tech Adoption Rate* is the proportion of credit originated in that state-industry-year by lender members of the PayNet credit bureau. Columns 1 and 2 (3 and 4) measure credit originations based on the total number (dollar amount) of new contracts. *Log Avg Borrower Size* is the log of the average borrower sales in the state-industry-year. Industry is based three-digit NAICS. See Figure 10 for variables definitions. Reported below the coefficients are standard errors double clustered at the state and industry level. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	Unqualified	AFS	Unqualified	AFS
	# Contracts		\$ Contracts	
Tech Adoption Rate	-0.020*** [0.006]	-0.026** [0.010]	-0.014** [0.006]	-0.023** [0.009]
Log Avg Borrower Size	0.024*** [0.003]	0.029*** [0.003]	0.024*** [0.003]	0.029*** [0.003]
Adj R-Sq.	0.456	0.287	0.456	0.287
N	18,940	18,940	18,940	18,940
State x Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Table 4: CPA Firms and Credit by Lender Type

This table models credit originations using Equation (2). The unit of observation is county-lender type-year. The dependent variable in columns 1 and 2 (3 and 4) is *Log Filings (Log Value)*, one plus the log number of UCC filings (log dollar value of equipment financed) that county-year for banks or nonbanks (the two lender types). *Log CPA Firms* is one plus the log number of CPA firms in the county-year. See Figure 10 for variables definitions. Reported below the coefficients are standard errors clustered at the county level. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	Log Filings		Log Value	
Log CPA Firms x Bank	0.348*** (0.021)	0.169*** (0.019)	2.004*** (0.120)	1.862*** (0.110)
Log CPA Firms x Nonbank	0.197*** (0.018)		0.646*** (0.083)	
P-value for coefficient difference	0.000		0.000	
County x Lender Type FE	Yes	Yes	Yes	Yes
Lender Type x Year FE	Yes	Yes	Yes	Yes
County x Year FE		Yes		Yes
Observations	86,940	86,940	86,940	86,940
Adjusted R2	0.873	0.900	0.624	0.687

Table 5: Robustness

This table models credit originations using modified versions of Equation (2). The unit of observation is county-lender type-year. The dependent variable is *Log Filings*, one plus the log number of UCC filings that county-year for banks or nonbanks. In column 1, we use census data to measure the number of CPA firms. In column 2, *CPA Desert* is an indicator variable for county-years with zero CPA firms. In column 3, we introduce state x lender type x year fixed effects. See Figure 10 for variables definitions. Reported below the coefficients are standard errors clustered at the county level. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	Log Filings	Log Filings	Log Filings
Log CPA Firms (Census) x Bank	0.249*** (0.016)		
CPA Desert x Bank		-0.149*** (0.027)	
Log CPA Firms x Bank			0.253*** (0.018)
County x Lender Type FE	Yes	Yes	Yes
Lender Type x Year FE	Yes	Yes	
County x Year FE	Yes	Yes	Yes
State x Lender Type x Year			Yes
Observations	86,940	86,940	86,940
Adjusted R2	0.902	0.900	0.917

Table 6: Time Series Evidence

This table models credit originations using Equation (2). The unit of observation is county-lender type-year. The dependent variable in Panel A (B) is *Log Filings (Log Value)*, one plus the log number of UCC filings (log dollar value of equipment financed) that county-year for banks or nonbanks. *Log CPA Firms* is one plus the log number of CPA firms in the county-year. The sample in each column is limited to the years labeled. See Figure 10 for variables definitions. Reported below the coefficients are standard errors clustered at the county level. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

Panel A: Filings

	(1)	(2)	(3)	(4)
	Log Filings			
Log CPA Firms x Bank	0.709*** (0.040)	0.400*** (0.047)	0.415*** (0.042)	0.194*** (0.032)
Log CPA Firms x Nonbank	0.433*** (0.053)	0.253*** (0.068)	0.107** (0.042)	0.008 (0.013)
Period	2000-2004	2005-2009	2010-2014	2015-2019
County x Lender Type FE	Yes	Yes	Yes	Yes
Lender Type x Year FE	Yes	Yes	Yes	Yes
Observations	18,910	18,910	18,910	18,910
Adjusted R2	0.867	0.928	0.947	0.954

Panel B: Equipment Value

	(1)	(2)	(3)	(4)
	Log Value			
Log CPA Firms x Bank	4.476*** (0.212)	3.294*** (0.333)	3.921*** (0.320)	1.698*** (0.234)
Log CPA Firms x Nonbank	2.362*** (0.276)	1.512*** (0.366)	0.714*** (0.268)	0.106 (0.067)
Period	2000-2004	2005-2009	2010-2014	2015-2019
County x Lender Type FE	Yes	Yes	Yes	Yes
Lender Type x Year FE	Yes	Yes	Yes	Yes
Observations	18,910	18,910	18,910	18,910
Adjusted R2	0.663	0.734	0.736	0.736

Table 7: Peer Review Mandates and AFS Collection by Banks

This table models AFS collection by banks using Equation (3). The unit of observation is state-year. The dependent variable in columns 1 and 3 (2 and 4) is *Unqualified (AFS)*, the proportion of financial statements collected by banks that in state-year that are unqualified audits (unqualified audits, reviews, or compilations). *Post Peer Review* is an indicator variable for years after the state adopted a peer review mandate. *Log Avg Borrower Size* is the log of the average borrower sales in the state-year. Sector weights are based on OCC sectors. See Figure 10 for variables definitions. Reported below the coefficients are standard errors clustered at the state level. *, **, *** indicate significance at the two-tailed 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	Unqualified	AFS	Unqualified	AFS
Post Peer Review	-0.045*** [0.017]	-0.034 [0.047]	-0.029* [0.015]	-0.036 [0.045]
Log Avg Borrower Size	0.006 [0.003]	0.016*** [0.005]	0.004 [0.003]	0.013*** [0.004]
Adj R-Sq.	0.301	0.506	0.400	0.536
N	627	627	627	627
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Sector Weight Controls	No	No	Yes	Yes

Appendix A: Risk Management Association Data Description¹

Overview

The Risk Management Association (RMA) is a not-for-profit professional association serving the financial services industry. Its mission is “to advance enterprise-wide risk management in the financial services industry through education, products, and community.” Its membership consists of “1,600+ financial institutions of all sizes, from multi-nationals to local community banks [and] these institutions are represented by over 41,000 individual RMA members located throughout North America, Europe, Australia, and Asia.”

RMA has been publishing the RMA Statement Studies® for over a century and describes it as “a staple credit risk tool for more than 100 years, with historical and comparative financial data of US-based businesses since 1919.” The purpose of these studies is to provide financial institutions (hereafter, banks) with benchmarking data to better understand the financial performance of commercial borrowers and prospects. Data for these studies are collected annually. Each year, RMA begins its campaign to encourage members to participate. Participating banks typically have a deadline of June or July of each year to provide annual financial statements that they have collected from a borrower or prospect from April 1 of the previous year to March 31 of the current year. Historically banks have submitted their financial statements manually (e.g., via mail and fax); however, the predominant form of submission more recently is electronic submission (for example, in 2014, 95% of the financial statements submitted by banks were provided electronically). Several software packages that banks use to analyze commercial loans have a compatible export feature, allowing banks to simply push the “submit” button to create an RMA submission file.

RMA member banks collect financial statements from commercial borrowers in all industries, sizes, and loan grades or risk ratings. However, as quoted from the RMA Handbook, observations will be rejected if any one of the following is not true:

- The fiscal year must fall within the current period—only 12-month fiscal statements falling between 4/1 to 3/31 are acceptable.
- The balance sheet must balance.
- The legal form of the entity must be noted.
- The type of financial statement must be noted.
- A valid NAICS or SIC code must be present. RMA accepts either an SIC code (four-digit) or a NAICS code (six-digit). RMA strongly encourages submission via 2012 NAICS.
- The income statement must be complete.

Importantly, statements are rejected if a valid industry and statement type are not included. This mitigates concerns that industries or statement types classified as “other” are simply picking up “missing” observations. RMA indicates that their credo is “contribute every statement you have,” so they make a concerted effort to have each bank submit their entire portfolio of statements. For the publicly available Annual Statement Studies, RMA truncates firms with assets above \$250 million. For purposes of our study, however, RMA did not eliminate observations with more than \$250 million in assets to provide the best proxy for a bank’s portfolio.

¹ This section quotes frequently from RMA’s homepage (www.rmahq.org) as accessed on March 17, 2023.

The dataset that RMA provided to us is aggregated at the bank-industry-region-borrower size category-year level. The regions include the Northeast, Southeast, Central, South Central, North Central, and West. The size categories include <\$1 million, \$1-\$3 million, \$3-5 million, \$5-\$10 million, \$10-\$25 million, or >\$25 million of revenue.

For each unit of observation, RMA tabulated for us the number of financial statements into one of five mutually exclusive, collectively exhaustive categories—unqualified audit, review, compilation, tax return, and other (see below for additional detail about these statement types)—and the total sales (\$) for all borrowers within the unit of observation.

Several important points and caveats regarding this dataset are worth noting:

- The data are not collected from a random sample of banks. Banks volunteer to participate. To the extent that this creates omitted variable selection bias in the data, we cannot control for this bias; however, the results reported in the paper are robust to including only those banks that participate in each year. Moreover, banks that choose to participate in RMA tend to be larger than banks that do not participate—i.e., these are the more important banks for our study from a generalizability perspective. In most years, at least eight of the 10 largest U.S. banks participate.
- There is no guarantee that the data represent the entire bank portfolios. RMA only “encourages” banks to submit all financial statements. Moreover, banks do not collect any financial statements for a minority of their smallest borrowers (Minnis and Sutherland 2017). However, given the simple electronic submission process and the high correlation between the number of statements individual banks submit to RMA and their commercial lending portfolios as tabulated in Call Reports (Berger, Minnis, and Sutherland 2017), we believe that the RMA dataset is a very reasonable proxy for the banks’ commercial lending portfolios.
- See Tables A1-A4 of the online appendix to Berger, Minnis, and Sutherland (2017) for additional analyses investigating the banks participating in the RMA dataset.

Statement Types

As noted above, RMA tabulates the number of financial statements collected by members into one of five different types: unqualified audit, review, compilation, tax returns, and other. In this section, we describe the process RMA uses to identify the statement types and then describe each of the five statement types.

Process

RMA receives “raw” descriptions of the financial statements that members submit to RMA and then RMA, in turn, maps those raw descriptions into the five financial statement categories. RMA provided to us the complete list of raw financial statement type descriptions reported by members for the 2012, 2017, and 2022 submission cycles. In those years, there were roughly 80 different statement types. The vast majority of these descriptions have obvious mappings into one of the five statement categories and are simply slight iterations from the primary description. For example, in 2022 there are five descriptions for “Compilation”: Compiled, C, COMP, CPA Compiled, and Compilation. Unqualified Audits, Reviews, and Tax Returns categories have similar descriptions and have 5, 5, and 8 different line items, respectively. The remaining 60 descriptions are classified as “Other” by RMA. We describe the statement types in more detail below.

Unqualified Audit

A financial statement audit provides positive assurance that the financial statements are reported in accordance with Generally Accepted Accounting Principles. An unqualified audit opinion indicates that the auditor believes that the financial statements are materially in accordance with GAAP. Unqualified audited financial statements are accompanied by complete footnote disclosure, providing the most complete set of information of all of the statement along with the highest level of assurance and no detected material deviations from GAAP.

Review

Financial statement reviews provide negative assurance. An independent accountant performs analytical procedures (e.g., ratio analyses) and interviews management to assess whether the financial statements are misstated; however, the accountant does not perform substantive procedures to obtain positive evidence of an account balance. Reviews are generally accompanied by complete footnote disclosure; therefore, reviewed financial statements provide a similar information set to unqualified audits, but the information has a significantly lower level of assurance, reporting quality, and cost.

Compilation

A compilation provides no assurance about the financial statement balances reported in the financial statements. An accountant puts the firm's financial information in the form of financial statements but performs no procedures and provides no assurance as to the reporting quality. Compilations include all three standard financial statements, but are not required to report (and generally omit) footnote disclosures. Therefore, compilations provide substantially less assurance and information than either audits or reviews.

Tax Return

All firms are required to file a tax return with the Internal Revenue Service (IRS) annually. The nature of these returns differs by entity type (e.g., C Corporation, S Corporation, or Limited Liability Company) and entity size (e.g., firms with less than \$250,000 in assets are not required to complete Schedule L which is a balance sheet). While all firms follow "tax basis" accounting to complete the form, the tax basis may differ based on firm size and various options that firms are able to elect (e.g., accrual versus cash basis; differing depreciation options, etc.). Therefore, even within the tax basis of accounting, the differing forms and various options result in heterogeneity. The focus of tax returns is the income statement, but firms with more than \$250,000 of assets also must provide a balance sheet. Important omissions from tax returns include both the statement of cash flows and financial footnotes. Moreover, while independent accountants are frequently involved in the production of these statements, they generally do not provide assurance about them. However, the IRS serves an implicit monitoring role, though the vast majority returns are not audited on an annual basis by the IRS. Collectively, tax returns provide useful but limited financial information and have some, but weaker (and implicit) verification.

Other

The "Other" category captures all statements that are not one of the above. Based on our analysis of the detailed statement type descriptions provided to us by RMA, the overwhelming majority of "Other" are company prepared financial statements. Various iterations of "Company Prepared" represent nearly 80% of the financial statements in this category. Company prepared financial statements are those prepared internally by management and provided to the bank

without the involvement of an external accountant. The fact that company prepared comprises the bulk of this category is consistent with discussions with RMA. Moreover, they have indicated that this description has appeared more frequently over time. The remaining set of financial statement types can be essentially grouped into one of three categories: (i) some form of phrasing such as “other” or “unaudited” (representing just over 5% of the “Other” category in 2022); (ii) some form of “qualified audit” (representing just under 5% of the “Other” category); (iii) a variety of other descriptions, such as “TTM” or “Trailing 12 Mo.” or “ROLL STMT”.²

The vast majority of the financial statements classified as “Other” suggest this category identifies the variation we are attempting to measure: financial statements not prepared by independent CPA firms, and, specifically instead, prepared by management. The one exception are those statements identified in some manner as “Qualified audits.” Qualified audit reports are audits similar to “unqualified” audit reports described above but a qualification was made regarding some aspect of the financial statements. For example, the company prefers not to follow a particular accounting rule, so the independent accounting firm provides an “except for” opinion which states that the financial statements follow GAAP except for this aspect. Historically, RMA reported qualified statements as a separate category, but because this category was infrequently used, RMA began consolidating it with “other” (including for the full time period of the data we use in our paper). Our analyses of the 2012, 2017, and 2022 raw financial statement type descriptions indicate qualified statements comprise a constant share (roughly 5%) of “other” statements, thus playing no meaningful role in explaining the AFS decline. In sum, company prepared financial statements make up the overwhelming majority of financial statements in the “Other” category.

² We also note that a very small number of financial statements in the “Other” category have the description of “10-K” or “10-Q”. Given that at least the 10-K financial statements would be audited, this could be concerning, but the entirety of the financial statements collected with this description represent less than 0.1% of financial statements classified as “Other.”