



# MIT Open Access Articles

## *Financial Statements as Monitoring Mechanisms: Evidence from Small Commercial Loans*

The MIT Faculty has made this article openly available. **Please share** how this access benefits you. Your story matters.

<b>Citation</b>	Minnis, Michael and Sutherland, Andrew. "Financial Statements as Monitoring Mechanisms: Evidence from Small Commercial Loans." <i>Journal of Accounting Research</i> 55, no. 1 (August 2016): 197–233 © 2016 University of Chicago on behalf of the Accounting Research Center
<b>As Published</b>	<a href="http://dx.doi.org/10.1111/1475-679x.12127">http://dx.doi.org/10.1111/1475-679x.12127</a>
<b>Publisher</b>	Wiley Blackwell
<b>Version</b>	Author's final manuscript
<b>Citable link</b>	<a href="http://hdl.handle.net/1721.1/109261">http://hdl.handle.net/1721.1/109261</a>
<b>Terms of Use</b>	Creative Commons Attribution-Noncommercial-Share Alike
<b>Detailed Terms</b>	<a href="http://creativecommons.org/licenses/by-nc-sa/4.0/">http://creativecommons.org/licenses/by-nc-sa/4.0/</a>

Working Paper No. 115

Booth Working Paper Series No. 13-75

**Financial Statements as Monitoring Mechanisms:  
Evidence from Small Commercial Loans**

**Michael Minnis**

University of Chicago Booth School of Business

**Andrew Sutherland**

University of Chicago Booth School of Business

Initiative on Global Markets

The University of Chicago, Booth School of Business

*“Providing thought leadership on international business, financial markets and public policy”*

# **Financial Statements as Monitoring Mechanisms: Evidence from Small Commercial Loans\***

**Michael Minnis<sup>+</sup>**

University of Chicago Booth School of Business

**Andrew Sutherland**

MIT Sloan School of Management

**May 2016**

---

\* Accepted by Christian Leuz. We thank Brad Badertscher, Douglas Baird, Ray Ball, Phil Berger, Hans Christensen, Douglas Diamond, Joao Granja, Bjørn Jørgensen, Anil Kashyap, Russell Lundholm, Edward Morrison, Valeri Nikolaev, Stephen Ryan (discussant), Nemit Shroff, Stephanie Sikes, Douglas Skinner, Abbie Smith, Ross Watts, Joseph Weber (discussant), Regina Wittenberg-Moerman, two anonymous referees, and the participants at the Colorado Summer Accounting Research Conference, FARS Midyear Meeting, Goethe University, London Business School, and London School of Economics for helpful comments. We are extremely grateful to Sageworks, Inc. for providing the data for this project, and particularly to Tim Keogh for providing assistance. Any errors or omissions are our own. Both authors gratefully acknowledge financial support from the University of Chicago Booth School of Business and the Initiative on Global Markets. Minnis also acknowledges support from the ARAMARK Faculty Research Fund. Sutherland acknowledges support from the Ernie Wish Fellowship. The data used for this project are proprietary, but the authors are willing to provide code to researchers with access to this data. An Online Appendix to this paper can be downloaded at <http://research.chicagobooth.edu/arc/journal-of-accounting-research/online-supplements>.

<sup>+</sup> Corresponding author: Michael.Minnis@chicagobooth.edu; 773.834.5965.

# Financial Statements as Monitoring Mechanisms: Evidence from Small Commercial Loans

## Abstract

Using a dataset which records banks' ongoing requests of information from small commercial borrowers, we examine when banks use financial statements to monitor borrowers *after loan origination*. We find banks request financial statements for half the loans and this variation is related to borrower credit risk, relationship length, collateral, and the provision of business tax returns, but in complex ways. The relation between borrower risk and financial statement requests has an inverted U-shape; and tax returns can be both substitutes and complements to financial statements, conditional on borrower characteristics and the degree of bank-borrower information asymmetry. Frequent financial reporting is used to monitor collateral, but only for non-real estate loans and only when the collateral is easily accessible to lenders. Collectively, our results provide novel evidence of a fundamental information demand for financial reporting in monitoring small commercial borrowers and a specific channel through which banks fulfill their role as delegated monitors.

*JEL Classification:* G21; G24; G32; G28; H25; H32; M40; M41

*Keywords:* Loan monitoring; financial contracting; collateral; debt contracts; relationship lending; tax returns; credit risk; banks.

## 1. Introduction

When do banks use financial statements to monitor small commercial borrowers? In serving as delegated monitors, banks privately collect information from firms in order to discipline borrowers' investment decisions and protect any proceeds in case of default. While banks may prefer firms provide financial statements throughout the term of the loan, financial reporting is costly and substitute monitoring mechanisms are available (Cassar, Cavalluzzo, and Ittner [2015]). In this paper, we empirically examine when banks use financial statements to monitor borrowers using a proprietary dataset of small commercial loans. The dataset includes not only loan contract terms (e.g., maturity, interest rate, amount, presence of collateral), but also the documents that banks request from the borrowers after the loan has been originated (e.g., financial reports, tax returns, and other non-financial information). We find that, although financial statements are the most requested document type in the dataset, banks use them to monitor small commercial borrowers for only half the loans in the sample. We model this variation in ongoing financial statement requests as a function of the bank-borrower relationship, borrower risk, use of collateral, business tax return collection, non-financial information, and other loan terms to better understand what factors are associated with the use of financial statements in the ongoing monitoring of borrowers.

We motivate our analysis using theoretical frameworks which offer competing predictions for when banks and borrowers would agree to use financial statements. For instance, the relation between a borrower's risk and financial statement provision is not straightforward. On the one hand, ongoing financial reporting may be more beneficial for high-risk borrowers because commitments to higher levels of monitoring allow them to access credit (e.g., Jensen and Meckling [1976]; Watts [1977]). On the other hand, low-risk firms could be more likely to

produce financial statements and provide them to lenders on an ongoing basis to portray themselves as high quality borrowers. Still other theories indicate the relation between a borrower's risk profile and the use of financial reporting is more complex and, in fact, non-monotonic (e.g., Diamond [1991]).

Alternative financial information sources and monitoring mechanisms are also prevalent, but the extent to which these alternatives serve as substitutes for financial reporting is unclear. For example, tax returns are an important source of financial information which firms are required to produce annually for the IRS. However, prior research has been unable to directly examine how or when tax returns mediate the usefulness of financial statements. Whereas tax returns are natural substitutes for financial statements because of overlapping information, recent findings suggest tax reports can complement financial statements because of the implicit monitoring role of the IRS (e.g., Hanlon, Hoopes, and Shroff [2014]). How financial reporting interacts with collateral is also unclear, a priori. The evidence in Bester [1987] suggests collateral reduces the need for financial statement monitoring, but the analysis in Rajan and Winton [1995] suggests the use of collateral enhances the demand for financial statements to monitor the existence and condition of pledged assets.

Collectively, theoretical arguments produce a variety of predictions for when financial statements will be used as monitoring mechanisms in debt contracting. We distill the theoretical framework into three specific research questions to structure our empirical analyses: (1) How is borrower credit risk related to the propensity for banks to use borrower financial statements? (2) Are financial statements and collateral substitute or complement mechanisms? (3) How do tax returns relate to the use of financial statements?

We investigate these research questions in the setting of small commercial loans. In this

setting banks and borrowers address information asymmetry problems exclusively through private reporting channels, rather than public disclosures (Diamond [1984], Fama [1985], Diamond [1991]; Rajan and Winton 1995]). Examining private information channels isolates the reporting motives related to the credit relationship, compared to public voluntary disclosure decisions which also take into consideration the reactions of competitors, suppliers, employees, and others.<sup>1</sup> Moreover, the lack of a regulatory mandate in this setting allows us to better isolate a market-driven equilibrium of financial reporting. We present three main empirical results.

First, we find banks collect financial statements more frequently from borrowers with middle-tier credit risk relative to borrowers with either high or low credit risk. This finding is consistent with the intuition of Diamond [1991]. Diamond suggests that *low*-risk borrowers require little monitoring because their positive reputation allows them to “have a lower cost of capital, and such a rating needs to be maintained to retain this source of higher present value of future profits.” As such, “these high-rated borrowers do not need monitoring” (pg. 690). By contrast, monitoring is ineffective for *high*-risk borrowers. According to Diamond, they have “less to lose if they reveal bad news about themselves by being caught when monitored. As a result, monitoring will not provide incentives for these very low rated borrowers” (pg. 690-691). Middle-tier borrowers, on the other hand, will undertake risky projects if not monitored, but have sufficient reputation that monitoring provides incentives not to do so. These arguments suggest that financial statement monitoring is most beneficial for middle-tier borrowers. In non-parametric tests, we find banks request financial statements least frequently from borrowers in the top and bottom quintiles of credit spread (our proxy for borrower credit risk) and about 25%

---

<sup>1</sup> Privately held firms are not the only setting where private monitoring can be studied, however. Recent research also uses the setting of public firms by examining the extent and type of private communications agreed upon between borrower and lender in the publicly available contractual agreements (e.g., Frankel et al. [2011]; Carrizosa and Ryan [2016]).

more frequently from borrowers in the middle quintile. This finding persists after we control for a variety of loan contract terms, bank, time, loan type, and industry fixed effects.

We also consider the endogeneity issue that credit spread is simultaneously determined with other contract features, including the provision of ongoing financial reporting. In alternative specifications that take into account the simultaneous choice of several loan contract features, we continue to find an inverted U-shape between borrower credit risk and financial reporting. This evidence suggests the relation between financial reporting and credit risk in the setting of small firm debt financing is non-monotonic rather than linear as typically modeled in the literature (e.g., Allee and Yohn [2009]; Minnis [2011]; Cassar et al. [2015]; Kausar, Shroff and White [2016]).

Second, we examine the relation between the requests for financial statements and the provision of collateral. Theory broadly offers competing predictions for the relation between collateral and monitoring. On one hand, collateral can reduce the lender's need to undertake costly monitoring because it offers protection in the event of default (Bester [1987]; Berger and Udell [1990]). On the other hand, collateral creates incentives for the lender to monitor to ensure its value (Rajan and Winton [1995]; Boot [2000]; Sufi [2007]; Göx and Wagenhofer [2009]). To examine the empirical relation between financial report requests and collateralization, our initial tests regress financial statement requests on the presence of collateral and other loan terms. These tests do not reveal a significant relation between collateral and financial statement requests. However, the existence and value of a firm's collateral can change quickly, creating a demand for more timely information (GE Capital Commercial Finance [1999]; Contino [1996]). Therefore, we reexamine the relation between financial statement monitoring and collateral after conditioning on the frequency of the financial report requests (e.g., Leftwich, Watts, and



Zimmerman [1981]). When the dependent variable in the regressions is limited to financial statement requests made more frequently than annually (e.g., quarterly or monthly), we find a positive relation between financial statement requests and collateral, consistent with theories suggesting that banks use interim financial reports to monitor collateral.

While we find that interim financial statements and collateral are positively correlated, the inference that banks use interim financial statements to monitor collateral could be incorrect because the positive relation could be driven by an omitted variable. In particular, borrowers with some unobservable characteristic could be more likely to both provide frequent financial reports and offer collateral. To mitigate this omitted variable concern, we use state-level foreclosure and repossession laws to measure the degree to which states are borrower- versus lender-friendly with respect to collateral recovery. We find the positive relation between interim financial requests and collateral present only in low recovery barrier (i.e., “lender-friendly”) states. In other words, banks are more likely to request financial statements in conjunction with collateral in those states where collateral is easily accessible to the lender, and therefore more beneficial to monitor. Collectively, these results provide evidence of a *complementary* role of financial reporting and collateral in debt contracting.

In our last set of tests, we consider how the availability of substitute information from tax returns is related to a bank’s requests for financial statements. A common refrain among standard setters and academics is that financial statements are less beneficial for monitoring privately held firms because banks have access to alternative data sources, such as tax returns which report income statement and balance sheet related items (Berger and Udell [2006]; Botosan et al. [2006]; FAF [2011]). Recent criticisms of the complexity of Generally Accepted Accounting Principles (GAAP) note a substitute role, and speculate borrowers are increasingly opting to

provide their lender with tax returns *in lieu of* financial statements (FAF [2011]). By contrast, academic research hypothesizes and finds evidence that the IRS serves as an implicit monitor of financial information, thus suggesting a *complementary* verification role of tax returns for financial statements (Hanlon, Hoopes, and Shroff [2014]).<sup>2</sup>

We find that when a bank requests a tax return, the propensity for the bank to request a financial statement is 9% lower. Cross-sectional tests reveal this negative relation is more (less) prevalent when firms have significant intangible assets (assets in place) suggesting that financial reports are particularly useful or less costly to produce vis-à-vis tax returns when a firm has physical assets. Moreover, we find the propensity for a bank to request *both* financial statements *and* tax returns is increasing when information asymmetry between the bank and borrower is most salient: when the bank-borrower relationship is shorter, when the amount of non-financial information the bank collects is higher, or when the borrower has a middle-tier credit risk. Thus, while tax returns are generally substitute sources of financial information, they play an important complementary role to financial statements in monitoring borrowers when information problems are particularly severe.

Our paper contributes to the empirical literature examining the use of financial information in debt contracting with small commercial borrowers (e.g., Allee and Yohn [2009]; Minnis [2011]; Cassar et al. [2015]; Sutherland [2016]). In contrast to this prior work, we explicitly examine the ex-post monitoring role of financial information. We find the relation between financial reporting, borrower characteristics, and alternative mechanisms is not linear as

---

<sup>2</sup> Informal interviews with bankers support both perspectives. The bankers suggest tax returns provide basic financial information and therefore can serve as substitute financial monitoring mechanisms. However, because tax returns have only basic balance sheets and do not have statements of cash flows, financial statements are generally more informative, limiting the substitute role. Supporting the complement perspective, the bankers suggested to us that IRS monitoring and unconditional conservatism (i.e., owners prefer reporting low taxable income) of tax returns make them useful to confirm information reported in financial statements.

typically modeled, but instead more complex and often nonlinear depending on the type of mechanism considered, the financial reporting frequency, the information environment between the bank and borrower, and borrower risk.

We also offer evidence relevant to the debate surrounding financial reporting standards for private firms. A Financial Accounting Foundation (FAF) study claims users (banks, in particular) and preparers view financial reporting as not surpassing a cost-benefit threshold, suggesting financial reporting can be unnecessary because banks have direct access to management after loan origination (FAF [2011]).<sup>3</sup> As a result, the FAF initiated the Private Company Council to propose exceptions to GAAP for privately held firms. Based in part on this report, the American Institute of Certified Public Accountants (AICPA) developed a new set of accounting standards for private firms (AICPA [2013]).<sup>4</sup> While our paper does not resolve this debate, we contribute new empirical insights about how frequently banks find financial statements cost-beneficial for monitoring borrowers and the manner in which alternative information sources and contracting mechanisms substitute for reporting.

Finally, our paper contributes evidence on the theoretical role of banks as delegated monitors (Diamond 1984; Fama 1985). Whereas substantial empirical literature *infers* that banks serve as monitors (e.g., Booth [1992]; Purnanandam [2011]; Wang and Xia [2014]), only recently has research investigated the specific mechanisms banks use to fulfill this role (Mester,

---

<sup>3</sup> The American Institute of Certified Public Accountants (AICPA), Financial Accounting Foundation (FAF), and National Association of State Boards of Accountancy (NASBA) created the Blue Ribbon Panel on Standard Setting for Private Companies and concluded, “There are urgent and growing systemic issues that need to be addressed in the current system of U.S. accounting standard setting” for private firms (FAF [2011], pg. 1). These concerns are not new (see Botosan et al. [2006] for a review and also see Bradshaw et al. [2014] for additional discussion of the debate).

<sup>4</sup> The main issue in the debate is whether financial reporting standards (i.e., U.S. GAAP) are appropriate for privately held firms. Both sides of the argument essentially point to efficiency issues: under one view, U.S. GAAP is inefficient for private firms (e.g., GAAP financial statements are not cost-beneficial mechanisms for use between banks and private firm borrowers); under the alternative argument, a regime with two separate GAAPs is inefficient (e.g., banks will find it costly to receive reports under multiple GAAPs). The purpose of our paper is to provide empirical evidence on the fundamental forces related to banks’ use of financial statements, which may inform the debate.

Nakamura, and Renault [2007]; Frankel et al. [2011]; Beatty, Liao, and Weber [2012]; Carrizosa and Ryan [2016]). We contribute to this literature by examining a specific mechanism through which banks collect private information—borrower financial reporting. These findings provide new insights on the use of various borrower monitoring mechanisms and how these mechanisms interact as complements or substitutes for monitoring small commercial borrowers.

Although we conduct a range of robustness tests to confirm our main findings, we are cautious in interpreting our results for several reasons. First, our dataset is not collected from a random sample of banks, but rather from banks which decided to purchase the system we used to generate the dataset, potentially limiting the generalizability of our findings. The dataset also does not track firms over time or report loan outcomes, preventing us from examining relationship dynamics or the effectiveness of financial monitoring to influence outcomes. Moreover, although the dataset contains important details with respect to what documents banks request from borrowers, it is far from comprehensive and is limited on other details such as collateral descriptions, borrower characteristics or the accounting method (e.g., GAAP basis) and verification level (e.g., audit) of the requested financial statements.

## **2. Theoretical Framework and Prior Research**

Since Diamond [1984], both theoretical and empirical research has asserted that a primary role of banks is to serve as a delegated monitor of borrowers (see Freixas and Rochet [2008] and Degryse, Kim, and Ongena [2009] for overviews). Monitoring disciplines the borrower's behavior and allows the bank to take appropriate action in the event of a negative outcome, increasing the expected cash flows from the loan. Monitoring has two necessary components: information collection about borrower actions and performance, and contractual mechanisms to take action on this information. Without the former, the bank does not know

when to take action; without the latter, the bank is unable to take action.

The contractual mechanism the debt contracting literature commonly studies is covenants (Smith and Warner [1979]; Armstrong et al. [2010]). Covenants include performance “trip wires” in the form of affirmative (e.g., insurance maintenance, financial performance ratios, and reporting requirements) and negative (e.g., limits to dividends or capital expenditures) provisions that specify when control shifts to the lender. For small commercial loans, the shift in control provisions typically relies on observable borrower actions such as requests for payment deferral or contract provisions that allow the bank to call the loan with sufficient notice.<sup>5</sup> With legal provisions established, the bank needs information to assess borrower performance and to know when (and how) to take action. The information mechanisms that banks use are generally less well specified but include sources such as relationships and financial statements. We are interested in understanding when financial statements play a beneficial role in monitoring small commercial borrowers.

Prior research highlights multiple roles for financial reporting as a monitoring device after loan origination (see Armstrong et al. [2010] and Christensen, Nikolaev, and Wittenberg-Moerman [2015]). First, financial monitoring can constrain the borrower’s moral hazard problems because discovery of risky investments jeopardizes their future credit access. As a result, financial statement monitoring reduces the likelihood of negative loan outcomes because borrower actions are less risky. Second, in the event of an adverse outcome (e.g., a borrower request to defer payment) proactive collection of financial reports helps inform the bank whether such outcomes are arising from temporary liquidity issues that warrant flexibility, or more

---

<sup>5</sup> The dataset researchers commonly use to study small borrowers (Survey of Small Business Finance) includes hundreds of questions, but none related to financial ratio covenants. Our dataset includes only minimal mention of financial ratios. According to discussions with bankers, financial ratio covenants are not as common in this setting because they require high quality financial statements (likely audited), constant calculation and review, and regulatory scrutiny when tripped.

serious problems that warrant calling the loan. Renegotiations also arise frequently during the course of the loan (Roberts and Sufi [2009]), and the bank can better respond to these events if it has been collecting ongoing financial information about the borrower.<sup>6</sup> Finally, in the event of default, the bank can recover proceeds by selling any pledged collateral. Financial reports can provide relevant information about, and discourage misappropriation of, these assets. Collectively, monitoring borrowers through financial statements can benefit a bank's cash flow realizations after loan origination. In this section, we discuss in more detail various theories which provide a framework for our research questions and motivate our empirical investigation.

### *2.1 Relationships, Borrower Reputation and Risk*

Financial statements enable banks to learn about the borrower's investment decisions and performance over time (Jensen and Meckling [1976]; Watts [1977]). As banks learn about borrowers and borrowers establish credit reputations, ongoing performance reporting—a key component of reputation acquisition models—becomes less beneficial (Diamond [1989]). Therefore, these theories predict that financial statement requests decrease monotonically in the length of the bank-borrower relationship.

The predicted relation between financial statement monitoring and borrower risk, however, is not as straightforward. For instance, models based on agency theory suggest high-risk borrowers commit to providing financial reports to gain access to financing, thus predicting a positive relation between ex-post financial monitoring and borrower risk. By contrast, sorting models in which banks partition borrowers by offering a menu of contracts (e.g., Bester [1985]; Besanko and Thakor [1987]; Dell'Ariccia and Marquez [2006]) suggest a negative relation

---

<sup>6</sup> Even in the setting of public firms with high quality financial reporting, research indicates financial ratio covenant issues are responsible for only 18% of debt renegotiations, suggesting alternative mechanisms besides financial ratio covenants play an important role (Roberts and Sufi [2009]).

between borrower type and financial reporting. These models suggest low-risk firms will be willing to subject themselves to ongoing monitoring to receive better terms, whereas high-risk firms prefer a contract with lower monitoring (or cannot mimic the financial reporting regime) and less favorable terms in other dimensions of the loan contract.

In contrast to either of the two monotonic predictions between financial monitoring and borrower risk, Diamond [1991] analytically examines the disciplinary role of banks, and argues the usefulness of ex-post monitoring is non-monotonic across the distribution of borrowers' credit risks. In particular, the model predicts an inverted U-shaped relation between credit risk and costly monitoring activity. Low-risk borrowers possessing longer track records without default require little monitoring because they want to protect their earned reputations. A high reputation ensures access to less costly and more abundant credit in the future, and firms' desire to maintain a high reputation disciplines their investment decisions today.

Borrowers that the bank perceives as high-risk (either because the firms lack a track record or have a history of default) do not have a positive reputation to lose. These borrowers are willing to take the chance that financial reporting to the bank will reveal their risky investments and will continue to undertake them—i.e., even in the presence of monitoring, high risk firms have incentives to make suboptimal investments from the perspective of the lender. For firms with middle-tier credit risk, on the other hand, ongoing financial monitoring disciplines the borrower's actions and provides useful information to the bank in anticipating performance deterioration, renegotiation events, and payment defaults. Middle-tier borrowers have sufficient reputations to limit the risky investment behavior, yet their reputation is not sufficient to be trusted to make the proper investment choice in the absence of monitoring.<sup>7</sup>

---

<sup>7</sup> Diamond [1991] formally proposes his model as a way of explaining firms with publicly traded (i.e., unmonitored) debt, bank (i.e., monitored) debt, and credit rationing. We rely on this model to explain the relative levels of

Financial statement monitoring not only disciplines borrower behavior, but also provides valuable information in the event of a payment deferral request or renegotiation.<sup>8</sup> Because banks and borrowers must agree to the schedule of ongoing financial statement monitoring at the time of loan origination, and because producing, requesting and collecting financial statements is costly, banks need to anticipate for which borrowers the financial information will be most valuable. For low-risk borrowers, situations such as payment deferral requests are anticipated to be infrequent. For high-risk borrowers, payment deferral requests are more likely to indicate negative states of the world where the optimal outcome is for the bank to call the loan without additional consideration. In both cases, from an *ex-ante* perspective financial statement requests are costly and have little expected benefits. By comparison, decisions for middle-tier borrower requests are the most difficult and historically collected financial information (which reveals current performance trends and longer term seasonality trends) can be particularly valuable. Thus, this “information expectation hypothesis” predicts an inverted U-shaped relation between borrower credit risk at loan origination and financial statement monitoring, consistent with Diamond [1991].

## 2.2 Collateral

Collateral serves two theoretical roles after loan origination in debt contracting: it disciplines a borrower to reduce risky activities *ex-ante* to avoid losing the asset in default, and it compensates the bank in the event of default. These roles produce conflicting predictions for the

---

monitoring *within* the bank debt setting. One reason why the small business loan market is an interesting setting to consider the Diamond model is that regardless of how high a reputation these small firms have, their loan size does not meet the scale necessary for publicly traded debt. Therefore, we expect to see borrowers with high credit ratings within the bank market. This also suggests that the inverted U shape would not be found in public debt markets because these firms have sufficient reputation that they are all located on the ‘downward’ slope of the relation (e.g., Carrisoza and Ryan [2016]).

<sup>8</sup>This discussion is based on the incomplete contracting literature (Armstrong et al. [2010]; Christensen et al. [2015]), commercial banking literature (e.g., Gup and Kolari [2005]; Berger and Udell [2006]), and our interactions with commercial bankers.



relation between the provision of collateral and ongoing financial monitoring. On one hand, because collateral pledges are themselves monitoring mechanisms (by disciplining borrower behavior), and because they protect the lender in the event of default, they reduce the need for costly information collection activities over the term of the loan (Bester [1987]; Berger and Udell [1990]). This substitution hypothesis predicts banks will make fewer requests for financial statements from their borrowers if collateral is part of the loan contract.

On the other hand, in Rajan and Winton's [1995] model, collateral creates an incentive for the bank to monitor the borrower *more* closely to preserve the expected proceeds from asset liquidations in the event of default. A role of the balance sheet is to provide information about the existence and (lower-bound) value of pledged assets, suggesting financial statements will be beneficial to lenders monitoring collateral (Sufi [2007]; Göx and Wagenhofer [2009]). Consistent with this notion, asset-based lending guides highlight the relevance of financial reports to track collateral.<sup>9</sup> However, the informativeness of the balance sheet is contingent on the timeliness with which the lenders receive the financial statements. Collateral is useless in the event of default if its value has significantly deteriorated or the managers have absconded with it. Prior research finds that interim financial reports (those which occur more frequently than annually) allow principals to monitor with a more precise signal (Leftwich, Watts, and Zimmerman [1981]), suggesting frequency is an important attribute to consider when examining the use of financial reporting in monitoring collateral.

Moreover, collateral is not homogenous, and the usefulness of financial reports will

---

<sup>9</sup> For example, "*ongoing* monitoring of the collateral helps to maintain a business relationship on a basis that benefits both borrower and lender. 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], emphasis added). In equipment leasing markets, "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" (Contino [1996], emphasis added).

depend on the type of asset pledged. For example, some assets such as real estate are easily observable by those outside the firm and cannot be pledged to another lender without a public filing. As a result, timely financial reports are less useful in informing lenders about the condition, existence, and ownership of real estate, especially considering the availability of public title information, appraisals, comparable transactions, and real estate indices that relate more to local economic conditions than to firm specific performance. In sum, the relation between collateral and the usefulness of financial statements as monitoring mechanisms is unclear theoretically and is conditional on the intensity of financial reporting and the nature of the collateral.

### *2.3 Tax Returns as Alternative Information Sources*

Prior research also suggests an uncertain role of financial statements in loan monitoring because alternative information sources in the small commercial loan setting are prominent (see Berger and Udell [2006] for a discussion). For example, Cassar et al. [2015] find that credit scores reduce the usefulness of accrual accounting in loan origination decisions. An additional important source of financial information apart from financial statements is a firm's tax returns (FAF [2011]). Firms report sales, expenses, assets, and liabilities in their tax returns, and because this information is required annually by the IRS, it can be considered a relatively low cost substitute for financial statements. However, it is not obvious that firms will always provide tax returns to their bank, or that tax returns will necessarily substitute for financial statements for monitoring purposes. Tax returns do not include cash flow statements, the balance sheets are not detailed, and the returns are not timely. Moreover, if firm owners consider tax returns personal information, then they may prefer not to provide them to the bank. As such, the ability for tax returns to substitute for financial statements in monitoring borrowers—even though all firms

produce tax returns—is an empirical question.<sup>10</sup>

While tax returns provide overlapping information to financial statements, the IRS also serves as an implicit monitor of the information on the tax return. For example, Hanlon, Hoopes, and Shroff [2014] find that this implicit monitoring disciplines a firm’s financial reporting. Considering the typical U.S. private firm does not have their financial statements audited (Allee and Yohn [2009]; Minnis [2011]; Lisowsky and Minnis [2015]), this verification role could be particularly relevant in our setting. When the bank is less certain about the borrower or monitoring is particularly cost-beneficial, they can request *both* financial statements and tax returns—matching the higher information content of financial statements to the implicitly monitored results of the tax returns.<sup>11</sup>

Additionally, the informativeness of a borrower’s financial statements to a lender will likely influence the tradeoff between financial statements and other information sources (Ball, Bushman, and Vasvari [2008]), such as tax returns. Verifying the value of intangible assets can be difficult, and creditors typically recover little from such assets in default (Watts and Zimmerman [1983]; Kothari, Ramanna, and Skinner [2010]).<sup>12</sup> Moreover, reporting and auditing

---

<sup>10</sup> Our interviews with bankers and firm owners revealed these various tax return tradeoffs. These discussions suggested, while tax returns are frequently collected at the loan initiation decision, their usefulness as an ongoing monitoring mechanism is less clear and that owners receive negative utility to providing business tax returns. Also note that only firms with more than \$250,000 in assets are required to report balance sheet items on the tax return. Unfortunately, we do not observe firm size in our dataset so are unable to exploit this threshold.

<sup>11</sup> For example, in a survey conducted by the Financial Executives Research Foundation (FERF) one banker stated: “We will often use tax returns to confirm certain information that we will not see from looking at GAAP statements alone. Tax returns become another level of verification or assurance, like audited financial statements” (FERF [2006], pg. 16). Bankers also suggested to us that they view tax returns as unconditionally more conservative compared to financial reporting, and therefore view taxable income as a useful conservative level of financial performance. The role of tax reporting as a complement to financial reporting contrasts with the view articulated in Burgstahler, Hail, and Leuz [2006]. Those authors find that, in countries in which tax authorities tightly base tax income on book income, private firms are more likely to manipulate their earnings. Thus, tax reporting can make book reporting less informative. However, that view applies in the European setting for firms in which auditing is mandated and, thus, the potential complementary role for tax authorities as verifiers is muted.

<sup>12</sup> For example, Kothari, Ramanna, and Skinner [2010] state, “management-supplied estimates of the value of such intangibles are difficult to verify, and for contracting and monitoring purposes, their inclusion is of limited use. In contracting, these exclusions are justifiable because it is unclear that these items could be used to satisfy creditors’

intangible assets is seen as particularly costly for smaller firms because of annual impairment testing, for example (FAF [2011]).<sup>13</sup> By contrast, tax accounting uses less costly historical valuation and amortization of intangibles. Given the potentially limited usefulness of intangibles in debt contracting, therefore, financial statements are less likely to meet the cost-benefit threshold vis-à-vis tax returns if the firm has higher intangible assets relative to tax returns.

### **3. Setting and Data**

To examine our research questions concerning banks' use of financial statements as a mechanism to monitor borrowers, we use a dataset provided by Sageworks Loan Administration (SLA).<sup>14</sup> SLA is an online database platform that helps banks monitor loans in their portfolio. Upon entering loan terms into the system, banks schedule future document requests, including a description of the document and frequency (e.g., annually, quarterly, monthly). The SLA platform allows banks to create customized reports, such as a list of upcoming or overdue requests. Diamond [1984] envisions a delegated monitoring role for banks because of scalable technologies such as the SLA.

The main source of innovation in this dataset for empirical research is the record of private document requests by the bank to the borrower. For each request, the dataset reports a description of the document and the date, frequency, and method by which the document is expected to be collected. In total, banks make more than 90,000 information requests from

---

claims given uncertainty about both their future economic benefits and/or whether property rights are sufficiently well-defined as to establish legal rights over these items" (pg. 261).

<sup>13</sup> Because Kothari, Ramanna, and Skinner [2010] speak more broadly of larger, public firms, it is useful to highlight that these issues are also relevant to smaller firms. As one example, the Financial Accounting Foundation report stated that smaller CPA firms (those with fewer than 5 partners) have "generally agreed that the cost of preparing GAAP financial statements has increased compared to the perceived benefits" and specifically pointed to goodwill impairment testing and acquisition accounting as examples of financial reporting issues which create cost-benefit concerns (FAF [2011], pg. G-9).

<sup>14</sup> See the accompanying online appendix for additional discussion of the SLA dataset and the small commercial loan setting—including types of loans, borrowing purposes, and various lending mechanisms.

borrowers across 697 unique document descriptions in our final sample. We manually code all requests and group them into several categories in Table B1 of the online appendix. The most frequently requested item is business financial statements, followed by tax returns, proof of insurance, and information about the owner's personal wealth. The dataset also provides important loan terms: amount, origination date, interest rate, fixed or variable rate, maturity, and whether it is collateralized. Appendix A provides variable definitions. A loan-type code denotes whether the loan is a commercial and industrial (C&I) loan or a commercial real estate (CRE) loan. A borrower 6-digit NAICS industry code is reported for 43% of the observations.

In Table 1, Panel A we report that our initial sample contains 9,290 business loans. We eliminate loans missing the contract terms or correspondence requests used in our main tests. Our final sample contains 4,518 loans made from 35 banks to 3,148 borrowers.<sup>15</sup> Although SLA was launched in 2010 and we received the data in late 2012, 39% of our loans originated prior to 2010. Table 1, Panel B presents the descriptive statistics for each of the variables for the 4,518 loans that we analyze after truncating continuous variables at the 1% level in both tails.<sup>16</sup> Banks request financial statements for 51% of the loans in the sample. We use the collection frequency field to determine which requests are for annual versus interim financial statements, and find that 24% of financial statement requests are for interim statements.<sup>17</sup> Because SLA does not record

---

<sup>15</sup> We drop 947 loans because they did not contain any information in the correspondence file under the assumption that zero correspondence is measurement error as a result of a few banks newly installing the SLA platform before we received the data. Two banks are responsible for 80% of the no-correspondence loans. However, these observations could be interpreted as actually having zero correspondence. As shown in online appendix Table B3, our inferences are unchanged if we do not condition the sample on having at least one correspondence item or if we drop the observations from the two banks with the most missing correspondence loans.

<sup>16</sup> A univariate correlation matrix is tabulated in Table B4 of the online appendix.

<sup>17</sup> Because this point estimate is an interesting contribution itself, we triangulate this finding with evidence from two unrelated datasets. Allee and Yohn ([2009], Table 1) use the SSBF (Survey of Small Business Finance) to show that 32% of firms that *applied* for a loan in the last three years produced financial statements. We consider this estimate to be a lower bound because firms with financial statements are more likely to secure credit. Cassar [2009] examines a survey from the Panel Study of Entrepreneurial Dynamics (PSED), and shows that 61% (57%) of start-up ventures prepare an income statement (balance sheet) on a monthly basis. Because the PSED data focus on financial

specific details of the financial statement requests other than frequency, we unfortunately do not observe the level of financial statement verification or the basis of financial statement preparation (e.g., accrual or cash basis). Banks request business tax returns 43% of the time, which is notable considering that firms are required to produce them annually for the IRS. Given tax returns are requested less frequently than financial statements, this provides initial evidence that they do not substantially displace financial reporting despite the low marginal cost. On average, banks make about 10 non-financial information requests (all requests that are neither financial statements nor tax returns) per year from each borrower (6 at the median).

The average (median) loan size in our sample is \$232,835 (\$100,000), which is consistent with prior studies of small business lending. We measure relationship length using the origination date of the oldest loan we observe for a borrower, consistent with studies using the Federal Reserve Board's Survey of Small Business Finance (SSBF) dataset (e.g., Petersen and Rajan [1994]; Berger et al. [2005]). We find an average relationship of just less than three years, which is likely understated given our truncated measurement approach. We measure relationship breadth by using an indicator variable for whether the borrower has multiple loans with the bank, and find approximately half of the firms have more than one loan. Loans secured by collateral other than commercial real estate comprise 39% of our sample, slightly lower than the 53% of loans in the SSBF dataset (Cassar et al. [2015]).

Our measure of credit risk is credit spread which is the difference between the loan's interest rate and the US prime rate at loan origination. Although prior studies typically use credit spread to measure credit risk, it is measured after, or in conjunction with, the decision to contract on the provision of financial statements and, thus, has an endogeneity issue. Ideally, we would

---

statement *production* (a necessary, but not sufficient condition for bank *collection*), this evidence is a potential upper bound. Our 51% point estimate is between these two bounds.

like to have a measure of credit risk assessment independent of the ongoing provision of financial statements, because the provision of financial statements likely affects the perception of credit risk, and thus the credit spread offered. Unfortunately, such a variable does not exist in our dataset. Therefore, we measure borrower credit risk with alternative approaches to mitigate endogeneity concerns, which we describe in section 4. The average and median interest rates on the loans are both 6% and Table 1, Panel B reports that 41% of the loans have variable interest rates.

Finally, we tabulate loan type. To categorize the type of loan, we start with the “loan-type” variable provided in the dataset, which identifies loans as C&I and CRE as described above. We then use the tenor of the loan to separate C&I loans into “lines of credit” and “term loans” under the assumption that lines of credit have maturities of 12 months or less and term loans have maturities greater than 12 months. Table 1, Panel B indicates 23.3% of the loans are lines of credit, 45.3% are term loans, and 31.4% are commercial real estate loans.

Before turning to the formal testing, discussion of a few caveats of the data is worthwhile. First, at least two potential sample selection biases exist. Implementation of the SLA system is not a random assignment across banks—it is a bank choice. In particular, banks with sufficient scale and sophistication likely produce a product similar to SLA in-house or choose larger vendors. Therefore, the external validity of our results could be limited. However, we note that although the identities of the banks remain confidential, information supplied by the vendor suggests banks in the sample range from approximately the 10<sup>th</sup> percentile to the 95<sup>th</sup> percentile in terms of assets across all banks in the United States, and operate in wide-ranging geographic locations and product markets. This bank heterogeneity in the sample mitigates concerns that banks from only certain regions or sizes select into the dataset. Another threat to external validity

is the limited window over which the data were collected. Most loans in the sample were originated between 2009 and 2012—the post-crisis era—and therefore, our findings may not apply to alternative time periods.

Second, we have limited data about the banks and the borrowers. The former represents an issue in the sense that bank structure influences the manner in which the bank operates (Stein [2002]; Cole, Goldberg, and White [2004]; Berger et al. [2005]; Berger, Minnis, and Sutherland [2016]). We include bank fixed effects in our analyses to mitigate issues with unobserved heterogeneity across banks affecting our inferences. Lacking borrower data is more problematic because of omitted variable concerns. We attempt to address these concerns by including in all of our tests the size and observable terms of the loan, though we acknowledge a potential for omitted variable bias is not eliminated. Finally, many of the variables in our study are derived from simultaneously determined debt contract features, limiting the extent to which we can make causal statements.

We mitigate each of these concerns where possible (e.g., using exogenous differences in collateral laws across states, using bank fixed effects, simultaneously bundling various loan characteristics), but the main thrust of our study is to provide a novel analysis of when banks use financial statements to monitor borrowers. The strength of our study is a direct measure of this construct using data from a broad cross section of banks.

## **4. Empirical Tests and Results**

### *4.1 Conditional Means Analyses*

We begin our analysis with descriptive statistics conditional on financial reporting characteristics. Table 2 presents an analysis of the sample partitioned based on the level of financial statement reporting. Panel A partitions the sample based on whether the bank requests a



firm's financial statements. When loans are larger, banks are more likely to request financial statements and non-financial information. On the other hand, credit spread and frequency of collateralization are similar for both groups. Panel B separates the sample of loans for which banks request financial statements into two groups based on whether the financial statements are requested annually or more frequently. This contrast is more distinctive. Loans for which banks request financial statements annually are very similar to those for which banks make no financial requests (compared to those in Panel A), whereas the loans for which banks request financial statements more than once per year are larger, more likely to be collateralized, and have significantly more non-financial information requests. This finding provides initial evidence that financial statement requests made on the intensive margin are distinct from those made on the extensive margin. Finally, Panel C partitions the sample into four mutually exclusive categories conditional on combinations of whether banks collect financial statements or business tax returns. Loans for which banks collect both financial statements and tax returns are the largest and also have the most non-financial requests. When banks collect neither financial statements nor tax returns, loan amounts are the smallest, relationships are the longest, and the level of non-financial information collection is high.

Table 3 partitions the sample based on credit spread (Panel A) and relationship length (Panel B) to provide an initial analysis of the link between credit risk, relationship length, and financial reporting. Panel A shows distinct relations between the risk of the borrower, financial reporting, and relationship length. The extreme quintiles (1 and 5) have the lowest levels of financial statement requests, whereas the highest are in the middle quintile, providing initial evidence of an inverted U-shaped relation between banks' requests for financial statements and borrowers' credit risk. Column 2 indicates that this inverted U-shape is particularly apparent for

on interim financial statements, which are more costly to request and provide.<sup>18</sup> Relationship length is decreasing in credit spread, suggesting banks ration credit to the highest risk and least familiar borrowers. Panel B sorts loans into quintiles of relationship length, and shows financial statement requests are monotonically decreasing in the borrower's relationship, consistent with this reputation source serving as a substitute for costly financial monitoring.

#### 4.2 Main Analyses

We model bank requests for financial statements with the following OLS regression, subscripted by loan  $i$ :<sup>19</sup>

$$\begin{aligned}
 F/S\ Request_i = & \beta_1 * \text{Log Relationship Length}_i + \beta_2 * \text{Credit Spread Quintile}_i + \beta_3 * \\
 & \text{Credit Spread Quintile}^2_i + \beta_4 * \text{Multiple Loans}_i + \beta_5 * \\
 & \text{Has Collateral}_i + \beta_6 * \text{Business Tax Return Requests}_i + \beta_7 * \\
 & \text{Log Non Financial Requests}_i + \beta_8 * \text{Log Loan Amount}_i + \beta_9 * \\
 & \text{Log Loan Maturity}_i + \beta_{10} * \text{Variable Rate}_i + \beta_{11} * \text{Line of Credit}_i + \\
 & \beta_{12} * \text{CRE Loan}_i + \eta_i^{time} + \lambda_i^{bank} + \delta_i^{industry} + \varepsilon_i.
 \end{aligned}$$

Our main variables of interest are those that measure the nature of the bank-borrower relationship, the borrower's credit risk, the presence of collateral, and collection of tax returns. We measure the length of the bank-borrower relationship (*Log Relationship Length*) as the log of the number of months since the initiation of the oldest loan in the dataset. We measure the breadth of the relationship as an indicator for whether the firm has more than one loan with the bank (*Multiple Loans*). We use *Credit Spread Quintile* to examine the relation between credit

---

<sup>18</sup> While Diamond's [1991] predicted inverted U-shape is not restricted to financial reporting, we do not observe a distinct U-shape pattern for non-financial requests in column 6. We suspect that this is because many of these non-financial requests are low-cost mechanisms specifically related to proof of a particular collateral item (e.g., UCC filing) or insurance, which would not comport to theory as tightly as a higher cost mechanism, such as financial reporting. In Table B8 of the online appendix, we also find that the inverted U-shape does not manifest when considering tax returns. This is consistent with tax returns being both less costly and less beneficial than financial statements, and thus not comporting to theory as tightly.

<sup>19</sup> Throughout the analysis, we use OLS specifications to ease the interpretation of the coefficients and avoid issues with multiple fixed effects in non-linear models (Johnston and DiNardo [1997]). Nevertheless, we show in Table B2 of the online appendix that logit specifications do not alter our inferences.

reputation and financial statement requests and include the square of *Credit Spread Quintile* to identify a non-linear relation.<sup>20</sup> *Has Collateral* is an indicator variable equal to 1 if we identify collateral other than commercial real estate associated with the loan and 0 otherwise. *Business Tax Returns Requested* is an indicator variable equal to 1 if the bank requests business tax returns from the borrower and 0 otherwise.

We control for various characteristics of the loan, borrower, and bank with several variables. We include the log specification of *Non-Financial Requests*, which measures the amount of information the bank requests of the borrower that is not related to financial data. We include the log specifications of the size (*Log Loan Amount*) and maturity (*Log Maturity*) of the loan, and an indicator for variable rate loans (*Variable Rate*). We also include indicator variables for lines of credit and CRE loans (with term loans as the holdout category) to control for economic differences in loan type.

Finally, we include fixed effects for time period, bank, and 2-digit NAICS industry.<sup>21</sup> We have insufficient observations in several of the years to have an indicator for each one, so we group years that broadly overlap with distinct macroeconomic and loan underwriting periods: before 2003; in the years 2003 to 2007 (“pre-crisis” era); in the years 2008 and 2009 (“financial crisis” era); and in the years after 2009. As discussed in section 3, inclusion of bank fixed effects controls for unobservable bank characteristics.<sup>22</sup> Because we only have industry codes for 43%

---

<sup>20</sup> We use the quintile of credit spread as our main credit reputation variable for three reasons: (1) it is a more representative proxy for the underlying construct of a credit “rating” that Diamond [1991] envisions, which is not a reference to the distribution of credit spread per se; (2) the economic magnitude estimates are directly comparable to the quintiled descriptive results in Table 3; and, (3) it mitigates issues of outliers in *Credit Spread*. Nevertheless, in Table B2 of the online appendix we tabulate the results using the continuous specification of credit spread, and find very similar patterns.

<sup>21</sup> We provide industry-level detail of our sample in Table B5 of the online appendix. In a robustness test tabulated in A2 of the online appendix, we find our inferences are similar if we restrict our sample to the observations not missing industry information, though statistically weaker given the substantially smaller sample size.

<sup>22</sup> Unfortunately, we do not have characteristics of the banks themselves, so we cannot relate monitoring characteristics to bank-level characteristics.

of our observations, we group the remaining firms under a single industry indicator to ensure a sufficient number of observations for our tests. We cluster standard errors at the firm level to account for borrowers with more than one loan.

Table 4 presents the main analyses of our paper. Column 1 excludes bank and industry fixed effects, whereas column 2 includes our full fixed effect structure without including the *Business Tax Returns Requested* variable. Column 3 reports the results for the full model and shows that requests for financial statements are negatively (positively) associated with the length (breadth) of the borrower's relationship with the bank. A one standard deviation increase in relationship length reduces the likelihood of financial statement reporting by 4%, ceteris paribus. Meanwhile, borrowers with multiple loan contracts with their bank are more likely to provide financial statements.<sup>23</sup> The coefficients on *Credit Spread Quintile* and *Credit Spread Quintile*<sup>2</sup> are significantly positive and negative, respectively, suggesting a non-linear relation. Financial statement requests are increasing in the credit risk of the borrower initially, but at a quintile level of 3.3, the relation becomes negative. Note this inflection point is nearly the center of the distribution, consistent with the descriptive results in Table 3. The coefficient on *Has Collateral* is not significant, indicating no discernable relation between financial statement requests and the presence of collateral, on average. The coefficient on the *Business Tax Returns Requested* variable is significantly negative (financial statements are requested 9% less frequently when tax returns are requested), suggesting tax returns and financial statements are substitutes conditional on other loan characteristics, on average.

In terms of the control variables, requests for non-financial documents are negatively associated with requests for financial statements, whereas the larger loans and those with shorter

---

<sup>23</sup> Note that information requests are measured at the borrower level, not the loan level so although the average number of requests per loan may be predicted to be lower with multiple loans with a bank, the total number of requests is predicted to be higher because of the relationship breadth.

maturities have higher rates of financial statement collection. Although the frequency of financial statement requests does not differ between lines of credit and term loans (i.e., the coefficient on *Line of Credit* is not significantly different from zero), the coefficient on the *CRE Loan* indicator is significantly negative, indicating financial statements are requested about 9% less frequently than term loans, consistent with the prediction that financial statements are less cost-beneficial for monitoring real estate loans.<sup>24</sup>

The dependent variable in columns 1–3 do not differentiate between annual or interim financial statement requests.<sup>25</sup> Column 4 of Table 4 alters the dependent variable to equal 1 only when the bank requests interim financial statements (biannually, quarterly, or monthly). Two variable relations change as predicted. First, the relation with *Has Collateral* becomes significantly positive. When collateral is posted, banks request interim financial statements approximately 4% more frequently than when collateral is not posted.<sup>26</sup> Second, the coefficient on *Non-Financial Requests* is significantly positive. When a bank requests increasing amounts of non-financial information, it also requests more frequent financial reporting. In other words, when banks have intensive information demands, frequent financial reporting serves as a *complement* to alternative information sources. Interestingly, where one might expect that the

---

<sup>24</sup> One explanation for lower rates of financial statement requests for CRE loans relative to C&I loans is that appraisals and inspections are more useful for monitoring real estate. In Table B1 of the online appendix, we tabulate document request types partitioned by C&I and CRE loans, and find appraisals are more frequently requested for CRE loans, but financial statements are much more commonly requested (50%) than appraisals (5%) for CRE loans. Based on anecdotal banker comments, appraisals are useful mechanisms when banks originate loans but are less beneficial as a monitoring mechanism after origination. In Table B6 of the online appendix, we also examine the Table 4 results separately for CRE and C&I loans. We find the inverted U-shape pattern maintains with respect to interim financial reporting for C&I loans, but the results are generally not significant for CRE loans. These findings highlight that our main results are most prevalent when costs are higher (interim reports) and benefits are higher (C&I rather than CRE loans).

<sup>25</sup> To further corroborate our main results, we modify the dependent variable to measure the intensity of financial reporting using a reporting score. The score increases in reporting intensity and equals zero when the bank requests neither financial statements nor tax returns, and one (two, three) when the bank requests tax returns (financial statements, tax returns *and* financial statements). Our results using this approach, tabulated in column 4 of Table B8 of the online appendix, are similar to our main results in Table 4.

<sup>26</sup> In Table B2 of the online appendix we separately control for collateral in the form of a guaranty (e.g., by the owner or the Small Business Administration) and find consistent inferences.

relation between financial statement requests and relationship length might be more negative when conditioning the dependent variable on interim financial statement requests, the findings reveal an insignificant relation. The analysis in column 5 is the same as in column 4 except the sample is conditioned on loans for which either annual or interim financial statements are requested; that is, we examine the intensive margin of financial reporting requests and find very similar results. These results highlight important differences between annual and interim financial statements in the small commercial loan setting.

Collectively, Table 4 presents the main results of this paper: relationships and tax returns are negatively related to requests for financial statements; financial statements are requested most frequently from borrowers with middle-tier credit risk as suggested by Diamond [1991]; and, financial statement requests by banks are positively associated with the provision of collateral, but only if the financial statements are provided frequently. These results, however, are subject to a number of potential critiques that we now address with additional cross sectional and robustness tests.

### *4.3 Cross Sectional and Robustness Tests*

#### *4.3.1 Borrower Risk and the Use of Credit Spread*

In the main results, we use credit spread as the proxy for credit risk and reputation. A significant concern with this variable is endogeneity. In particular, loan pricing is likely set after (or simultaneously with) an agreement between the bank and borrower on financial reporting requirements. This simultaneity is a threat to our identification if the borrower's willingness to provide financial statements to the bank on an ongoing basis alters the perception of the

borrower's riskiness.<sup>27</sup> To address this concern, we take an alternative approach to identify borrower risk level by considering the various loan terms *simultaneously*. We partition loans with features consistent with low-risk and high-risk borrowers based on these loan characteristics. Specifically, we classify borrowers that receive above (below)-median maturity, fixed (variable) rate loans at a credit spread in the lowest (highest) tercile without (while) posting collateral as low (high) risk. Borrowers that do not have loans with *all* of these features are classified as medium-risk. Our logic underlying this grouping approach is that a bank would not provide this particular combination of features to a borrower in a loan contract simultaneously without also considering the borrower's *ex-ante* risk (i.e., before considering the provision of financial statements).<sup>28</sup>

Table 5, Panel A presents the results after partitioning borrowers into these three mutually exclusive groups. We continue to find an inverted U-shaped relation between borrower risk and financial statement requests; that is, the medium-risk group has the highest level of financial statement requests, whereas the low- and high-risk groups have lower financial statement request rates. The inverted U-shape also manifests for interim financial statements.

One concern with our bucketing approach is that, while it is unlikely that the firms in the low and high risk buckets are not truly low and high risk, the approach is very restrictive and few firms are classified as either low or high risk. Therefore, in Panel B we eliminate the restriction related to collateral, resulting in a less restrictive approach with more firms classified as either

---

<sup>27</sup> For example, consider a bank offering a menu of contracts to a borrower that trades off the level of the spread with the provision of ongoing financial reporting. In this case, the causal chain is not the bank assessing risk and then requesting financial statements; rather, these two outcomes are selected simultaneously.

<sup>28</sup> In other words, we argue that a bank would not give a long maturity, fixed rate, uncollateralized loan at a low interest rate if the bank did not consider the borrower to be low-risk *ex-ante*. Likewise, low-risk borrowers would not accept a loan contract that had a short maturity, variable rate, collateralized loan at a high interest rate (only high-risk borrowers would do so).

low or high risk. Panel B shows that the inverted U-shape maintains.<sup>29</sup> In Panel C, columns 1 and 3 (2 and 4) we regress the indicator variable for the presence of a business (interim) financial statement request on indicator variables for the low and high risk buckets and include time fixed effects.<sup>30</sup> Columns 1 and 2 report the results using the more restrictive bucketing approach (from Panel A), while columns 3 and 4 use the less restrictive approach (from Panel B). The coefficients on the indicator variables across all specifications are negative, but statistical significance is weak for low risk bucket in the restrictive approach.<sup>31</sup> Collectively, the results from Table 5 should be interpreted with caution because our alternative approach to assessing credit risk confronts us with limited degrees of freedom and does not fully address all endogeneity issues. However, our approach mitigates concerns that the inverted U-shaped relation between financial reporting and borrower risk is explained by a straightforward reverse causality story.

#### 4.3.2 Collateral

In our main results, we find a positive relation between the presence of collateral and requests for interim financial statements. We infer from this finding that financial statements help the bank monitor collateral. One potential concern regarding this inference is that the positive relation between interim financial statement requests and collateral is the result of omitted variable endogeneity. For example, the type of borrower that posts collateral could also be more likely to generate interim financial statements for internal use (e.g., if financial

---

<sup>29</sup> We drop the collateral restriction because prior literature suggests ambiguity in the relation between collateral and borrower risk: collateral can serve either a screening or signaling role. Nevertheless, to be sure the results are not dependent on our choice of classifying variables, in untabulated results we drop each restriction one at a time (except for the credit spread) and continue to find an inverted U-shape relation between our alternative risk proxy and financial statement requests.

<sup>30</sup> One downside to this simultaneous risk bucketing approach is that few banks or industries have sufficient observations across all risk buckets to include either bank or industry fixed effects in these regressions.

<sup>31</sup> In an alternative regression specification in which we include the medium risk indicator and hold out the low and high risk indicators—effectively pooling the firms in the tails—we find a significantly positive coefficient on the medium risk indicator across all specifications.



statements are more likely to be produced for performance measurement purposes when the firm has fixed assets), and have a low marginal cost of providing these statements to the bank. Borrower type is the unobservable omitted variable and would result in an inappropriate inference from the positive relation between collateral and the interim financial statement requests. To address this endogeneity concern, we need a variable that is associated with the benefit of monitoring a borrower's collateral, but not the characteristics of the borrower.

We identify geographic states as either “borrower-friendly” or “lender-friendly” with respect to collateral repossession as our source of variation. State laws affect how easily a bank can liquidate a borrower and access the collateral, but the differences in these laws across states are plausibly exogenous to the characteristics of the borrower. Because we are unable to identify an existing index in the literature that categorizes states based on repossession laws, we develop one using publicly available measures of state laws and procedures following our discussions with legal experts and bankers.<sup>32</sup> We implement this approach by coding each state along three legal dimensions: (i) whether it requires lenders to go through a court to initiate foreclosure (Brown, Ciochetti, and Riddiough [2006]; Mian, Sufi, and Trebbi [2014]), (ii) whether the foreclosure process consumes an above-median amount of time, and (iii) whether material exceptions to the “peaceful repossession allowable” standard exist. We describe each of these laws in section C of the online appendix. We sum these three indicators to create a *Recovery Barrier* composite score that assesses banks' level of difficulty to repossess collateral in that state.<sup>33</sup> Finally, we create an indicator variable, *Low Recovery Barrier State*, that equals 1 for

---

<sup>32</sup> We thank Douglas Baird and Ed Morrison for valuable discussions about our approach.

<sup>33</sup> We do not know the identity of the bank, but we know the bank's state of location. We assign all of the loans for each bank to the bank's state. Because national banks can lend across state borders, assigning all of a bank's loans to a particular state likely induces noise in our repossession law variable. We examine state-level variation because small private firms are much more likely to resolve financial distress through state law procedures than federal bankruptcy. Morrison [2009] finds that the vast majority of distressed firms resolve their distress through state law, and that fewer than 20% file for petitions under the federal bankruptcy code.

states with *Recovery Barrier* scores below 2 (“lender-friendly”), and 0 otherwise (“borrower-friendly”).

Our approach provides useful variation for several reasons. First, procedural barriers to the bank recovering collateral reduce the benefit of (costly) ex-ante monitoring of that collateral; that is, these laws essentially make the collateral less liquid or available to the bank ex-post, rendering ex-ante tracking of the collateral less worthwhile (e.g., Mian et al. [2014]). Second, the initial shareholders in our sample of small firms are unlikely to choose their state of location based on the prevailing liquidation laws, and therefore the variation is not directly related to borrower type. Third, states vary considerably according to the process through which banks must proceed to repossess property, and the length of time this process takes, creating useful variation.

Although our goal in this approach is to develop a measure that broadly captures the degree to which a state is borrower or lender-friendly with respect to collateral recovery, there are limitations. Two of the three provisions we are able to identify are related to real property; however, as we have already shown by investigating differences between C&I and CRE loans, banks are more likely to use financial statements to monitor personal property rather than real property. Our assumption is that these provisions are still helpful in identifying “borrower-friendly” from “lender-friendly” states, generally. In the online appendix, we tabulate results which show that all three of our *Recovery Barrier* components are positively correlated with each other and that loans in “borrower-friendly” states are less likely to be collateralized. These results provide some validation for our assumption and the relevance of our measure (see Tables C3 and B7 of the online appendix, respectively). We also have to assume that the repossession provisions are uncorrelated with borrower type and financial statement preparation cost—

assumptions that are more difficult to test, but seem plausible given the varied distribution of laws across the states documented in the online appendix.

We augment equation (1) with the interaction *Has Collateral \* Low Recovery Barrier State*, generating a difference-in-difference design:

$$\begin{aligned}
 F/S\ Request_i = & \beta_1 * \text{Log Relationship Length}_i + \beta_2 * \text{Credit Spread Quintile}_i + \beta_3 * \\
 & \text{Credit Spread Quintile}^2_i + \beta_4 * \text{Multiple Loans}_i + \beta_5 * \\
 & \text{Has Collateral}_i + \beta_6 * \text{Has Collateral}_i * \\
 & \text{Low Recovery Barrier State}_i + \beta_7 * \\
 & \text{Business Tax Return Requests}_i + \beta_8 * \\
 & \text{Log Non Financial Requests}_i + \beta_9 * \text{Log Loan Amount}_i + \beta_{10} * \\
 & \text{Log Loan Maturity}_i + \beta_{11} * \text{Variable Rate}_i + \beta_{12} * \text{Line of Credit}_i + \\
 & \beta_{13} * \text{CRE Loan}_i + \eta_i^{time} + \lambda_i^{bank} + \delta_i^{industry} + \varepsilon_i
 \end{aligned}$$

In column 1 of Table 6, we find *Has Collateral*—the relation between collateral and interim financial statement requests for high-barrier states—is statistically insignificant. In other words, in states in which collateral is less cost-beneficial to the bank, the extent of financial monitoring is unrelated to collateral. By contrast, the sum of  $\beta_1$  and  $\beta_2$ , which is the coefficient of the relation between collateral and financial statement requests in low repossession barrier states, is statistically significant. Therefore, the relation between financial monitoring and collateral is strong in easy recovery states, that is, states in which collateral monitoring is more cost beneficial. Moreover, the difference-in-difference term (the interaction term on *Has Collateral \* Low Recovery Barrier State*) is positive and significant at the 5% level.<sup>34</sup> To corroborate this finding, we examine whether this relation is stronger when we exclude CRE loans, for which interim financial statements are a less beneficial monitoring device relative to C&I loans. Column 2 shows this is indeed the case: the coefficient on the interaction is 58% larger and

---

<sup>34</sup> Because we include bank fixed effects, and banks are assigned to only one state, we exclude the main effect for *Low Recovery Barrier State* since we cannot identify its effect separately from the bank level fixed effect. States' legal and procedural barriers to repossession are predominantly constant throughout our sample period, preventing us from exploiting changes in these variables.

statistically different (p-value .06) than the full sample result of column 1.

We tabulate several additional robustness checks of the Table 6 result in Table B7 of the online appendix. First, we run our main regression in equation (1) on high and low recovery barrier state loans separately (i.e., a fully interacted regression with the *Low Recovery Barrier State* variable) and find the positive relation between collateral and interim reporting is only present in low recovery barrier states. This result, combined with the fact that we include industry fixed effects, mitigates concerns that unaccounted for differences between high and low recovery states (e.g., differing industry concentrations) that may be related to loan collateralization are driving the results. Second, we also find the result is not sensitive to conditioning only on loans for which banks require some level of reporting (annual or interim financial statements). Third, we use our ordered *Recovery Barrier* composite score instead of the *Low Recovery Barrier State* indicator, and find a negative (though marginally insignificant) relation between collateral recovery barriers and interim financial statement requests. In sum, the contrast between high- and low-recovery barrier states suggests the relation between collateral and frequent reporting presented in Table 4 reflects the usefulness of financial information in monitoring collateral, rather than unobserved borrower characteristics.

#### *4.3.3 Tax Returns as Alternative Information Sources*

In our main tests, we find banks request financial statements significantly less frequently when they request tax returns. This evidence suggests to us that tax returns are substitutes for financial statements, in general. In this section, we expand this analysis in two ways. First, we measure the level of asset intensity and intangible assets to further examine the substitutability of tax returns and financial statements cross-sectionally. Second we examine the hypothesis that tax returns and financial statements are complements when information asymmetry is particularly

high or monitoring is particularly beneficial.

Because we do not observe the financial information of the borrowers in our sample, we use Compustat to calculate the median level of intangible assets (intangible assets (*INTAN*) scaled by total assets (*AT*)) and asset intensity (total assets (*AT*) divided by sales (*SALE*)) for each 3-digit NAICS industry. We then create an indicator variable for each industry to assign it to a high (=1) or low (=0) category for both variables based on the median level. We then use the subsample of loans in our dataset reporting industry information and classify each borrower based on its industry. Our tests use equation (1) but omit industry fixed effects because the variables of interest (*Intangible Assets* and *Asset Intensity*) are defined at the industry level. Table 7, Panel A presents the results. Column 1 (2) reports the conditional relation between intangible assets (asset intensity) and financial statement requests. Column 1 (2) shows banks make relatively fewer (more) requests for financial statements when the firm is in an industry with high levels of intangible assets (asset intensity).

We then examine the *relative* usefulness of financial statements and tax returns, conditional on asset tangibility. Columns 3 and 4 of Table 7 examine when banks collect tax returns but not financial statements, conditional on some financial information being collected (at least one of the two types of reports). Using our industry-based variables for intangible assets and asset intensity, we find the opposite sign for both *Intangible Assets* and *Asset Intensity* as in columns 1 and 2, respectively: banks request tax returns more (less) frequently *without financial statements* when the firm has high intangible assets (asset intensity). These results suggest financial information from these borrowers is still important, but also reveal that banks and borrowers find tax returns an important alternative when financial reporting is potentially more costly.

We next expand our tax return analysis by examining whether tax returns serve as complementary monitoring mechanisms to firm financial reports when a bank benefits from monitoring a borrower more intensively. In comparison with our main set of findings, which indicate banks request financial statements less frequently when they request tax returns, this hypothesis suggests that for situations in which information asymmetry problems are most severe, banks use tax returns *in conjunction with* financial statements. To find evidence for this hypothesis, we examine the circumstances under which the bank requests tax returns *and* financial statements *simultaneously*. We create an indicator variable that equals 1 if the bank requests both a financial statement *and* a tax return, and 0 if it requests only one *or* the other (i.e., as in columns 3 and 4 of Panel A, the sample is conditional on a request for at least one type of statement).

Table 7, Panel B presents the results. Although the statistical significance is marginal for most variables, the table shows that banks are more likely to request a tax return and financial statements simultaneously precisely when information asymmetry problems are most salient: when the borrower has more than one loan and the bank's relationship with the borrower is shorter, and when the bank is requesting more additional non-financial information. Moreover, consistent with the prediction of Diamond [1991] in which monitoring is most cost beneficial for middle-tier firms, we find an inverted U-shaped relation between borrower risk and the simultaneous request for financial statements and tax returns (i.e., the main effect on *Credit Spread Quintile* is significantly positive, whereas the squared term is significantly negative—and the inflection point is 2.9, near the middle of the distribution).<sup>35</sup> Taken together, the evidence

---

<sup>35</sup> In results tabulated in Table B8 in the online appendix, we examine the possibility that tax returns have a similar inverted U-shaped relation with borrower credit risk. Column 2 shows no economic or statistical pattern exists between borrower risk and tax reporting, which is in contrast to financial statements (our original Table 4 column 2 results for financial reporting are repeated in column 1 to facilitate comparison). This evidence supports our use of

from Table 7 suggests that a firm's tax returns can serve as both substitutes and complements to financial statement monitoring, conditional on the information environment.

## 5. Conclusion

We gain access to a proprietary dataset of information requests from banks to borrowers after loan origination to examine when banks use financial statements to monitor small commercial borrowers. We find financial statements are the most requested item in the dataset; however, banks request them from only half of the borrowers. Financial reporting thus exceeds a cost-benefit threshold quite frequently, even in a setting in which the average loan size is small and financial statements are infrequently audited. This finding also reveals borrowers are able to attract financing without continuously providing financial statements to banks.

We use theoretical frameworks from accounting and banking to understand the observed variation in the use of financial statements for monitoring. We find banks most frequently request financial statements from firms with middle-tier credit risk, whereas firms with either high or low credit risk receive significantly fewer financial statement requests. This finding not only provides evidence for the joint hypothesis that the net benefits of monitoring are highest for middle-risk borrowers (Diamond [1991]) and that financial statements are useful ex-post monitoring devices, but also that the relation between financial statements and borrower risk is non-monotonic, a useful consideration for future empirical research. We also find that while financial statements are not related to the presence of collateral overall, bank requests for interim financial statements are increasing in the presence of collateral. This finding suggests that financial statements can serve an important complementary monitoring role in the presence of

---

Diamond's (1991) model of *costly* monitoring to motivate our tests of when banks request financial statements after loan origination.

collateral.

We also provide direct evidence on the usefulness of tax returns vis-à-vis financial statements in debt contracting for small firms. Even though the IRS mandates the production of tax returns for all firms each year, we find that banks request them less often than financial statements. Moreover, while our analyses reveal that a firm's tax returns can substitute for financial statements, generally, we find banks are more likely to request *both* financial statements and tax returns when information asymmetry is particularly salient. In other words, the implicit government monitoring of tax returns provides a complementary verification channel for financial statements, and further suggests that tax returns and financial statements serve distinct monitoring roles in this setting. Together, these results contribute novel evidence to our understanding of financial reporting in US privately held firms. These findings should be relevant to both academics studying the role of financial reporting in lending markets, and to standard setters considering changes to financial reporting for privately held firms.

While our dataset provides unique insights to further our understanding of how banks use financial statements to monitor borrowers and our results are robust to alternative specifications, the dataset is far from comprehensive in measuring many elements which are likely quite important to debt contracting, and monitoring more generally. Thus, it is hard to completely mitigate concerns about omitted variables, preventing us from making causal statements. Moreover, our results may lack generalizability to settings with larger firms, especially those in the public domain where the credit and financial reporting markets are different. We encourage future research with more comprehensive datasets and other settings to consider these issues and offer further evidence on how banks monitor.



## References

- ALLEE, K., and T. YOHN. "The Demand for Financial Statements in an Unregulated Environment: An Examination of the Production and Use of Financial Statements by Privately-held Small Businesses." *The Accounting Review* 84 (2009): 1-25.
- AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS (AICPA). *Understanding the financial reporting framework for small- and medium-sized entities*. New York, NY: AICPA (2013).
- ARMSTRONG, C., W. GUAY, and J. WEBER. "The Role of Information and Financial Reporting in Corporate Governance and Contracting." *Journal of Accounting and Economics* 50 (2010): 179-224.
- BALL, R., R. BUSHMAN, and F. VASVARI. "The Debt-contracting Value of Accounting Information and Loan Syndicate Structure." *Journal of Accounting Research* 46 (2008): 247-287.
- BEATTY, A., S. LIAO, and J. WEBER. "Evidence on the Determinants and Economic Consequences of Delegated Monitoring." *Journal of Accounting and Economics* 53 (2012): 555-576.
- BERGER, A., N. MILLER, M. PETERSEN, R. RAJAN, and J. STEIN. "Does Function Follow Organizational Form? Evidence from the Lending Practices of Large and Small Banks." *Journal of Financial Economics* 76 (2005): 237-269.
- BERGER, P., M. MINNIS, and A. SUTHERLAND. "There is More to a Bank than its Size: Bank Expertise and Financial Information Collection." Working paper.
- BERGER, A., and G. UDELL. "Collateral, Loan Quality, and Bank Risk." *Journal of Monetary Economics* 25 (1990): 21-42.
- BERGER, A., and G. UDELL. "A More Complete Conceptual Framework for SME Finance." *Journal of Banking and Finance* 30 (2006): 2945-2966.
- BESANKO, D., and A. THAKOR. "Competitive Equilibrium in the Credit Market Under Asymmetric Information." *Journal of Economic Theory* 42 (1987): 167-182.
- BESTER, H. "Screening vs. Rationing in Credit Markets with Imperfect Information." *American Economic Review* 75 (1985): 850-855.
- BESTER, H. "The Role of Collateral in Credit Markets with Imperfect Information." *European Economic Review* 31 (1987): 887-899.
- BOOT, A. W. "Relationship Banking: What do we Know?." *Journal of Financial Intermediation*, 9(1) (2000): 7-25.
- BOOTH, J. "Contract Costs, Bank Loans, and the Cross-Monitoring Hypothesis." *Journal of Financial Economics* 31.1 (1992): 25-41.
- BOTOSAN, C., H. ASHBAUGH-SKAIFFE, A. BEATTY, P. DAVIS-FRIDAY, P. HOPKINS, K. NELSON, K. RAMESH, R. UHL, M. VENKATACHALAM, and G. VRANA. "Financial Accounting and Reporting Standards for Private Entities." *Accounting Horizons* 20 (2006): 179-194.

- BRADSHAW, M., D. BENS, C.A. FROST, E. GORDON, S. MCVAY, G. MILLER, R. PFEIFFER, M. PLUMLEE, C. SHAKESPEARE, W. THOMAS, F. WONG. Financial Reporting Policy Committee of the American Accounting Association's Financial Accounting and Reporting Section: Accounting standard setting for private companies. *Accounting Horizons* 28 (2014): 175-192.
- BROWN, D., B. CIOCHETTI, and T. RIDDIOUGH. "Theory and Evidence on the Resolution of Financial Distress." *Review of Financial Studies* 19 (2006): 1357-1397.
- CARRIZOSA, R., and S. RYAN. "Borrower Private Information Covenants and Loan Contract Monitoring and Renegotiation." Working paper (2016).
- CASSAR, G. "Financial Statement Projection Preparation in Start-up Ventures." *The Accounting Review* 84 (2009): 27-51.
- CASSAR, G., K. CAVALLUZZO, and C. ITTNER. "Alternative Information Sources and Information Asymmetry Reduction: Evidence from Small Business Debt." *Journal of Accounting and Economics* 59 (2015): 242-263.
- CHRISTENSEN, H., V. NIKOLAEV, and R. WITTENBERG-MOERMAN. "Accounting Information in Financial Contracting: An Incomplete Contract Theory Perspective." Working paper (2015).
- COLE, R., L. GOLDBERG, and L. WHITE. "Cookie-cutter versus Character: The Micro Structure of Small Business Lending by Large and Small Banks." *Journal of Financial and Quantitative Analysis* 39 (2004): 227-252.
- CONTINO, R. Handbook of Equipment Leasing: A Deal Maker's Guide. 2<sup>nd</sup> ed. New York: American Management Association, 1996.
- DEGRYSE, H., M. KIM, and S. ONGENA. Microeconometrics of Banking: Methods, Applications, and Results. Oxford University Press, USA, 2009.
- DELL'ARICCIA, G., and R. MARQUEZ. "Lending booms and lending standards." *Journal of Finance* 61(5) (2006): 2511-2546.
- DIAMOND, D. "Intermediation and Delegated Monitoring." *Review of Economic Studies* 51 (1984): 393-414.
- DIAMOND, D. "Reputation Acquisition in Debt Markets." *Journal of Political Economy* 97 (1989): 828-862.
- DIAMOND, D. "Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt." *Journal of Political Economy* 99 (1991): 688-721.
- FAMA, E. "What's Different About Banks?" *Journal of Monetary Economics* 15 (1985): 29-39.
- FINANCIAL ACCOUNTING FOUNDATION. "Blue Ribbon Panel on Standards Setting for Private Companies: Report to the Board of Trustees of the Financial Accounting Foundation." January 2011.
- FRANKEL, R., B. KIM, T. MA, and X. MARTIN. "Bank Monitoring and Accounting Recognition: The Case of Aging-Report Requirements." Working paper (2011).
- FREIXAS, X. and J.C. ROCHET. Microeconomics of Banking. Vol. 2. Cambridge, MA: MIT press. (1997).

- GE CAPITAL COMMERCIAL FINANCE. "Guide to Asset Based Lending." (1999).
- GÖX, R., and A. WAGENHOFER. "Optimal Impairment Rules." *Journal of Accounting and Economics* 48 (2009): 2-16.
- GUP, B. and J. KOLARI. *Commercial Banking*. 3<sup>rd</sup> ed. John Wiley & Sons. (2005).
- HANLON, M., J. HOOPEES, and N. SHROFF. "The Effect of Tax Authority Monitoring and Enforcement on Reporting Quality." *Journal of the American Taxation Association*. (2014).
- JENSEN, M., and W. MECKLING. "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure." *Journal of Financial Economics* 3 (1976): 305-360.
- JOHNSTON, J., and J. DINARDO. *Econometric Methods*. 4<sup>th</sup> ed. New York: McGraw-Hill. (1997).
- KAUSAR, A., N. SHROFF, and H. WHITE. 2016. "Real Effects of the Audit Choice." *Journal of Accounting and Economics* (2016), forthcoming.
- KOTHARI, S.P., K. RAMANNA, and D. SKINNER. "Implications for GAAP from an Analysis of Positive Research in Accounting." *Journal of Accounting and Economics* 50 (2010): 246-286.
- LEFTWICH, R., R. WATTS, and J. ZIMMERMAN. "Voluntary Corporate Disclosure: The Case of Interim Reporting." *Journal of Accounting Research* 19 (1981): 50-77.
- LISOWSKY, P. and M. MINNIS. "Which Private Firms Follow GAAP and Why?" Working paper (2015).
- MESTER, L., L. NAKAMURA, and M. RENAULT. "Transactions Accounts and Loan Monitoring." *Review of Financial Studies* 20 (2007): 529-556.
- MIAN, A., A. SUFI, and F. TREBBI. "Foreclosures, House Prices, and the Real Economy." *Journal of Finance* 70 (2015): 2587-2634.
- MINNIS, M. "The Value of Financial Statement Verification in Debt Financing: Evidence from Private Firms." *Journal of Accounting Research* 49 (2011): 457-506.
- MORRISON, E. "Bargaining around Bankruptcy: Small Business Workouts and State Law." *Journal of Legal Studies* 38 (2009): 255-307.
- OFFICE OF THE COMPTROLLER OF THE CURRENCY (OCC). "Rating Credit Risk: Comptroller's Handbook." April 2001.
- PETERSEN, M., and R. RAJAN. "The Benefits of Lending Relationships: Evidence from Small Business Data." *Journal of Finance* 49 (1994): 3-37.
- PURNANANDAM, A. "Originate-to-distribute model and the subprime mortgage crisis." *Review of Financial Studies* 24(6) (2011), 1881-1915.
- RAJAN, R., and A. WINTON. "Covenants and Collateral as Incentives to Monitor." *Journal of Finance* 50 (1995): 1113-1146.
- ROBERTS, M., and A. SUFI. "Renegotiation of Financial Contracts: Evidence from Private Credit Agreements." *Journal of Financial Economics* 93, no. 2 (2009): 159-184.

- SMALL BUSINESS ADMINISTRATION (SBA). "Small Business Lending in the United States 2012." July 2013.
- STEIN, J. "Information Production and Capital Allocation: Decentralized versus Hierarchical Firms." *Journal of Finance* 57 (2002): 1891-1921.
- SUFI, A. "Information Asymmetry and Financing Arrangements: Evidence from Syndicated Loans." *Journal of Finance* 62 (2007): 629-668.
- SUTHERLAND, A. "The Economic Consequences of Borrower Information Sharing: Relationship Dynamics and Investment." MIT Sloan Working paper (2016).
- WANG, Y., and H. XIA. "Do Lenders Still Monitor When They Can Securitize Loans?" *Review of Financial Studies* 27 (2014): 2354-2391.
- WATTS, R. "Corporate Financial Statements, a Product of the Market and Political Processes." *Australian Journal of Management* 2 (1977): 53-75.
- WATTS, R., and J. ZIMMERMAN. "The Demand for and Supply of Accounting Theories: The Market for Excuses." *The Accounting Review* 52 (1979): 273-305.
- WATTS, R., and J. ZIMMERMAN. "Agency Problems, Auditing, and the Theory of the Firm: Some Evidence." *Journal of Law and Economics* 26 (1983): 613-633.

## Appendix A: Variable Definitions

This appendix describes the measurement of each variable used in our study. All data comes from the Sagemworks Loan Administration platform.

Variable	Description
Business Financial Request	An indicator equal to 1 if business financial statements are collected from the borrower, and 0 otherwise.
Interim Financial Request	An indicator equal to 1 if business financial statements are collected from the borrower more than once per year. The indicator equals 0 otherwise, or alternatively if business financial statements are only collected annually, depending on the test (refer to the table captions).
Log Relationship Length	The natural log of the number of months since the firm's earliest loan with the bank was originated.
Credit Spread	The difference between the loan's interest rate and the US prime rate, measured as the rate posted by a majority of top 25 insured U.S.-chartered commercial banks, as reported on the Federal Reserve Board of Governors website. We note that a few loans have an unreasonably negative credit spread, likely because the date for measuring the prime rate and date of the interest rate in the dataset are not the same (e.g., the reported interest rates for loans established before the bank implemented the SLA system likely have updated interest rates, but we have to map prime rates to the date the loan was initiated). We re-assign loans with a credit spread of less than -200 bps a credit spread of -200bps. We then add 200 bps to all loans, such that the minimum credit spread is 0 to ensure Credit Spread Squared is monotonically increasing in Credit Spread.
Multiple Loans	An indicator equal to 1 if the firm has more than one loan with the bank, and 0 otherwise.
Has Collateral	An indicator equal to 1 if the loan is collateralized; 0 otherwise. Note this is measured <i>incremental</i> to the CRE Loan indicator, such that CRE loans are only considered to have collateral if the loan is secured by assets (e.g., inventory or financial investments) beyond the commercial property.
Business Tax Return Request	An indicator equal to 1 if business tax returns are scheduled to be collected from the borrower, and 0 otherwise.
Log Non-Financial Request Count	The natural log number of non-financial requests the bank makes of the borrower, per year. Non-financial requests are those not related to financial statements or tax returns such as proof of insurance, information about the owner's personal wealth, and equipment listings.
Log Loan Amount	The natural log of the loan amount. The loan amount has been trimmed at the 1% level.
Log Maturity	The natural log of the maturity of the loan. The maturity is measured in months, and has been trimmed at the 1% level.
Variable Rate	An indicator equal to 1 if the loan is a Variable Rate loan, and 0 otherwise.

Line of Credit	An indicator equal to 1 if the maturity of the loan is less than 12 months, and 0 otherwise.
CRE Loan	An indicator equal to 1 if the loan is a commercial real estate loan, and 0 otherwise.
Judicial Procedures State	An indicator equal to 1 if the bank is headquartered in a state where it must go through a court to initiate a mortgage foreclosure, and 0 otherwise. The judicial law process is somewhat more bureaucratic and time consuming than the power-of-sale process (Brown, Ciochetti, and Riddiough 2006). Data on state laws are drawn from the Mortgage Bankers Association website.
Process Period	The length of the foreclosure process in the state of the bank's headquarters, measured in days. Data on state process periods are drawn from <a href="http://www.realtytrac.com/foreclosure-laws/foreclosure-laws-comparison.asp">www.realtytrac.com/foreclosure-laws/foreclosure-laws-comparison.asp</a> . If a range is provided (e.g., 170-210), the midpoint is used (190). Date of access: February 2, 2015.
Repossession Barrier	An indicator equal to 1 if the bank is headquartered in a state with a material exception to the "peaceful repossession allowable" standard for collateral. Data on state laws are drawn from <a href="http://www.creditinfocenter.com/legal/auto-repossession-laws.shtml">www.creditinfocenter.com/legal/auto-repossession-laws.shtml</a> . Date of access: February 2, 2015.
Recovery Barrier composite score	A composite score ranging from 0 to 3 that measures the difficulty of liquidating a borrower. The scale works as follows. The score is the sum of the Judicial Procedures State and Recovery Barrier indicators, plus an indicator equal to 1 if the Process Period is above the median.
Low Recovery Barriers State	An indicator equal to 1 if the bank is headquartered in a state that has a Recovery Barrier composite score less than 2.
Intangible Assets	An indicator equal to 1 if the firm is in an industry that is above the median with respect to the ratio of Intangible Assets ( <i>INTAN</i> ) to Total Assets ( <i>AT</i> ), using the universe of Compustat firms with NAICS codes reported in 2011, and 0 otherwise. Industry groups are defined at the three-digit NAICS code level.
Asset Intensity	An indicator equal to 1 if the firm is in an industry that is above the median with respect to the ratio of Total Assets to Sales, using the universe of Compustat firms with NAICS codes reported in 2011, and 0 otherwise. Industry groups are defined at the 3-digit NAICS code level.

**Table 1: Descriptive Statistics**

Panel A: Sample Selection						
Initial Business Loans						9,290
Eliminate loans from banks with fewer than 10 unique borrowers						(141)
Eliminate loans for firms missing loan terms, relationship data, or correspondence data						<u>(4,631)</u>
Final Sample						4,518
Panel B: Descriptive Statistics for Monitoring and Contract Variables						
	<i>Mean</i>	<i>Std Dev</i>	<i>25%</i>	<i>50%</i>	<i>75%</i>	<i>N</i>
Business Financial Request	0.51	0.50	0.00	1.00	1.00	4,518
Interim Financial Request	0.24	0.43	0.00	0.00	0.00	2,288
Relationship Length (months)	31.58	39.80	9.60	20.79	40.41	4,518
Interest Rate	6.05	1.18	5.25	6.00	6.75	4,518
Multiple Loans	0.50	0.50	0.00	0.00	1.00	4,518
Has Collateral	0.39	0.49	0.00	0.00	1.00	4,518
Business Tax Return Request	0.43	0.49	0.00	0.00	1.00	4,518
Non-Financial Requests	9.94	19.87	0.00	6.00	10.00	4,518
Loan Amount	232,835	354,909	40,100	100,000	250,000	4,518
Maturity (months)	107.68	135.98	10.00	36.00	171.00	4,518
Variable Rate	0.41	0.49	0.00	0.00	1.00	4,518
Term Loan	0.45	0.50	0.00	0.00	1.00	4,518
Line of Credit	0.23	0.42	0.00	0.00	0.00	4,518
CRE Loan	0.31	0.46	0.00	0.00	1.00	4,518

This table presents the sample selection (Panel A) and descriptive statistics (Panel B) for firm-loan observations used in the analyses. Business Financials Requested is an indicator equal to one if the bank requests business financial statements. Interim Financials Request is an indicator equal to one if business financial statements are collected more than once per year. Only observations in which financial statements are requested are considered for this row. Loan term variables excluding indicators are truncated at the 1% level. See Appendix A for variable definitions.

**Table 2: Descriptive Statistics by Financial Report Type****Panel A: Business Financial Statement Collection**

	<i>Relationship Length (months)</i>	<i>Credit Spread</i>	<i>Has Collateral</i>	<i># of Non- Financial Requests</i>	<i>Loan Amount</i>	<i>N</i>
Business Financials not collected	38.42	1.98	0.39	8.88	209,415	2,230
Business Financials collected	24.90	2.02	0.40	10.98	255,662	2,288

**Panel B: Business Financial Statement Collection Frequency**

	<i>Relationship Length (months)</i>	<i>Credit Spread</i>	<i>Has Collateral</i>	<i># of Non- Financial Requests</i>	<i>Loan Amount</i>	<i>N</i>
Business Financials collected annually	25.32	2.01	0.35	8.57	217,755	1,732
Business Financials collected more often than annually	23.59	2.08	0.56	18.47	373,747	556

**Panel C: Business Financial Statement and Business Tax Return Collection**

	<i>Relationship Length (months)</i>	<i>Credit Spread</i>	<i>Has Collateral</i>	<i># of Non- Financial Requests</i>	<i>Loan Amount</i>	<i>N</i>
Business Financials and Business Tax Returns collected	23.80	1.96	0.39	12.92	272,886	1,209
Business Financials collected, but not Business Tax Returns	26.13	2.09	0.42	8.81	236,363	1,079
Business Tax Returns collected, but not Business Financials	27.52	1.71	0.42	4.96	238,045	728
Neither Business Financials nor Business Tax Returns collected	43.71	2.11	0.37	10.78	195,538	1,502

This table presents the means for selected variables conditional upon the type of financial report requested by the bank. See Appendix A for variable definitions.



**Table 3: Conditional Descriptive Statistics**

Panel A: Descriptive Statistics by Credit Spread Quintile							
	<i>Business Financial Requested</i>	<i>Interim Financial Request</i>	<i>Relationship Length</i>	<i>Interest Rate</i>	<i>Has Collateral</i>	<i>Non Financial Requests</i>	<i>Loan Amount</i>
Credit Spread Quintile 1	0.45	0.16	59.21	5.26	0.33	10.31	321,903
Credit Spread Quintile 2	0.54	0.30	27.36	5.42	0.41	9.41	293,953
Credit Spread Quintile 3	0.57	0.36	22.48	5.90	0.35	10.98	218,220
Credit Spread Quintile 4	0.51	0.19	23.94	6.33	0.47	9.90	199,457
Credit Spread Quintile 5	0.46	0.14	24.83	7.39	0.41	8.97	125,840

Panel B: Descriptive Statistics by Relationship Length Quintile							
	<i>Business Financial Requested</i>	<i>Interim Financial Request</i>	<i>Relationship Length</i>	<i>Interest Rate</i>	<i>Has Collateral</i>	<i>Non Financial Requests</i>	<i>Loan Amount</i>
Relationship Length Quintile 1	0.59	0.17	3.70	5.90	0.39	12.71	224,269
Relationship Length Quintile 2	0.59	0.22	11.25	6.01	0.44	9.78	212,285
Relationship Length Quintile 3	0.55	0.39	20.70	6.08	0.41	8.81	253,015
Relationship Length Quintile 4	0.45	0.27	35.40	6.20	0.42	8.60	227,143
Relationship Length Quintile 5	0.35	0.14	87.02	6.05	0.31	9.81	247,508

This table presents the means for various variables partitioned by quintile of credit spread (Panel A) and relationship length (Panel B). See Appendix A for variable definitions.

**Table 4: Determinants of Financial Statement Requests**

	(1) Business Financial Request	(2) Business Financial Request	(3) Business Financial Request	(4) Interim Financial Request	(5) Interim Financial Request
Log Relationship Length	-0.041*** [-2.94]	-0.029** [-2.52]	-0.035*** [-2.98]	-0.007 [-0.93]	-0.018 [-1.15]
Credit Spread Quintile	0.101*** [2.74]	0.055* [1.76]	0.055* [1.77]	0.058*** [3.49]	0.067** [2.24]
Credit Spread Quintile <sup>2</sup>	-0.015*** [-2.67]	-0.008* [-1.75]	-0.009* [-1.80]	-0.010*** [-3.82]	-0.011** [-2.39]
Multiple Loans	0.073*** [3.51]	0.046*** [2.66]	0.049*** [2.88]	0.014 [1.30]	0.038** [2.17]
Has Collateral	-0.053*** [-2.74]	-0.016 [-0.88]	-0.011 [-0.64]	0.043*** [3.16]	0.048** [2.17]
Business Tax Return Request			-0.090*** [-3.50]	0.018 [1.27]	0.001 [0.03]
Log Non-Financial Requests	-0.079*** [-9.06]	-0.023** [-2.47]	-0.026*** [-2.75]	0.040*** [5.28]	0.064*** [7.46]
Log Loan Amount	0.048*** [6.26]	0.038*** [5.76]	0.038*** [5.80]	0.030*** [6.95]	0.045*** [6.13]
Log Maturity	0.002 [0.20]	-0.015* [-1.86]	-0.015* [-1.85]	-0.006* [-1.73]	-0.010 [-1.54]
Variable Rate	0.031 [1.56]	0.012 [0.61]	0.018 [0.91]	0.044*** [3.59]	0.051** [2.37]
Line of Credit	0.005 [0.15]	-0.018 [-0.66]	-0.017 [-0.65]	-0.016 [-1.03]	-0.038 [-1.24]
CRE Loan	0.015 [0.63]	-0.094*** [-3.18]	-0.091*** [-3.15]	-0.103*** [-4.82]	-0.174*** [-4.66]
Fixed Effects	Time	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry
N	4,518	4,518	4,518	4,518	2,288
adj. R-sq	0.073	0.408	0.413	0.524	0.568
Sample	All	All	All	All	Conditional on requesting F/S

This table presents OLS regressions of financial statement requests on relationship length, tax reporting, non-financial monitoring, loan characteristics, and time, bank, and industry fixed effects. The dependent variable in the first three columns is an indicator equal to 1 if business financial statements are requested by the bank, and 0 otherwise. The dependent variable in the fourth column is an indicator equal to 1 if business financial statements are requested more often than once per year, and 0 otherwise. The dependent variable in the fifth column is an indicator equal to 1 if business financial statements are requested more often than once per year, and 0 if business financial statements are produced only annually. Thus, the sample in the fifth column is restricted to loans where financial statements are requested. See Appendix A for variable definitions. Reported below the coefficients are t-statistics clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

**Table 5: Financial Statement Requests and Alternative Risk Measures****Panel A: Univariate Analysis of Financial Requests Using Risk Buckets**

	Business Financial Request	Interim Financial Request	<i>N</i>
Low Risk	42.5%	9.6%	167
Medium Risk	51.2%	12.5%	4,321
High Risk	10.0%	0.0%	30

**Panel B: Univariate Analysis of Financial Requests Using Risk Buckets, Less Restrictive Classification**

	Business Financial Request	Interim Financial Request	<i>N</i>
Low Risk	41.3%	7.2%	334
Medium Risk	51.8%	12.9%	4,088
High Risk	34.4%	5.2%	96

**Panel C: Regression Analysis of Financial Statement Requests on Risk Buckets**

	Using Panel A Classification		Using Panel B Classification	
	(1) Business Financial Request	(2) Interim Financial Request	(3) Business Financial Request	(4) Business Financial Request
Low Risk	-0.066 [-1.40]	-0.012 [-0.39]	-0.086** [-2.40]	-0.041* [-1.95]
High Risk	-0.425*** [-7.56]	-0.135*** [-16.91]	-0.182*** [-3.51]	-0.083*** [-3.50]
Fixed Effects	Time	Time	Time	Time
N	4,518	4,518	4,518	4,518
adj. R-sq	0.008	0.005	0.007	0.007

This table presents the frequency of financial statement requests conditional on our estimated risk of the loan. In Panel A, we assign firms to low (high) risk categories when their loans have long (short) maturity, fixed (variable) rates, low (high) credit spreads, and no (having) collateral, and remaining firms to the medium risk category. In Panel B, the assignment is the same as Panel A, except we drop the restriction related to collateral. Reported in the cells are the frequency of financial statement requests and the number of borrowers classified into each risk bucket. In Panel C, we report the results of OLS regressions of the level of financial monitoring on an indicator for whether the firm is assigned as a low or high risk. In columns 1 and 2 (3 and 4), we use the assignments from Panel A (B). Reported below the coefficients are t-statistics clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

**Table 6: State Repossession Laws and Interim Financial Statement Requests**

		(1) Interim Financial Request	(2) Interim Financial Request
Has Collateral	$\beta_1$	0.011 [0.58]	0.002 [0.08]
Has Collateral * Low Recovery Barrier State	$\beta_2$	0.073** [2.45]	0.115*** [3.00]
	$\beta_1 + \beta_2$	0.084***	0.117***
	F-test	13.36	13.02
Control Variables?		Yes	Yes
Fixed Effects		Time, Bank, Industry	Time, Bank, Industry
N		4,062	2,820
adj. R-sq		0.529	0.548
Sample		All	C&I Loans Only

This table presents OLS regressions of the level of financial monitoring on the presence of relationship characteristics, tax reporting, non-financial monitoring, loan characteristics, and time, bank, and industry fixed effects. High (Low) Recovery Barrier states are those with Recovery Barrier composite scores of two or three (zero or one). Column 2 restricts the sample to C&I loans. See Appendix A for variable definitions. Reported below the coefficients are t-statistics clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

**Table 7: The Role of Tax Returns as an Alternative Information Source**

Panel A: Industry Characteristics and Financial Statement and Tax Return Requests				
	(1)	(2)	(3)	(4)
	Business Financial Request	Business Financial Request	Tax Return but not F/S Requested	Tax Return but not F/S Requested
Intangible Assets	-0.066** [-2.21]		0.096*** [2.60]	
Asset Intensity		0.059** [2.10]		-0.091** [-2.52]
Control Variables?	Yes	Yes	Yes	Yes
Fixed Effects	Time, Bank	Time, Bank	Time, Bank	Time, Bank
N	1,863	1,863	1,225	1,225
adj. R-sq	0.393	0.392	0.258	0.257
Sample	All	All	Conditional on requesting either a F/S or a tax return	Conditional on requesting either a F/S or a tax return

This table presents OLS regressions of the mix of requests on relationship characteristics, non-financial monitoring, loan characteristics, and time and bank fixed effects. In columns 1 and 2, the dependent variable in each column is an indicator equal to one if business financial statements are requested by the bank, and zero otherwise. In columns 3 and 4, the dependent variable in each column is an indicator equal to one if business tax returns are requested by the bank but business financial statements are not, and zero otherwise. The sample in all columns is restricted to loans not missing an industry code. The sample in columns 3 and 4 is further restricted to loans where either a financial statement or tax return is requested. Intangible Assets and Asset Intensity are indicator variables equal to one if the firm is in an industry that is above the median with respect to those characteristics using the universe of Compustat firms in 2011 with NAICS codes, and zero otherwise. Industry groups are defined at the three-digit NAICS code level. See Appendix A for variable definitions. Reported below the coefficients are t-statistics clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Panel B: Verification Role of Tax Returns

	(1)
	Bus Financials and Tax Return Requested
Log Relationship Length	-0.029* [-1.85]
Credit Spread Quintile	0.071* [1.67]
Credit Spread Quintile <sup>2</sup>	-0.012* [-1.82]
Multiple Loans	0.040* [1.74]
Has Collateral	0.051** [2.10]
Log Non-Financial Requests	0.018* [1.74]
Log Loan Amount	0.025*** [3.00]
Log Maturity	-0.004 [-0.42]
Variable Rate	0.053** [2.16]
Line of Credit	-0.020 [-0.58]
CRE Loan	-0.067* [-1.80]
Fixed Effects	Time, Bank, Industry
N	3,016
adj. R-sq	0.363
Sample	Conditional on requesting either a F/S or a tax return

This table presents OLS regressions of the level of financial and tax reporting on relationship characteristics, non-financial monitoring, loan characteristics, and time, bank, and industry fixed effects. The dependent variable is an indicator equal to one if both business financial statements and business tax returns are requested by the bank, and zero if only one of these documents is requested. The sample is restricted to loans where either a financial statement or tax return is requested. See Appendix A for variable definitions. Reported below the coefficients are t-statistics clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

Online appendix for:

**Financial Statements as Monitoring Mechanisms:  
Evidence from Small Commercial Loans**

<u>Section</u>	<u>Page</u>
Section A. Setting and dataset description	1
Section B. Additional descriptive statistics and tests	5
Section C. Description of Composite Barrier recovery score	13



## Section A. Setting and Dataset Description

### *A1. Setting*

Small commercial firms in the United States rely heavily on banks for financing, and prior literature describes a lending framework for this setting that has three dimensions: loan types, borrowing purposes, and lending mechanisms. The loan types and borrowing purposes are very similar to those for public firms. Two primary types of loans exist: commercial and industrial (C&I) and commercial real estate (CRE). C&I loans include lines of credit to address seasonality and working capital financing and term loans for equipment and general business financing. The former generally have maturities of less than one year, whereas the latter have maturities greater than one year. CRE loans are typically long-term mortgages to purchase buildings and land. Lending mechanisms are the technologies used to mitigate adverse selection and moral hazard problems associated with making and monitoring loans. The common lending mechanisms, including financial statements, collateral, and relationships, are also similar for public firms, but with less emphasis on financial reporting.

Multiple banking literature surveys (e.g., Gup and Kolari [2005], Berger and Udell [2006], Freixas and Rochet [2008], and Degryse, Kim, and Ongena [2009]) as well as regulator documents (e.g., OCC [2001]) portray broad heterogeneity in the combinations of loan types, borrowing purposes, and lending mechanisms in this setting. In other words, no one loan mechanism is used exclusively for any one loan type. For example, lines of credit are generally assumed to be collateralized by working capital assets, but this is not necessarily the reality; by definition, CRE loans are collateralized by real estate assets, but other assets can cross-collateralize these loans; term loans can be used to purchase equipment, but can also be financed based on the firm's cash flows (i.e., uncollateralized). Similar to collateral, relationship and financial reporting mechanisms can be used across all loan types. A key conclusion of Berger and Udell [2006] is that banks and borrowers consider a combination of all these mechanisms across loan types.

### *A2. Dataset description*

Sageworks, Inc. graciously provided us proprietary data from the Sageworks Loan Administration (SLA) package for the purposes of examining the monitoring of small commercial firms.<sup>1</sup> SLA is an online cloud based tool that allows banks to record and track details about each loan. From the bank's perspective, SLA automates the collection of borrower information and facilitates the loan review process. In addition to providing these organizing features, SLA is a compliance tool facilitating a bank's regulatory review process. Regulators require banks to maintain risk assessment and monitoring practices. For example, the Office of the Comptroller of the Currency states that risk management practices should "form the foundation for credit risk measurement, monitoring, and reporting, and it should support management's and the board's decision making" [OCC 2001]. The SLA system provides data to guide the bank's credit measurement and monitoring activities across the portfolio of loans, and provides documentation necessary for banks to prove compliance with stated practices to regulators.

---

<sup>1</sup> This product was formerly called "Sageworks Monitor." See <http://web.sageworks.com/loan-administration/> for additional information about the product.

From the econometrician’s perspective, SLA contains the set of ongoing financial and non-financial reporting requirements that the bank and borrower agree to in the form of a collection schedule. Because SLA is an ex ante scheduling program, we observe a static “snapshot” of the information each bank requests from each borrower, and this information does not vary over the life of the loan. Thus, although we have historical data in the sense of when the loans were originated, we do not have a dynamic panel of loans or information requests. We also do not observe loan outcomes such as delinquencies and defaults, preventing us from investigating how monitoring activities are associated with loan performance. We received the dataset in two separate files: a loan file (with anonymized bank, borrower, and loan identifiers and terms of the loan) and a correspondence file (with anonymized bank and borrower identifiers and all information request activity).

To demonstrate the nature of the data, we present an illustrative loan in Figure A1 below. Most variables require little explanation beyond the definitions provided in Appendix A of the paper; however the “document name,” “collateral description,” and “risk rating” fields require additional discussion. These fields are free-form text, meaning SLA users are allowed discretion over what (if any) information to input into the dataset. This discretion results in frequently missing observations or textual inputs that are likely informative to the banker, but difficult for us to decipher (e.g., the use of acronyms or identification numbers). The “document name” field (which is the primary focus of our paper and the main reason for the initial creation of SLA) has the fewest issues. Most document requests are sufficiently descriptive (and often standardized, such as “business financial statements” or “business tax returns”) that our manual coding process is more effective. Table B1 below reports the various documents that we identified and placed into broad categories.

The “collateral description” field is more frequently missing (44% of the collateralized loans have no description) and has much more varied inputs compared to the document requests field. We identify 1,725 different descriptions of collateral, many of which are indecipherable or contain multiple asset types. As a result, we do not use the collateral description field to conduct cross sectional tests across collateral types, though we believe this area is a fruitful one for future research with more complete data.<sup>2</sup>

Finally, the dataset includes a free form risk rating field. As part of the credit allocation and risk management process, regulators expect banks to assign risk ratings to loan applicants. One might suggest this variable would be a useful proxy for a borrower’s credit reputation instead of the credit spread variable we use in the paper; however, this variable has a number of theoretical and empirical issues. Discussions with bankers suggest this variable does not fully capture credit reputation as well as credit spread. Typically, the risk rating is assigned based on a loan’s

---

<sup>2</sup> In Table B2 we conduct a robustness test in which we explicitly control for collateral in the form of guarantees. For example, we find SBA guarantees in 5.7% of sample loans, which is similar to the overall rate of 5.2% of US loans (Dilger [2013]). A potential concern one might have surrounding loans with SBA guarantees is that the program distorts lenders’ incentives to monitor. Several factors mitigate the importance of this concern to our study, however. First, as indicated by the 5.2% statistic, loans originated under SBA programs comprise a very small fraction of overall C&I loans outstanding. Second, even in the presence of an SBA guarantee, lenders have incentives to monitor borrowers because not doing so threatens future participation in the program. Moreover, lenders incur the first losses on SBA loans, and the government only reimburses them for losses up to a maximum percentage per the SBA guarantee. Because the collateral description field is noisy, the guarantor indicator variable used in Table B2 is also noisy, and we suggest future research investigate the different types of collateral.

perceived risk based on generic features such as loan type and borrower industry. The credit spread takes this rating into account, but then the bank adjusts the spread based on the borrower's specific credit reputation and ability to attract financing from other banks based on that reputation. Therefore, the spread identifies this additional component of credit reputation missing in the risk rating. Moreover, risk rating does not mitigate endogeneity concerns. Like the credit spread, the risk rating is assigned after consideration of other loan contract terms (such as collateral, financial statement provision, etc.). Thus, as a theoretical construct, the risk rating misses an element of borrower reputation and does not resolve endogeneity issues.

The variable also suffers from empirical issues. First, it is missing for 31% of loans in the dataset. Second, no consistent ratings systems exist across (or, even in some cases, within) banks. Therefore, empirically inferring the direction and magnitude of the rating is difficult. Finally, bankers suggested to us that little usable variation might exist in this variable. Bankers first discern whether a borrower is "lendable" and then assign a middle-of-the-road rating to the borrower and do not expend much effort in finely partitioning the variable. This bears out in the data—despite having inconsistent rating systems across banks, more than half of the loans for which there is a risk rating have a rating of "3" in the dataset. On a 10 point rating scale that we gained access to from one bank, this number indicates a rather generic imperfect lendable loan.

## Figure A1: Illustrative Loan

This figure presents an illustrative loan from the SLA dataset. This figure is an “idealized” loan because all data fields in this illustration are completed with decipherable information. In the actual dataset provided to us, fields often have missing data or, because the fields are free form allowing bankers to input open-ended text, have text that we are unable to specifically decipher. The Collateral Description and Risk Rating fields most frequently have this issue.

### Loan Terms

Bank Identifier	****0517
Borrower Identifier	****7245
NAICS	112320
Loan Identifier	****4185
Loan Type Code	4 (C&I)
Origination Date	9/1/2009
Interest Rate	5.15%
Collateral	Yes
Collateral Description	missing
Loan Amount	\$220,000
Maturity	48 months
Variable Rate?	No
Risk Rating	4

### Correspondence Record

<u>Bank Identifier</u>	<u>Borrower Identifier</u>	<u>Correspondence Date</u>	<u>Due Date</u>	<u>Received Date</u>	<u>Document Name</u>	<u>Channel</u>	<u>Request Type</u>
****0517	****7245	3/1/2013	4/15/2013	4/25/2013	Annual financial statements	Email	Initial Request
****0517	****7245	4/20/2013	4/15/2013	4/25/2013	Annual financial statements	Email	Past Due
****0517	****7245	4/20/2013	4/15/2013	4/25/2013	Annual financial statements	Letter	Past Due
****0517	****7245	4/1/2013	5/1/2013	5/31/2013	Business tax return	Email	Initial Request
****0517	****7245	5/15/2013	5/1/2013	5/31/2013	Business tax return	Phone	Past Due
****0517	****7245	5/15/2013	5/1/2013	5/31/2013	Business tax return	Email	Past Due

## Section B. Descriptive Statistics and Robustness Tests

**Table B1: Correspondence Summary**

This table tabulates the document requests that banks make to borrowers after a loan has been originated. To create this table, we manually coded 697 unique document requests into the broad categories presented in column 1. Column 2 provides examples of the requests within each category. Column 3 reports the percentage of loans with a given request type category. Business financial statements are the most commonly requested documents, followed by business tax returns, insurance documents, and owner personal information. Columns 4 and 5 partition the sample by loan type. The document requests for C&I loans (column 4) and CRE loans (column 5) are generally similar. Banks request insurance documents at a slightly higher rate for C&I loans, whereas banks request tax returns, other financial information, and appraisal reports slightly more frequently for CRE loans.

(1)	(2)	(3)	(4)	(5)
Request Type	Description	All % Loans	Conditional on type	
			% C&I Loans	% CRE Loans
Business Financial Statement	Business financial statements	50.6%	50.1%	51.7%
Business Tax Return	Business tax return	42.9%	41.9%	44.9%
Insurance	Hazard, title, or other insurance	36.2%	37.6%	33.3%
Personal Information	Personal tax returns or personal financial statements	24.2%	23.3%	26.1%
Other Financial Information	Financial information other than complete financial statements such as receivables aging, budgets, equipment listings	15.1%	13.4%	18.9%
Contingent Rights	Records ensuring bank's position in default, such as lien perfections or UCC filings	11.9%	11.6%	12.4%
Documentation	Records such as deeds, vehicle titles, and property titles	5.2%	4.8%	6.3%
Appraisal	Appraisal or inspection report	1.9%	0.4%	5.0%
Consent	Approval documents with such names as "approval authority" or "borrowing authorization"	1.1%	1.3%	0.7%
Guarantor	Records acknowledging guaranty	0.4%	0.4%	0.4%
Compliance	Records demonstrating compliance with borrowing agreement	0.2%	0.4%	0.0%

**Table B2: Determinants of Financial Statement Requests: Specification Robustness**

This table provides a robustness analysis of our results examining the determinants of financial statement requests in Table 4 of the paper. Column 1 uses a logit specification. Column 2 uses a continuous measure of the credit spread instead of a quintiled version. Column 3 limits the sample to loans not missing an industry code. Columns 4 and 5 include a variable to control for the presence of a guarantor on the loan. The dependent variable for columns 1-4 and 5 are Business Financial Requests and Interim Financial Requests, respectively. See the Appendix A in the paper for variable definitions. Reported below the coefficients are t-statistics calculated with standard errors clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Business Financial Request	Business Financial Request	Business Financial Request	Business Financial Request	Interim Financial Request
Log Relationship Length	-0.131** [-2.23]	-0.036*** [-3.04]	-0.057*** [-3.14]	-0.034*** [-2.89]	-0.008 [-1.09]
Credit Spread Quintile	0.455*** [2.87]		0.059 [1.24]	0.063** [2.05]	0.048*** [3.02]
Credit Spread Quintile <sup>2</sup>	-0.067*** [-2.71]		-0.009 [-1.21]	-0.010** [-2.14]	-0.008*** [-3.33]
Credit Spread		0.026** [2.27]			
Credit Spread <sup>2</sup>		-0.004** [-2.19]			
Multiple Loans	0.268*** [2.92]	0.049*** [2.85]	0.059** [2.27]	0.049*** [2.87]	0.014 [1.32]
Has Collateral	-0.198** [-2.30]	-0.012 [-0.68]	-0.011 [-0.41]	0.002 [0.12]	0.026** [2.00]
Business Tax Return Request	0.678*** [7.09]	-0.090*** [-3.49]	-0.092** [-2.23]	-0.083*** [-3.19]	0.009 [0.61]
Log Non-Financial Requests	-0.312*** [-8.13]	-0.026*** [-2.79]	-0.003 [-0.21]	-0.028*** [-2.96]	0.042*** [5.58]
Log Loan Amount	0.191*** [5.65]	0.039*** [5.89]	0.028*** [2.80]	0.038*** [5.81]	0.030*** [7.00]
Log Maturity	-0.017 [-0.48]	-0.014* [-1.84]	-0.023** [-2.00]	-0.014* [-1.82]	-0.007* [-1.83]
Variable Rate	0.031 [0.35]	0.020 [1.04]	-0.016 [-0.56]	0.023 [1.20]	0.038*** [3.20]
Line of Credit	-0.038 [-0.28]	-0.016 [-0.62]	0.001 [0.02]	-0.017 [-0.66]	-0.016 [-1.02]
CRE Loan	0.027 [0.26]	-0.092*** [-3.17]	-0.015 [-0.46]	-0.096*** [-3.33]	-0.096*** [-4.72]
Guarantor				-0.105*** [-2.82]	0.129*** [4.24]
Specification	Logit	OLS	OLS	OLS	OLS
Fixed Effects	Time	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry
N	4,518	4,518	1,964	4,518	4,518
adj. R-sq		0.413	0.419	0.415	0.530
Sample	All	All	Loans not missing Industry code	All	All

**Table B3: Determinants of Financial Statement Requests: Sample Robustness**

This table provides robustness analysis of our Table 4 results examining the determinants of financial statement requests. Column 1 excludes observations from two banks in our main analyses that do not collect information for the majority of their loans. Column 2 also excludes observations from these two banks, but includes loans from other banks with no correspondence, which we excluded from our main analyses. Column 3 includes loans missing correspondence from all banks. See Appendix A in the paper for variable definitions. Reported below the coefficients are t-statistics calculated with standard errors clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

	(1) Business Financial Request	(2) Business Financial Request	(3) Business Financial Request
Log Relationship Length	-0.033*** [-2.78]	-0.036*** [-3.10]	-0.026*** [-2.67]
Credit Spread Quintile	0.057* [1.81]	0.064** [2.06]	0.039 [1.52]
Credit Spread Quintile <sup>2</sup>	-0.009* [-1.90]	-0.009* [-1.96]	-0.006 [-1.56]
Multiple Loans	0.048*** [2.69]	0.048*** [2.80]	0.033** [2.17]
Has Collateral	-0.012 [-0.65]	-0.024 [-1.35]	-0.028 [-1.58]
Business Tax Return Request	-0.089*** [-3.42]	-0.084*** [-3.27]	0.005 [0.21]
Log Non-Financial Requests	-0.012 [-1.37]	-0.026*** [-2.74]	0.018** [2.26]
Log Loan Amount	0.036*** [5.23]	0.038*** [5.84]	0.034*** [5.65]
Log Maturity	-0.025*** [-2.62]	-0.020** [-2.23]	-0.024*** [-2.86]
Variable Rate	0.020 [1.05]	0.022 [1.19]	0.024 [1.38]
Line of Credit	-0.048* [-1.71]	-0.034 [-1.26]	-0.043* [-1.73]
CRE Loan	-0.093*** [-3.23]	-0.083*** [-2.97]	-0.059** [-2.40]
Fixed Effects	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry
N	4,291	4,624	5,473
adj. R-sq	0.407	0.414	0.431
Sample	Excluding two banks with data issues	Excluding two banks with data issues, but include all other loans with no info request	Include all loans with no info requests

## Table B4: Univariate Correlations

This table provides the Pearson correlations for the variables used in our analysis. Correlations with Interim Financial Request are conditional on business financial statements being requested at least annually. This table includes 4,518 observations. See Appendix A in the paper for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Business Financial Request											
(2) Interim Financial Request											
(3) Log Relationship Length	-0.10	-0.08									
(4) Credit Spread	0.01	0.02	-0.30								
(5) Multiple Loans	0.04	-0.02	-0.01	0.10							
(6) Has Collateral	0.02	0.19	-0.08	0.07	-0.10						
(7) Business Tax Return Request	0.20	0.21	-0.12	-0.06	0.04	0.01					
(8) Log Non-Financial Requests	-0.21	0.08	0.13	0.00	0.13	-0.21	-0.13				
(9) Log Loan Amount	0.13	0.25	0.01	-0.24	-0.11	0.16	0.12	-0.06			
(10) Log Maturity	0.04	0.27	-0.02	-0.01	-0.06	0.24	0.13	-0.13	0.17		
(11) Variable Rate	0.05	0.29	0.02	-0.25	-0.09	0.06	0.19	-0.06	0.18	0.20	
(12) Line of Credit	-0.02	-0.04	-0.03	-0.05	0.03	-0.18	-0.04	0.04	-0.12	-0.71	0.00
(13) CRE Loan	0.01	-0.34	0.15	-0.11	-0.06	0.04	0.03	-0.01	0.17	0.15	-0.03



**Table B5: Financial Statement Requests by Industry**

This table summarizes the business financial and tax return request rates by 2-digit NAICS industry. The industry field is reported for 1,954 observations and missing for the remaining 2,554 observations.

NAICS (two digit)	Industry	Business Financial Request	Tax Return Request	N
11	Agriculture, Forestry, Fishing and Hunting	86%	47%	181
21	Mining, Quarrying, and Oil and Gas Extraction	67%	22%	12
22	Utilities	100%	50%	4
23	Construction	45%	75%	197
31	Manufacturing- Food and Apparel	7%	41%	15
32	Manufacturing- Chemical	51%	40%	39
33	Manufacturing- Machinery and Metal	32%	41%	28
42	Wholesale Trade	38%	39%	74
44	Retail Trade- Speciality Stores	49%	35%	145
45	Retail Trade- General Merchandise	46%	39%	28
48	Transportation	32%	43%	53
49	Warehousing	0%	64%	2
51	Information	25%	0%	4
52	Finance and Insurance	40%	25%	50
53	Real Estate	55%	24%	614
54	Professional, Scientific, and Technical Services	40%	43%	78
55	Management of Companies and Enterprises	83%	37%	6
56	Administrative and Other Services	21%	100%	42
61	Educational Services	50%	24%	12
62	Health Care and Social Assistance	43%	25%	97
63	Arts, Entertainment, and Recreation	50%	34%	22
65	Accommodation and Food Services	33%	0%	120
	Other	47%	100%	141
	Missing industry code	51%	23%	2,554

**Table B6: Determinants of Financial Statement Requests by Loan Type**

This table reports our Table 4 results examining the determinants of financial statement requests after partitioning the sample by loan type. Columns 1 and 2 (3 and 4) restrict the sample to C&I (CRE) loans. See Appendix A in the paper for variable definitions. Reported below the coefficients are t-statistics calculated with standard errors clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

	(1) Business Financial Request	(2) Interim Financial Request	(3) Business Financial Request	(4) Interim Financial Request
Log Relationship Length	-0.017 [-1.27]	-0.022** [-2.12]	-0.073*** [-3.06]	0.004 [0.72]
Credit Spread Quintile	0.004 [0.12]	0.060*** [2.60]	0.076 [1.42]	-0.005 [-0.36]
Credit Spread Quintile <sup>2</sup>	-0.003 [-0.54]	-0.011*** [-3.13]	-0.008 [-0.94]	0.002 [0.67]
Multiple Loans	0.037* [1.86]	0.017 [1.29]	0.076** [2.45]	0.009 [1.05]
Has Collateral	-0.007 [-0.33]	0.045*** [2.65]	-0.014 [-0.39]	0.015 [0.82]
Business Tax Return Request	-0.061** [-2.07]	0.050*** [2.58]	-0.132*** [-2.70]	-0.013 [-1.12]
Log Non-Financial Requests	-0.026** [-2.43]	0.053*** [5.78]	-0.026 [-1.36]	0.005 [0.61]
Log Loan Amount	0.044*** [5.65]	0.036*** [6.71]	0.023* [1.89]	0.003 [0.63]
Log Maturity	-0.004 [-0.40]	-0.014** [-2.17]	-0.014 [-1.28]	0.000 [-0.08]
Variable Rate	0.013 [0.62]	0.048*** [3.42]	-0.032 [-0.81]	-0.004 [-0.28]
Line of Credit	0.005 [0.15]	-0.035* [-1.85]		
Fixed Effects	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry
N	3,099	3,099	1,419	1,419
adj. R-sq	0.434	0.542	0.404	0.285
Sample	C&I Loans Only	C&I Loans Only	CRE Loans Only	CRE Loans Only

**Table B7: State Repossession Laws and Interim Financial Statement Requests**

This table provides robustness analysis of our Table 6 results examining the relation between interim financial requests and collateral. Panel A reports the frequency of loan collateralization partitioned by states with high and low *Recovery Barrier Score*. Consistent with the hypothesis that recovery barriers reduce the value of collateral, this table shows that loans in high recovery barrier states are less frequently collateralized. One may be concerned that the higher reported collateral rates in the low recovery barrier states may be a result of higher collateral reporting rates in the database (rather than higher collateralization). That is, banks located in states in which collateral is more valuable may be more concerned about tracking the collateral. This concern is not an issue for our results because our coefficient of interest is a diff-in-diff coefficient (i.e., the difference in interim financial reporting requests for collateralized relative to uncollateralized loans across low versus high recovery barrier states). Moreover, Panel B presents the results after conditioning the sample on various partitions. Column 1 (2) limits the sample to loans in low (high) recovery barrier states. Column 3 (4) limits the sample to loans *with collateral* in low (high) recovery barrier states. Column 5 interacts the *Has Collateral* variable with the *Recovery Barrier Score* (high scores imply greater barriers to recovering collateral in default). See Appendix A in the paper for variable definitions. Reported below the coefficients are t-statistics calculated with standard errors clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

**Panel A**

	Recovery Barrier		
	High	Low	Diff
HasCollateral	26%	62%	37% ***

**Panel B**

	(1) Interim Financial Request	(2) Interim Financial Request	(3) Interim Financial Request	(4) Interim Financial Request	(5) Interim Financial Request
Has Collateral	0.071*** [3.02]	0.006 [0.31]	0.088*** [2.97]	-0.020 [-0.61]	0.076*** [3.22]
Has Collateral * Recovery Barrier Score					-0.023 [-1.53]
Fixed Effects	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry	Time, Bank, Industry
N	1,361	2,701	965	1,149	4,062
adj. R-sq	0.610	0.225	0.635	0.353	0.529
States	Low recovery barrier	High recovery barrier	Low recovery barrier	High recovery barrier	All
Loans	All	All	Conditional on requesting F/S	Conditional on requesting F/S	All

**Table B8: Determinants of Financial Statement, Tax Return, and Non-Financial Information Requests**

This table uses our main specification (equation 1 in the paper) to examine the determinants of different types of information requests. Column 1 repeats our main results for business financial requests to facilitate comparison. The dependent variable in column 2 is an indicator for whether the bank requests a tax return, and column 3 provides the p-value for differences in the coefficients in columns 1 and 2. The dependent variable in column 4 is a score measuring the scope of reporting to the bank. The Reporting Score equals 3 when the bank requests both financial statements and tax returns, 2 when it requests only financial statements, 1 when it requests only tax returns, and 0 when it requests neither financial statements nor tax returns. The dependent variable in column 5 is the log number of non-financial requests. See Appendix A in the paper for variable definitions. Reported below the coefficients are t-statistics calculated with standard errors clustered at the firm level. \*, \*\*, \*\*\* indicate significance at the two-tailed 10%, 5% and 1% levels, respectively.

	(1) Business Financial Request	(2) Tax Return Request	(3) (1)-(2) difference (p-value)	(4) Reporting Score	(5) Log Non-Financial Request Count
Log Relationship Length	-0.029** [-2.52]	-0.065*** [-5.70]	<i>0.021</i>	-0.124*** [-4.62]	-0.055* [-1.72]
Credit Spread Quintile	0.055* [1.76]	0.006 [0.19]	<i>0.268</i>	0.115* [1.66]	0.008 [0.10]
Credit Spread Quintile <sup>2</sup>	-0.008* [-1.75]	-0.003 [-0.55]	<i>0.397</i>	-0.019* [-1.83]	0.004 [0.37]
Multiple Loans	0.046*** [2.66]	0.039** [2.19]	<i>0.794</i>	0.131*** [3.55]	0.334*** [7.24]
Has Collateral	-0.016 [-0.88]	0.051*** [2.68]	<i>0.018</i>	0.019 [0.52]	0.009 [0.19]
Business Tax Return Request					-0.208*** [-3.47]
Log Non-Financial Requests	-0.023** [-2.47]	-0.031*** [-3.49]	<i>0.569</i>	-0.077*** [-3.77]	
Log Loan Amount	0.038*** [5.76]	0.002 [0.36]	<i>0.000</i>	0.079*** [5.49]	0.050*** [2.63]
Log Maturity	-0.015* [-1.86]	0.000 [-0.06]	<i>0.182</i>	-0.029* [-1.68]	0.002 [0.12]
Variable Rate	0.012 [0.61]	0.064*** [3.35]	<i>0.070</i>	0.088** [2.14]	-0.091* [-1.82]
Line of Credit	-0.018 [-0.66]	0.004 [0.17]	<i>0.569</i>	-0.031 [-0.55]	0.009 [0.13]
CRE Loan	-0.094*** [-3.18]	0.032 [1.24]	<i>0.004</i>	-0.156*** [-2.74]	0.020 [0.28]
Fixed Effects	Time, Bank, Industry	Time, Bank, Industry		Time, Bank, Industry	Time, Bank, Industry
N	4,518	4,518		4,518	4,518
adj. R-sq	0.408	0.390		0.525	0.439

## **Section C: Description of Recovery Barrier Composite Score**

This section details the calculation of the Recovery Barrier composite score used in our cross sectional tests. It contains four figures:

Table C1: Variable descriptions

Table C2: Variables by state

Table C3: Correlations between state variables

Figure C1: Map of states and composite scores

**Table C1: Variable Descriptions**

This section describes the state variables we use to construct our Recovery Barrier composite score and provides sources for our data.

<i>Variable</i>	<i>Description</i>
Judicial Procedures State	An indicator equal to 1 if the bank is headquartered in a state where it must go through a court to initiate a mortgage foreclosure, and 0 otherwise. The judicial foreclosure process begins with the lender filing a lawsuit and recording a notice in the public land records announcing a claim on the property. The lawsuit describes the liability and default, and asks the court to permit the lender to foreclose its lien and take possession of the property as remedy for non-payment. The defendant (borrower) is served notice of the complaint, and permitted to contest the facts provided by the lender. If the defendant demonstrates that differences of material facts exists, the court will hold a trial to determine if foreclosure should occur. In 22 states, judicial procedures are the primary way to foreclose: Connecticut, Delaware, Florida, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Vermont, and Wisconsin (Mortgage Bankers Association, n.d.). In the remaining states, foreclosure is typically handled outside the judicial process. Mortgage contracts give lenders the “power-of-sale” in the event of default. The borrower is sent notice of the default, and may cure the debt during a prescribed period. If the debt is not cured, the court will authorize a sheriff’s sale where the property is sold in auction to the highest bidder. The judicial law process is more bureaucratic and time consuming than the power-of-sale process (Brown, Ciochetti, and Riddiough [2006]; Mian, Sufi, and Trebbi [2014]).
Process Period	The average length of the foreclosure process in the state of the bank’s headquarters, measured in days. The period is measured from pre-foreclosure through to bank ownership of the property, and is compiled from Realtytrac using county and public records. Data on state process periods are drawn from <a href="http://www.realtytrac.com/foreclosure-laws/foreclosure-laws-comparison.asp">www.realtytrac.com/foreclosure-laws/foreclosure-laws-comparison.asp</a> Date of access: February 2, 2015.  If a range is provided (e.g., 170-210 in Delaware), the midpoint is used (190).
Repossession Barrier	An indicator equal to 1 if the bank is headquartered in a state with material exceptions to the “peaceful repossession allowable” standard for collateral. Examples of material exceptions include requirements that the person performing the repossession be bonded for property damage to or conversion of such collateral in the amount of \$25,000.00 (Colorado), that no attempt to enforce the obligation may be made until 20 days after a written notice of right to cure default is given to the consumer debtor (Iowa), that no collateral be recovered through “self- help” repossession (Louisiana), that vehicles cannot be repossessed from property owned or rented by the debtor (Massachusetts), that collateral cannot be taken via entry into a dwelling unless such entry has been

	<p>authorized after default and occurs without the use of force or other breach of peace (Maine), or that the borrower is required to sign a voluntary surrender of collateral or Replevin Judgment granted through legal action for possession of collateral. Data on state laws are drawn from <a href="http://www.creditinfo.com/legal/auto-repossession-laws.shtml">www.creditinfo.com/legal/auto-repossession-laws.shtml</a> Date of access: February 2, 2015.</p>
Recovery Barrier Composite Score	<p>A composite score ranging from 0 to 3 that measures the difficulty of liquidating a borrower. The scale works as follows. The score is the sum of the Judicial Procedures State and Repossession Barrier indicators, plus an indicator equal to 1 if the Process Period is above the median.</p>
Low (High) Recovery Barrier State	<p>An indicator equal to 1 if the bank is headquartered in a state that has a Recovery Barrier composite score less than 2 (greater than 1), and 0 otherwise.</p>

**Table C2: Variables by State**

Below, we present the variables for every state. A confidentiality agreement with Sageworks prevents us from disclosing the location of banks in our sample, though we find significant variation in the composite score components in our sample. All variables are as described in Table C1.

	<i>Judicial</i>				
	<i>Procedures</i>	<i>Process Period</i>	<i>Repossession</i>	<i>State Composite</i>	<i>Low Recovery</i>
	<i>State?</i>	<i>(days)</i>	<i>Barrier?</i>	<i>Score</i>	<i>Barrier State?</i>
Alaska	No	105	No	0	Yes
Alabama	No	49-74	No	0	Yes
Arkansas	No	70	No	0	Yes
Arizona	No	90	No	0	Yes
California	No	117	No	0	Yes
Colorado	No	145	Yes	2	No
Connecticut	Yes	62	No	1	Yes
District of Columbia	No	47	No	0	Yes
Delaware	Yes	170-210	No	2	No
Florida	Yes	135	No	2	No
Georgia	No	37	No	0	Yes
Hawaii	Yes	220	No	2	No
Iowa	Yes	160	Yes	3	No
Idaho	No	150	No	1	Yes
Illinois	Yes	300	No	2	No
Indiana	Yes	261	No	2	No
Kansas	Yes	130	Yes	3	No
Kentucky	Yes	147	No	2	No
Louisiana	Yes	180	Yes	3	No
Massachusetts	No	75	Yes	1	Yes
Maryland	No	46	No	0	Yes
Maine	Yes	240	Yes	3	No
Michigan	No	60	No	0	Yes
Minnesota	No	90-100	No	0	Yes
Missouri	No	60	Yes	1	Yes
Mississippi	No	90	No	0	Yes
Montana	No	150	Yes	2	No
North Carolina	No	110	No	0	Yes
North Dakota	Yes	150	No	2	No
Nebraska	No	142	Yes	2	No



**Table C2: Variables by State (continued)**

	<i>Judicial Procedures State?</i>	<i>Process Period (days)</i>	<i>Repossession Barrier?</i>	<i>State Composite Score</i>	<i>Low Recovery Barrier State?</i>
New Hampshire	No	59	No	0	Yes
New Jersey	Yes	270	No	2	No
New Mexico	Yes	180	Yes	3	No
Nevada	No	116	No	0	Yes
New York	Yes	445	No	2	No
Ohio	Yes	217	No	2	No
Oklahoma	Yes	186	No	2	No
Oregon	No	150	No	1	Yes
Pennsylvania	Yes	270	No	2	No
Rhode Island	No	62	No	0	Yes
South Carolina	Yes	150	Yes	3	No
South Dakota	Yes	150	No	2	No
Tennessee	No	40-45	No	0	Yes
Texas	No	27	No	0	Yes
Utah	No	142	No	1	Yes
Virginia	No	45	No	0	Yes
Vermont	Yes	95	No	1	Yes
Washington	No	135	No	1	Yes
Wisconsin	Yes	290	Yes	3	No
West Virginia	No	60-90	No	0	Yes
Wyoming	No	60	No	0	Yes

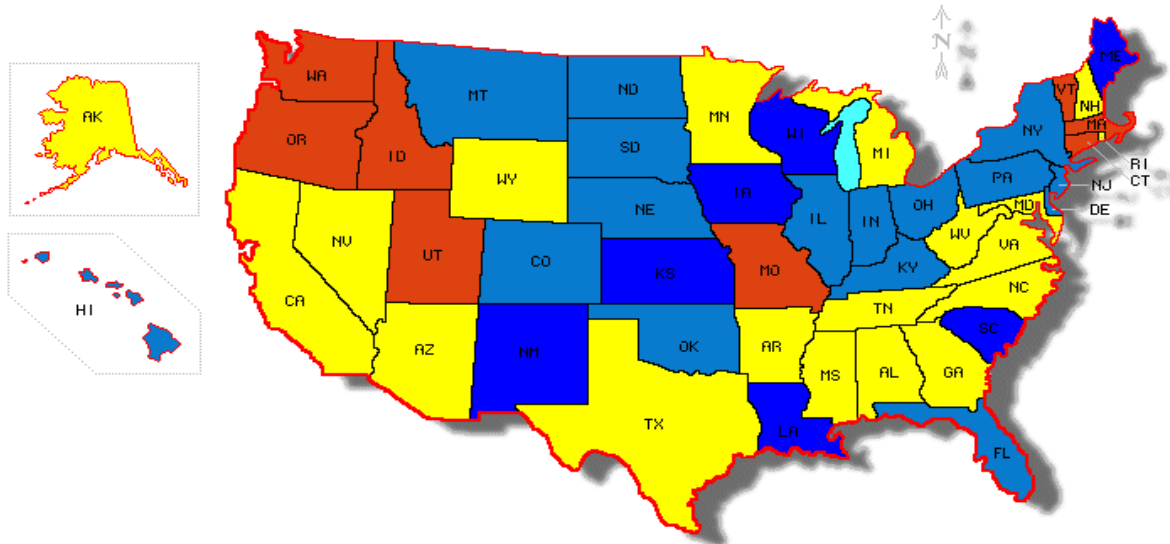
**Table C3: Correlations between State Variables**

The table below presents Pearson correlations between the Recovery Barrier composite score components described in Table C1.

	(1)	(2)	(3)
(1) Judicial Procedures State	1.00		
(2) Process Period	0.17	1.00	
(3) Repossession Barrier	0.68	0.14	1.00

**Figure C1: Map of States and Composite Scores**

- - Recovery Barrier=0
- - Recovery Barrier=1
- - Recovery Barrier=2
- - Recovery Barrier=3



## References

- BERGER, A., and G. UDELL. "A More Complete Conceptual Framework for SME Finance." *Journal of Banking and Finance* 30 (2006): 2945-2966.
- BROWN, D., B. CIOCHETTI, and T. RIDDIOUGH. "Theory and Evidence on the Resolution of Financial Distress." *Review of Financial Studies* 19 (2006): 1357-1397.
- CREDIT INFOCENTER. "Automobile Repossession Laws by State." (n.d.). Retrieved September 16, 2013, from <http://www.creditinfocenter.com/legal/auto-repossession-laws.shtml>.
- DEGRYSE, H., M. KIM, and S. ONGENA. *Microeconometrics of Banking: Methods, Applications, and Results*. Oxford University Press, USA, 2009.
- DILGER, R. "Small Business Administration 7(a) Loan Guaranty Program." Congressional Research Service, R41146. 2013.
- FREIXAS, X. and J.C. ROCHET. *Microeconomics of Banking*. Vol. 2. Cambridge, MA: MIT press, 1997.
- GUP, B. and J. KOLARI. *Commercial Banking*. 3rd ed. John Wiley & Sons. 2005.
- MIAN, A., A. SUFI, and F. TREBBI. "Foreclosures, House Prices, and the Real Economy." *Journal of Finance* 70 (2015): 2587-2634.
- MORTGAGE BANKERS ASSOCIATION. "Judicial versus Non-Judicial Foreclosure." (n.d.) Retrieved September 16, 2013, from <http://www.mbaa.org/files/ResourceCenter/ForeclosusreProcess/JudicialVersusNon-JudicialForeclosure.pdf>
- OFFICE OF THE COMPTROLLER OF THE CURRENCY. "Rating Credit Risk: Comptroller's Handbook." April 2001.
- REALTYTRAC. "Foreclosure Laws and Procedures by State". (n.d.) Retrieved September 16, 2013, from <http://www.realtytrac.com/foreclosure-laws/foreclosure-laws-comparison.asp>