# Common Ownership in the Loan Market

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**Abstract**

Firms and banks increasingly have institutional investors as shareholders in common. These shareholders not only receive profits through interest rates, but also benefit from firm profits. In this paper, I first illustrate the implication of firm and bank common ownership on loans in a simple model. I then provide new evidence of the rise and extent of common ownership between firms and banks. I next show that a firm that borrows from a bank with common owners obtains a lower interest rate and a larger loan. I use the growth of index funds as a source of exogenous variation to estimate a plausibly causal link between common ownership and loan terms not confounded by unobserved factors such as strategic investments by active institutional investors. I find that a one standard deviation increase in common ownership leads to a five basis point interest rate decrease and a three percent loan size increase. I show that these loan terms do not go to underperforming firms but to firms that are less likely to receive a credit rating downgrade. I also find that better loan terms are more pronounced for smaller and unrated firms. This suggests that common ownership benefits may be due to decreased information and monitoring frictions for the lender if their shareholders also have access to firm returns and information.

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# 1 Introduction

In the theoretical and empirical literature on bank credit to firms, the bank and firm are considered separate agents maximizing returns for their respective owners and given their own information set and incentives. However, as institutional investors have consolidated their holdings of both financial and non-financial institutions there is increased potential for lenders and borrowers to have common ownership. In this scenario, a firm and a bank share the interest to maximize revenues for common investors. Specifically, the bank supplies a loan that the firm uses as an input in its production function. Common owners profit both from the returns on the bank's interest rate and from the firm's profit.

Partial common ownership leads to a quasi-vertically integrated enterprise between the firm and bank. In this paper I ask three questions: First, what are current levels of common ownership between banks and firms, and how have these levels evolved over time? Second, does common ownership lead to an effect on the loan terms a firm obtains given its common ownership structure with the bank and, if so, through what channels? Third, who profits from loan terms - are they given to underperforming firms solely based on common ownership and at the expense of other shareholders, or do they remedy information asymmetries?

I analyze common ownership between banks and firms — a previously overlooked feature — through the lens of the vertical integration literature. Theoretically, reasons to integrate firms include reduced transaction costs when these are done within firm instead of across separate ones (Coase, 1937; Williamson, 1975; Williamson, 1979). Under common ownership, a loan is an internal transaction between the firm and bank. In this paper, I study the loan terms and real outcomes that arise when a firm and bank with a loan relationship have common owners to quantify the transaction cost reductions and its channels.

I outline three trends of institutional investors' holdings of public companies overall and how they drive firm and bank common ownership. First, their overall holdings have grown ten-fold in the past 20 years in terms of market value. Over the same time period, the average fraction of a public company they own nearly doubled to almost 60 percent. Second, the fraction owned of firms and banks by common owners has grown when they have a loan relationship. At the time of loan origination, the percentage of firm shares held by institutional investors that also hold bank shares has doubled to nearly 40 percent between 1990 to 2012. Similarly, the percentage of bank shares held by institutional investors that also hold firm shares doubled to nearly 30 percent over the same time span. Third, common owners are persistent in their holdings. Around 90 percent of investors driving common ownership between firms and banks remain as investors in the subsequent year, both in terms of number of investors and as percent of shares held by these recurring investors.

I posit through a simple model that, when a bank and a firm have common ownership, the firm obtains better financing terms from the bank. This occurs because some bank shareholders not only receive profits through interest rates on the loan extended to the firm but also through the firm's profits. To test this prediction, I estimate regressions examining how common ownership is associated with interest rate spreads and loan size after controlling for various firm and bank time-variant and invariant variables. I define common ownership at the time of loan origination in three ways: 1) as an indicator if the bank and firm have at least one institutional investor in common 2) the product of the fraction of firm shares and bank shares held by the institutional investors in common 3) only the fraction of firm shares held by the institutional investors in common.

I find that when a firm and bank have at least one institutional investor in common, the loan has an eight basis point lower interest rate spread and a larger loan size by five percentage points. A one standard deviation in the measures of common ownership percentage is associated with around a six basis point lower interest rate spread and a one percentage point larger loan size. While the controls are exhaustive, there still might be strategic investment in firms and banks that would bias my estimates. Specifically, when banks and firms are performing well, they can offer and obtain, respectively, better loan terms. At the same time, more investors will want to invest in both, leading to a spurious correlation between common ownership and better loan terms.

To overcome such endogeneity, I use plausibly exogenous variation in the common ownership driven by institutional investors: the common ownership driven by major index funds. Analogous to Azar et al. (2016), the index funds I focus on are iShares (currently part of BlackRock, previously managed by Barclays Global Investors), Vanguard's index funds, SPDR (managed by State Street Global Advisers), Invesco's PowerShares, and Fidelity's

Spartan index funds. Index fund ownership is a subset of institutional investor ownership and hence relevant to it.[1] However, they grow — and particularly increase their holdings of public firms and banks — when people invest their savings in them and they allocate their investments based on predetermined rules. The common ownership they create is potentially exogenous to firm and bank characteristics that lead to lower loan rates. Specifically, the common ownership they create is less attuned to any strategic component such as active trading based on institutional investors' distinct and private information about firms and banks.

Using index fund shareholdings as a source of exogenous variation, I find that common ownership between firms and banks leads to lower loan rates and larger loans. A one standard deviation increase in either percentage measure of common ownership leads to around a five basis point decrease in loan rate spreads.[2] Regarding loan size, I estimate that a one standard deviation in the percentage of common ownership leads to between a two and three percentage points increase using the intensive measurements of common ownership. In both quantity and pricing, the common ownership structure with the bank allows the firm to obtain better financial flexibility on their loan terms.

I also analyze the intensive margin of common ownership by restricting the sample to loans where firms and banks have at least some common owners. This is done to ensure results are not solely driven by the functional form of comparing loans given to firms with no common owners with the bank to those with some. I show that common ownership decreases loan rate spreads and increases loan sizes in this restricted sample too and with a larger magnitude. A one standard deviation increase in common ownership leads to a 17 basis point decrease in interest rate spreads when restricting the sample to firms with some positive amount of common ownership with the lending bank. Similarly, a one standard deviation increase in common ownership leads to an increase between five to ten percentage points in loan size.

The observed better loan terms could be given to underperforming firms as banks overlook

[1] Institutional investors may have an active investment and index fund arm such as in the case for Blackrock. In such cases, to construct the instrument I only use the shares held by the index fund.

[2] Results using the extensive measure of common ownership if firms and banks share at least one shareholder cannot be estimated as the instrument does not induce enough variation on the extensive margin where a firm and a bank are connected only through index fund investors.

their flaws solely because they have common owners. This would lead to “sweetheart” deals at the expense of other shareholders. To address if my results are driven by this effect, I study subsequent firm performance after obtaining the loan. If performance decreases, then this is evidence that my results reflect this “sweetheart” phenomena.[3] First, I analyze a firm’s evolution in credit ratings to assess its financial stability related to its ability to meet outstanding debt obligations after obtaining a loan. I find that firms are three percentage points less likely to experience a credit rating downgrade in the year after they obtain a loan when there is a one standard deviation increase in common ownership between the firm and the bank at the time of loan origination.

I also analyze subsequent firm performance based on financial accounting measures. I create indicator functions if the firm increases its profitability and capital expenditures, and if it decreases its employment by more than one percent or sell assets in the year after obtaining a loan from a bank with a common ownership structure. The first two measures capture improvements in firm performance while the second two measures capture if the company goes through downturns affecting its real activity. I find that firms with common ownership with the bank do not appear to increase profits or capital expenditures a year after obtaining a loan from such bank. There does appear to be an increase in the likelihood of decreasing their working force and a decrease in the likelihood of needing to sell assets. But taken together, there is little evidence that better loan terms due to common ownership go to firms that subsequently underperform.

If these better loan terms do not go to underperforming firms, then what might explain why common ownership results in better loan terms? Given the comprehensive literature documenting the importance of asymmetric information and monitoring cost on loan terms, I empirically test whether these channels could explain the benefits of common ownership. In particular, smaller firms with less public information would present larger asymmetric information and monitoring costs. Thus, I decompose my common ownership result by heterogeneity in firm size and credit rating status. By comparing across firm size, I aim to test two mechanisms. First, that the partial vertical integration between firm and banks

[3]Morck and Nakamura (1999) finds that firms in bank groups are “propped up” seemingly at the expense of other shareholders in Japan

could be more relevant for smaller firms with potentially more volatile and uncertain growth prospects. In this case, the ownership of the firm by investors that also own the bank could work as a form of collateral or channel for information flow or monitoring, thereby improving its financing terms in line with information asymmetry models of lending. Second, that the estimated inverse relationship between common ownership and loan rate spreads is not simply due to larger firms being more established, well-known and prone to indexation. This could lead to a mechanical relationship between common ownership and lower (larger) loan rate spreads (loan sizes). In a similar spirit as focusing on small firms, I analyze the heterogeneity by credit rating status. Firms without a public credit rating from Standard and Poor's (S&P) could be harder for banks to assess creditworthiness that common ownership could alleviate.

I find that smaller firms — defined as those below the median in assets by year among firms in my sample — and firms without a S&P rating have a lower rate spread when there is a higher percentage of common ownership. On average, smaller and unrated firms have a higher interest rate than larger and rated firms because their growth prospects are harder to evaluate. The main effect of being a smaller firm on loan rate spreads is around 11 basis points higher while the effect of being an unrated firm is around 70 basis points. The increased loan rate spread is attenuated with common ownership. For small firms, a one standard deviation increase in common ownership lowers loan rates by around ten basis points more than for large firms. Similarly, a one standard deviation increase in common ownership lowers loan rates also by around ten basis points more for unrated firms than for rated firms. Regarding loan size, there is a positive effect of common ownership for smaller and unrated firms but smaller in magnitude compared to the common ownership main effect. These results suggest that banks and firms are more likely to internalize their common ownership structure when considering it as a conduit for better information flow or access to firm returns when setting loan terms.

I conclude my analysis by exploring the relation between the common ownership of each bank in the loan syndicate with the borrowing firm. My previous findings focused on the common ownership between the lead bank in the loan syndicate and the firm. They suggest a firms obtain better loan terms the more common ownership it has with the lead bank. In response, other banks might prefer to not participate in such loan syndicate since it would be associated with a lower interest rate from which they profit. On the other hand, if a bank with high common ownership can alleviate information asymmetries then other banks might be willing to trade-off the associated lower interest rate and let it be the lead bank. In line with the latter hypothesis, I find a small but positive association between common ownership and lead bank choice. A one standard deviation increase in common ownership leads to an increase of between one to two percentage points in the probability the bank is the loan syndicate lead arranger.

This paper combines insights from different strands of the literature to uniquely tie how common ownership between lenders and borrowers impacts the syndicated loan market. The banking literature has long hypothesized how shocks to lenders or how lenders' ability to screen and to monitor influence credit availability.[4]. An underlining feature in each study is to consider both the bank and firm as separate agents that interact only through the loan market. In this paper, I will examine how a common ownership relationship between banks and firms impacts loan terms. To the best of my knowledge, I am the first to relax the assumption banks and firms are separate agents and instead consider them as agents maximizing rents for a common set of institutional shareholders in an empirical setting.[5]

As I consider banks and firms maximizing returns for common owners, my findings relate to the literature studying what constitutes firm ownership and its boundary. This literature analyzes how asset ownership defines bargaining power and hence incentives to control corporate decisions and to integrate with other firms (Grossman and Hart, 1986; Hart and Moore, 1990; Whinston, 2003).[6] It has also been proposed theoretically that vertical integration could be particularly valuable for firms and society in cases where the upstream firm and

[4]While not an exhaustive list, among the mechanisms influencing screening and monitoring capabilities in the loan market, the following have been studied: borrower bank dependency (Schwert, Forthcoming), geographical proximity (Petersen and Rajan, 2002; Brickley et al., 2003; Degryse and Ongena, 2005; Mian, 2006), and relationship length (Sharpe, 1990; Berger and Udell, 1995; Schenone, 2010; Bharath et al., 2011; Botsch and Vanasco, 2017). Among shocks to lenders that can impact lending that have been studied are bank capitalization (Bernanke, 1983; Ivashina and Scharfstein, 2010; Chodorow-Reich, 2014) and monetary policy (Kashyap and Stein, 2000; Jiménez et al., 2014)

[5]Jiang et al. (2010) is similar as it looks at the effects on syndicated loans when both equity and debt claims of the same firm are owned by non-commercial banking and commercial banking institutions. Yet they focus on direct debt claims by the institutional investor while I focus on those done through banks and shareholders shared in common with the firm. Hoshi et al. (1990) analyzes how firms in Japan experience less financial distress when they are part of industrial groups which could include a bank.

[6]See Holmstrom and Roberts (1998) for a comprehensive literature review on the theory of firm boundaries.

downstream firm are monopolies in their respective markets.[7] In this scenario, upstream and downstream firms add their monopoly markup known as a double-marginalization effect. If they instead joined as one, vertically integrated firm they would have higher joint profits, and the end consumer would face lower prices (Tirole, 1988). Yet despite the proposed benefits, the empirical evidence on partial or full vertical integration is sparse.

I also contribute to an emerging literature empirically analyzing the effects of partial common ownership on firm performance. Recent work has established how partial common ownership between firms driven by the growth of institutional investors might increase monopoly power in industries such as airline travel (Azar et al., 2017) and bank deposit products (Azar et al., 2016). It has also analyzed how common ownership can not only impact market behavior between firms but also firms' executives pay (Anton et al., 2017). This literature has shown that there potentially exists anti-competitive behavior among horizontal firms when they act on behalf of a common underlying set of shareholders. I extend this conceptual framework to test it empirically in the loan market where the firms owned by common shareholders — the lender and borrower, respectively — have a vertical relationship that is now partially integrated through the common shareholders. In my setting, I focus on the enterprises that have a relationship where the common shareholders can potentially alleviate information asymmetries and obtain rents directly when lower interest rates on the bank side help carry out investment projects on the firm side. This is in contrast to previous studies where common shareholders obtain rents through competing firms changing prices on their products systematically.[8]

Banks offering favorable terms to firms depending on ownership have been analyzed focusing on personal connections between firm and bank management. It has been shown that firms with clear political ties obtain better pricing from government banks (Khwaja and Mian, 2005). Similarly, firms owned by bank executives also appear to obtain more favorable loan terms (La Porta et al., 2003). Direct common ownership in the United States

[7] In my particular context for this research, the bank is considered the upstream firm providing a product, a loan, that the downstream borrowing firm purchases from it.

[8] Acemoglu et al. (2009) analyzes the determinants of full vertical integration empirically across countries focusing on contracting costs and financial development. I focus my analysis in the United States to show what are the changes in the internal transfers through loans between partially integrated upstream and downstream firms, the bank and borrowing firm, respectively.

has analyzed historically in the earlier part of the 20th century when the number of investors and firms was smaller and bank executives were owners or board members of firms they were lending to concurrently (Kandel et al., 2013; DeLong, 1991). More recently, it has been shown that banks and firms connected through their executives[9] going to college and working previously together leads to more favorable lending terms (Engelberg et al., 2012; Karolyi, Forthcoming). In this research I will show how common ownership through institutional investors carries similar implications. A model taking into consideration the underlying common shareholders can also explain how a firm can be connected to, and can obtain better financing from a bank that has yet not been explored.

To clarify, for the rest of the paper I will refer interchangeably to firms as borrowers. I will do the same referring to banks as lenders. While banks are indeed firms as well, I will not refer to them as such so as to not confuse the reader given the paper's setting. In addition, I will refer to "firms borrowing from banks" or "banks lending to firms" but this should not be interpreted as who has the most agency in the relationship. The mechanism at work analyzed in this paper is the underlying common ownership between firms and banks — not necessarily who borrows from or lends to whom.

The rest of the paper proceeds as follows. Section 2 describes a simple model to motivate the empirical analysis. Section 3 describes the setting and data with an emphasis on showing the growth of institutional investors and its prevalence driving common ownership between firms and banks that have loan relationships. Section 4 describes the methodology and Section 5 the estimation results. Section 6 presents results on potential mechanisms at work and Section 7 a discussion of the overall results. Section 8 concludes.

# 2 Conceptual Framework

I motivate my initial set of empirical analysis from a model in Tirole (2010). There are firms with projects that need one unit of investment. For simplicity, they are not endowed with any initial assets. The project in the good state of the world has a return of $R$ and in the

[9] Kroszner and Strahan (2001) investigates the extent to which bank executives are board members in borrowing firms in the U.S.

bad state returns nothing. There is a probability $\pi$ that the project succeeds. Hence, the expected value of a firm's project is:

$$E(R) = \pi R$$

For markets to exist, I assume $\pi R > 1$. Banks are the only actors that can provide financing for the firm's investment project and are risk neutral. They obtain a fraction of the total return project $R_b$ defined by $R = R_b + R_f$. $R_f$ is defined as the fraction the firms keeps from the overall project returns. As there is perfect competition, banks will lend if:

$$\pi R_b = 1$$

meaning that the expected returns for the bank is equal to the financing amount they provide. Bank returns can be expressed as the one unit loan including interest defined as $R_b = (1+r)$. This leads to the interest rate being set as:

$$(1 + r) = \frac{1}{\pi} \tag{1}$$

giving the usual relation that as a firm's project is less likely to succeed, interpreted with a lower $\pi$, then the bank charges a higher interest rate.

I now introduce common ownership to the previous set-up. With common ownership there exists a fraction $\theta$ of shareholders of the bank that have claims to its profits but that also have a claim to the firm's returns where $0 > \theta > 1$. These common owners have a claim of a $\gamma$ fraction of the firm's returns as that is the percent of the firm they own. In turn, there exists a fraction $(1 - \theta)$ of bank shareholders that only get revenue through the bank and none through the firm's returns. In this new set-up, the bank internalizes common ownership by setting its lending rule:

$$\pi((1-\theta)(1+r^c) + \theta(1+r^c+\gamma R_f)) = 1 \Leftrightarrow$$
$$\pi((1-\theta)(1+r^c) + \theta(1+r^c+\gamma(R-(1+r^c))) = 1$$

where $r^c$ is the interest rate set under common ownership. Re-arranging the previous equation leads to the following interest rate:

$$(1 + r^c) = \frac{1}{1 - \theta\gamma}(\frac{1}{\pi} - \theta\gamma R) \tag{2}$$

When there is no common ownership the expression reduces to Equation (1) as expected. While simple, this model leads to the following hypothesis I will test empirically once common ownership is introduced to a bank's lending decision:

*H1: Under the assumption $\pi R > 1$ for markets to exist, then the interest under common ownership will always be lower with common ownership than with no common ownership: $r^c < r$.*

*H2: As the percentage of common ownership increases from either the shareholders in common owning more of the firm, $\gamma$, or bank, $\theta$, then the interest rate will fall.*

This is given by taking the partial derivatives from Equation (2) such that:

$$\frac{\partial(1 + r^c)}{\partial\theta} = \frac{(1 - \pi R)\gamma}{\pi(1 - \theta\gamma)^2} < 0$$
$$\frac{\partial(1 + r^c)}{\partial\gamma} = \frac{(1 - \pi R)\theta}{\pi(1 - \theta\gamma)^2} < 0$$

since $\pi R > 1$.

Figure 1 plots the relationship between interest rates charged under no common ownership and with common ownership — as measured by $\theta \times \gamma$ — fixing $\pi$ and $R$. As can be seen, with no common ownership the interest rate remains unchanged. However, it is decreasing as $\theta \times \gamma$ — the product of firm and bank shares held by common shareholders — increases.

As observed in Equation (2), the interest rate under common ownership will depend on the total returns of the firm's project, $R$, as well as the overall probability of success $\pi$. This points to why in my empirical section it will be important to control for all possible time-varying variables associated with those characteristics and to introduce a source of variation of common ownership that is exogenous to a firm's project's returns and risk. There is also a scenario where the interest rate can be negative given the assumption that banks are risk neutral and place the weight on returns to common owners and bank-only owners solely based on the percent each group owns of the bank. As we do not observe negative interest rates, this could be fixed by a simple fiduciary constraint that bank shareholders that do not own part of the firm must receive at least some positive return but the model's intuition remains the same.

# 3 Setting and Data

To test the motivating model's hypothesis, my setting is the syndicated corporate loan market focusing on the relationship between the bank acting as the lead arranger and the borrowing firm.[10] The main data sources are standard in the literature and include LPC DealScan, Compustat and Thomson Reuters's SEC 13F filings database. I merge information on corporate loans from DealScan with borrower and lender characteristics in the quarter of loan origination from Compustat to construct a sample of firm-bank-loan observations from 2000 to 2012. Thomson Reuters's SEC 13F filings database helps me determine which borrowers and lenders from loans in LPC DealScan have institutional investors in common.

DealScan provides data for syndicated loans made between a single borrower and a syndicate of lenders. DealScan refers to loans as "credit facilities" which can be either a loan with a specific maturity or a revolving line of credit. The measure of loan price — one of the main outcomes in this research paper — is the all-included drawn spread over LIBOR, which is the price including fees that a firm would pay if it drew upon 100% of its line of credit (for revolving loans) minus the spread over LIBOR including fees for term loans. The data also contains other loan characteristics such as loan size, another main outcome variable, as well as type, purpose, maturity and covenant presence that serve as controls throughout my analysis.

For most of the analysis, I will focus on the common ownership relation between the firm and the bank acting as the lead arranger in the syndicated credit facility. As mentioned in previous studies,[11] the bank acting as the lead arranger has a more active role in originating the loan and monitoring its performance. Hence, I expect common ownership measures

[10] See Sufi (2007) for a comprehensive discussion of the syndicated corporate loan market and lead arranger bank's role.

[11] Schwert (Forthcoming)

between the firm and lead arranger to be the most relevant when defining its role on loan terms. Throughout most of this paper, I will refer to banks as the one acting as the lead arranger for a given loan unless otherwise noted. I define a bank to be a lead arranger if in the DealScan data its role is defined as Arranger, Administrative Agent or Agent.

Building upon previous research, I start the data build with the DealScan-Compustat Link from Chava and Roberts (2008). This table matches loan facilities from DealScan with borrower identifiers in Compustat. This allows me to control for firm time-varying performance measures. Following the literature, I exclude loans to financial companies (SIC between 6000 and 6999) from the sample. To obtain bank identifiers to link to firms with a common set of shareholders and to incorporate bank time-varying controls I use the DealScan-Compustat Bank Link from Schwert (Forthcoming). It provides a lender link table by hand-matching DealScan lender names with Compustat GVKEYs for all lenders with at least 50 loans or at least $10 billion in loan volume. Using Compustat I obtain various firm and bank performance measures that could potentially influence loan pricing and that are standard in the literature. I also use the SDC Platinum database to control for the firm issuing any public debt or equity during the life of the loan.

Thomson Reuters's database of SEC 13F filings provides data on institutional ownership of banks and firms. All institutions that "exercise investment discretion over $100 million or more" must file a Form 13F every quarter with the SEC that provides information on their holdings of US firms' equity. This data set includes institutional holdings for all firms publicly traded in US stock markets. The Thomson-Reuters data identify managers by SEC filing, assigning them a unique manager number. I also use this database to measure index fund ownership from the largest five index funds over time as a potential instrument for overall institutional ownership.

## 3.1 Construction of Common Ownership Variable

A widespread feature in the syndicated corporate loan market overlooked in the literature — and main focus of this research paper — is the degree to which firms and banks are connected through having the same underlying shareholders when a loan is originated between them. Combining information from the Thomson Reuterss SEC 13F and DealScan databases, I can determine which firms and banks with a loan relationship have institutional investors in common as major shareholders. Furthermore, I can construct the percent of firm and bank shares held by common owners.

A main contribution of this paper is to measure if and the extent to which firms and banks have common ownership. As an extensive metric, I first define firms and banks having a common ownership structure as an indicator variable:

$$\text{Connected}_{i(fbt)} = \mathbf{1}\left\{Investors_{i(bt)} \cap Investors_{i(ft)} \neq \emptyset\right\}$$

where $Investors_{i(bt)}$ is the set of institutional investors that hold shares in bank $b$ originating loan $i$ at time $t$. $Investors_{i(ft)}$ represents the equivalent set for shares held in firm $f$. In other words, the indicator variable turns on when there exists any institutional investor that holds a positive amount of shares in both the bank and firm when the loan originates. It intends to capture on the extensive margin if a firm and a bank are connected at all through a non-empty intersecting set of shareholders. Related to the motivating model described in Section 2, this is an indicator when $\theta$ and $\gamma$ are both greater than zero

As my main intensive measure, I define common ownership as the product of the fraction of firm and bank shares held by institutional investors that are shareholders in both concurrently at the time of loan origination. These are the empirical analogues to the $\theta$ and $\gamma$ described in Section 2. More formally, the firm-side component of this measure is defined as:

$$\text{Firm Common Own}_{i(fbt)} = \frac{\sum_n Shares_{i(nft)} * \mathbf{1}\left\{n \in Investors_{i(bt)} \cap Investors_{i(ft)}\right\}}{TotalShares_{i(ft)}}$$

where $Shares_{i(nft)}$ is the number of shares of firm $f$ held by institutional shareholder $n$ at time $t$ for loan $i$. It is summed in the numerator across all institutional shareholders that hold stakes in the firm and the bank when the loan originates as defined by the indicator variable. The total number of firm shares is in the denominator. Firm Common $\text{Own}_{i(fbt)}$ is a measure aiming to capture how much of the borrowing firm do institutional investors have a vested interest in when they also have some ownership of the bank originating the loan. Firm Common $\text{Own}_{i(fbt)}$ is the empirical analogue to the $\gamma$ used in Section 2. I then construct the equivalent measure on the bank side:

$$\text{Bank Common Own}_{i(fbt)} = \frac{\sum_n Shares_{i(nbt)} * \mathbf{1}\{n \in Investors_{i(bt)} \cap Investors_{i(ft)}\}}{TotalShares_{i(bt)}}$$

where $Shares_{i(nbt)}$ is the number of shares held at bank $b$ by institutional shareholder $n$ at time $t$ for loan $i$. It is summed in the numerator across all institutional shareholders that hold stakes in the firm and the bank when the loan originates as defined by the indicator variable. The total number of bank shares is in the denominator. Bank Common Own$_{i(fbt)}$ is the empirical analogue to the $\theta$ used in Section 2. I then define the second measure as:

$$\text{Firm-Bank Common Own}_{i(fbt)} = \text{Firm Common Own}_{i(fbt)} \times \text{Bank Common Own}_{i(fbt)}$$

Under the assumptions that all revenue from the firm and bank goes to shareholders, the product of Firm Common Own$_{i(fbt)}$ and Bank Common Own$_{i(fbt)}$ intends to stand in empirically for the product of $\gamma$ and $\theta$ previously shown to lower rates on loans when common ownership exists. Broadly speaking, I incorporate common ownership to the bank lending rule through a measure weighing the fraction of the firm and bank held by common owners. In other words, it will downweigh cases where a firm is mostly held by institutional investors that have holdings in both the bank and firm, but on the bank side they only hold a small percentage.

As my third and additional intensive measure, I will only use Firm Common Own$_{i(fbt)}$. This will be the empirical analogue of setting $\theta$ equal to one meaning that it tacitly assumes that common shareholders between the firm and bank own all the bank's shares and only part of the firm's shares. This is equivalent to a thought experiment where common owners are can influence corporate lending decision-making at the bank when it sets loan terms for the firm under common ownership. It provides an upper-bound of the common shareholder's bargaining power on the bank side as measured solely through percent of shares owned. This measure can also be interpreted as assuming the most relevant variation is the firm-side common ownership to the degree it allows to learn about the firm and alleviate information asymmetries when common owners exist.

## 3.2 Descriptive Statistics

Table 1 reports the summary statistics for the sample used for the analysis. I use the DealScan loan observations where I am able to merge financial and ownership information of the lead bank and the firm thanks to data tables provided by previous studies. I also ensure that the loan-, bank- and firm=level variables used in the analysis are all non-missing. This leaves me with a sample that includes 15,467 distinct loan facilities. I show the mean, standard deviation, 25th and 75th percentile for the variables measured when the loan originates.

The average loan size in the sample is about $337 million with around a 4-year maturity. Such loan size represents on average close to a fifth of the borrowers total assets. The interest rate spread average is nearly 200 basis points with a standard deviation of 132 basis points. Nearly a fifth of loans are intended for working capital and a tenth are revolving credit facilities while ten percent are revolving.

The average firm in my sample has a little over $4 billion in assets. The mean of cash holdings these firms carry is 20 percent of total assets. The relationship length since the time of first origination within my sample time frame is about three years. The banks in my sample are large. On average they carry over $300 billion in assets. To proxy for bank capitalization I use deposits over total assets ratio, Tier 1 Capital ratio and total non-performing assets over total assets ratio. Tier 1 Capital ratio is a measure of assets banks can quickly redeem over a risk-adjusted measure of its total assets and is followed to regulate banks according to the Basel Accord. In my sample its average is almost ten percent. For deposits over total assets ratio, this measure is almost 50 percent.

Regarding common ownership, 60 percent of loans have the case where the bank and firm share at least one institutional investor in common at the time of loan origination. The average percentage of firm shares held by institutional investors that also have bank holdings at the time of loan origination is 28 percent. This is the average for the empirical analogue of $\gamma$ from the model in Section 2. My main measure of common ownership, the product of firm and bank percentages held by institutional investors in common is 11 percent. This is the average for the empirical analogue of the product of $\gamma$ and $\theta$ from the model described above. As around 40 percent of loan observations have no common ownership between firms and banks, the 25 percentile for all my common ownership measures is zero. In the analysis below I will interpret my estimates based on standard deviation increases for the intensive measures of common ownership. The standard deviation for the product of firm and bank percentages held by institutional investors in common is 15 percent while for the percentage of firm shares held by institutional investors that also have bank holdings the standard deviation is 31 percent.

## 3.3 Common Ownership Trends

Common ownership between a firm and bank with a loan relationship has become more likely given the ever-growing presence of institutional investors that hold large and diversified portfolios. On the left axis, Figure 2 shows the market value of the shares owned by institutional investors using the number of shares owned and price per stock at the end of year as reported in the Thomson Reuters's SEC 13F filings and Compustat databases from 1990 to 2012. I restrict the sample to firms and banks that appear at some point in my sample used from DealScan. On the right axis, I show the average fraction of a public company's stock that is owned by institutional investors. The growth of institutional investors has been continuous over the time span I focus in this study. The growth in the market capitalization of shares institutional investors own has grown ten-fold to over one trillion dollars by 2012. Meanwhile, the average fraction of company shares owned by institutional investors has doubled to around 60 percent.

This growth of institutional investors in the financial markets has led to a stark increase in common ownership between borrowers and lenders at the time of loan origination. To fix ideas, in Table 2 I show a specific example. In 2012Q1 there was a loan origination between the bank Wells Fargo and the firm Petsmart. For this particular quarter, I show the top ten institutional investors by the fraction owned of each company. In bold, the investors that appear in common are: Vanguard, Fidelity, State Street, Blackrock and Wellington Management. For both companies considering only the largest ten shareholders, common owners hold over 15 percent of shares. Using the common ownership measures described above, I examine this type of relationship across all investors in the firm and bank. Throughout this paper, I consider that firm and bank decision-makers are well aware of such ownership stakes as they are economically meaningful and take them into consideration as their objective is to maximize shareholder value.

To show visually differences in common ownership across time and firms, I present heatmaps in Figures 3 through 5. In these heatmaps I show the intensity of common ownership as measured by Firm-Bank Common $\text{Own}_{i(fbt)}$ ($\theta \times \gamma$ empirical analogue) between two banks — Bank of America and JP Morgan — and eighteen firms in 2004Q1 and 2011Q1. These firms and banks have a loan relationship at some point in the data used for this analysis although not necessarily in the quarters I show. In Figures 3 and 4, a darker shade in the heatmaps describes a higher common ownership between the bank and firm. There is a wide variation in this percentage for both quarters in the cross-section with some firms and banks having no common ownership. Figure 5 shows how common ownership changed over time between both quarters. Moving from red to blue in the heatmap shows decreases to increases in the common ownership percentage between these particular banks and firms from 2004Q1 to 2011Q1. Most firms and banks intensify their common ownership in the positive direction. This is consistent with an overall growth in institutional investor holdings across all companies on average.

While the previous figures and tables portray specific examples, in Figure 6 I show the fraction of firm and bank shares held by common owners. Each fraction is measured at the time of a loan origination between them as reported in the DealScan data. These represent the measures Firm Common $\text{Own}_{i(fbt)}$ and Bank Common $\text{Own}_{i(fbt)}$ described above. There is a continuous rise in common ownership over time. The percent of firm shares held by common owners is always higher than its bank counterpart. From 1990 to 2012, the common ownership at the time of loan origination for firms, Firm Common $\text{Own}_{i(fbt)}$ ($\gamma$ empirical analogue), starts around 20 percent but nearly doubles to 40 percent by the end. Bank common ownership, Bank Common $\text{Own}_{i(fbt)}$ ($\theta$ empirical analogue), starts slightly below 20 percent but rises to almost 30 percent by the end.

The growth in common ownership is driven by institutional investors that are recurring in consecutive years. This shows my common ownership measures do no mask large strategic investing swings since investors in both firms and banks do not change their positions extensively and actively. In Figure 7 I plot, for the first quarter in each year, the percent of common owners that were also common owners at some point in the previous year. Similarly, in Figure 8 I plot the percent of shares of firms and banks held by common owners. In these figures, I use firm and bank pairs that have a loan relation at some point in my analysis sample.

The pattern in both figures strikingly shows that most investors are likely to keep their investment holdings in any given year. Around 85 percent of a firm's or bank's common owners also reported being common owners in the previous year. The percentage is higher in terms of shares held by these investors. Around 90 percent of a firm's or bank's shares under common ownership are held by shareholders that also reported being common owners in the previous year. There appears to be more variability in the series for banks than for firms but the overall pattern remains largely the same for both.

In Figure 9, I show a Kaplan-Meier survival plot for investors in firms and banks where the time variable is quarters. It shows investors overall remain as shareholders in a bank or firm for long periods of time in my sample. For this plot, I consider an exit once the investor stops reporting holding shares in a firm or bank for over a year. The plots shows that nearly 50 percent of investors remain as shareholders of the company over 10 years. The institutional investor survival rate is slightly higher for banks.

## 3.4 Common Ownership in Financial Returns and Corporate Decision-making

Throughout the model and the results, I will rely on the assumption that banks and firms are well aware of the distribution of shareholders at any given point of time. In addition, that their corporate strategies are attuned to maximizing shareholder revenue taking into account common owners. Particularly, when the bank lends to firms they consider the returns of their shareholders that also hold shares of the borrowing firm exactly by the proportion of total shareholders they represent. Or that common owners are at least able to transmit information asymmetry alleviating channels proportional to their ownership stakes in the firm and bank. There are fallbacks when the relation is not concrete between partial ownership in financial returns and corporate decision as discussed in O'Brien and Salop (2000). When there is complete common ownership — in my particular context when one institutional investor owns all the shares of the bank and firm — this relation is straightforward. As investors internalize all returns on the firm and bank side, they could be indifferent from which side it comes from as long as the joint bank and firm corporate decision-making maximizes their overall revenue.

When investors do not fully own the firm and bank, as in the scenarios I analyze, some shareholders will not fully reap the benefits from both firm and bank returns or act as conduits for information flow. This could lead to more bargaining over corporate control between sets of shareholders with different incentives. A higher financial interest through stock ownership could be associated with more corporate control. In other cases, different types of shares with voting rights might break down that relationship giving those with large financial interest no say in corporate decision-making they do not own any voting stock. There are also fiduciary obligations on the Board of Directors to maximize shareholders returns for all shareholders and not those only with majority stock. This could decrease the corporate control influence of major shareholders.

Measuring the exact difference between asset ownership and corporate control will be hard to measure empirically with the data used in this paper. Specially, the degree to which the difference influences the banks decision to internalize its partial common ownership structure by considering its common owners' access to firm returns or informational channel potential. Instead to provide insight to this issue, one of the common ownership measures I use — Firm Common $\text{Own}_{i(fbt)}$ — tacitly assumes common owners have control over the bank's corporate lending lending arm or that information flow about the firm is proportional to the firm shares held by common owners as long as some exist. These results can be interpreted as an upper-bound scenario if common owners have a large say in the bank's decision-making process. In future work, I plan to disentangle more precisely the difference between asset ownership and corporate control under partial common ownership between firms and banks.

# 4 Methodology

Motivated from the intuition derived from the model discussed in Section 2, I empirically test whether common ownership leads to lower interest rates and larger loan sizes with the following estimating equation:

$$Y_{i(f,b,t)} = \beta_0 + \beta_1 CommonOwnMeasure_{i(fbt)} + \beta_2' X_{i(fbt)} + \beta_3' X_i + \delta_b + \delta_t + \epsilon_{i(fbt)} \quad (3)$$

The outcome variable $Y_{i(f,b,t)}$ is either loan rate spread over LIBOR or in log loan amounts as reported in DealScan for loan $i$ between firm $f$ and bank $b$ at time originated $t$. The main coefficient of interest — $\beta_1$ — is on the variable $CommonOwnMeasure_{fbt}$. This variable will be one of the three common ownership measures at loan origination defined above: 1) Indicator if the firm and bank have one institutional investor in common 2) Firm-Bank Common Own$_{i(fbt)}$: product between the percentage of firm shares and percentage of bank shares held by institutional investors in common 3) Firm Common Own$_{i(fbt)}$: the percentage of firm shares held by institutional investors that also hold bank shares. $X_{i(fbt)}$ is a vector of firm time-varying and invariant variables to control for its performance that can also impact its loan terms such as as assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin $q$, firm state and industry fixed effects. The vector also includes time-varying bank performance controls such as bank assets and capitalization as measured by Tier 1 Capital, deposits over total assets and non-performing assets over total assets ratios. $X_i$ is a vector of controls from Dealscan that contains maturity, loan type, loan purpose and covenant presence. $\delta_b$ is a bank fixed effect included in all regressions. $\delta_t$ is the vector of time fixed-effects meant to control for any aggregate trends. Regressions are clustered at the bank and quarter level.

To track how firms perform after they obtain a loan with bank common ownership, I also estimate a linear probability model (LPM) where the dependent variable will be a firm outcome measure based on an indicator variable. To assess common ownership's effect on hampering financial distress, $Y_{it}$ is an indicator variable if the firm receives a credit rating downgrade from S&P. For firm real activity measures, I use two separate indicators if the firm increases its profitability and capital expenditures proportional to total assets. To analyze common ownership's effect on lowering firm distress, I also use as outcome variables indicators if the firm decreases its workforce by more than one percent or if they sell assets. All these outcomes are measured a year after the firm obtains a credit facility.

## 4.1 Research Design

To estimate a plausibly causal effect of common ownership on loan terms, I use variation in common ownership driven by index fund ownership of banks and firms. As used by Azar et al. (2016), these index funds are: iShares, Vanguard, SPDR, Invesco's PowerShares, and Fidelity's Spartan. The idea for this research design is as follows. Index funds' ownership changes are not driven by fund managers predicting temporary changes in firms' and banks' investment opportunities or investors' portfolio strategies that could lead to better loans terms or posterior firm and bank performance. As a result, endogeneity stemming from active fund managers' investment strategies that could be related to better loan terms should be less of a concern for the results I obtain using this strategy. Index funds increase their investment in companies when people increase their savings in index funds or based on predetermined rules on the aggregate value of their holdings which I argue is exogenous to firm and bank characteristics that might lead to lower loan rates and larger loans. As firm's and bank's have different degrees of index fund ownership, their respective growth leads to cross-firm variation in common ownership induced by such funds.

Formally, for the 2SLS approach I use the following estimating equations in the first- and second-stage:

$$CommonOwnMeasure_{i(fbt)} = \eta_0 + \eta_1 IndexFundCommonOwnMeasure_{i(fbt)} + \eta_2' X_{i(fbt)}$$
$$\eta_3' X_i + \delta_b + \delta_t + \xi_{i(fbt)} \tag{4}$$
$$Y_{i(f,b,t)} = \beta_0 + \beta_1 CommonOwnMeasure_{i(fbt)} + \beta_2' X_{i(fbt)} + \beta_3' X_i +$$
$$\delta_b + \delta_t + \varepsilon_{i(fbt)} \tag{5}$$

$CommonOwnMeasure_{i(fbt)}$ stands for either Firm-Bank Common $\text{Own}_{i(fbt)}$ or Firm Common $\text{Own}_{i(fbt)}$ as defined above. For the 2SLS estimation strategy, I will only use those two intensive measures of common ownership as the main explanatory variables in separate estimations. I cannot implement this strategy to the extensive measure as the top index funds holdings do not induce much variation in explaining firms and banks being connected at all by having these institutional investors as their only ones in common. For $IndexFundCommonOwnMeasure_{i(fbt)}$, I construct a common ownership measure using only the holdings data from main index funds to serve as instrumental variables. These are equivalent to Firm-Bank Common $\text{Own}_{i(fbt)}$ or Firm Common $\text{Own}_{i(fbt)}$ restricted to using shares held by index funds. Formally, I construct them as:

$$\text{Firm Index Common Own}_{i(fbt)} = \frac{\sum_n Shares_{i(nft)} * \mathbf{1}\{n \in Index_{i(bt)} \cap Index_{i(ft)}\}}{TotalShares_{i(ft)}}$$

$$\text{Bank Index Common Own}_{i(fbt)} = \frac{\sum_n Shares_{i(nbt)} * \mathbf{1}\{n \in Index_{i(bt)} \cap Index_{i(ft)}\}}{TotalShares_{i(bt)}}$$

$$\begin{aligned}&\text{Firm-Bank Index Common Own}_{i(fbt)} = \\ &\qquad \text{Firm Index Common Own}_{i(fbt)} \times \text{Bank Index Common Own}_{i(fbt)}\end{aligned}$$

These measures of index funds-based common ownership are by definition a subset of those constructed with all institutional investors. The only difference is that I replace $Investors_{i(bt)}$ and $Investors_{i(ft)}$ with $Index_{i(bt)}$ and $Index_{i(ft)}$, respectively, where the index funds are the five main ones listed above. The numerator for each measure now is summed across index fund holdings when the index fund holds the bank and firm concurrently instead of across all institutional investors.[12] In the 2SLS estimating equation, Firm-Bank Index Common $\text{Own}_{i(fbt)}$ and Firm Index Common $\text{Own}_{i(fbt)}$ will serve as the

[12]Blackrock, State Street, Invesco and Fidelity have other active management funds. For this measure, I only use holdings allocated to their index funds.

instruments for Firm-Bank Common $\text{Own}_{i(fbt)}$ and Firm Common $\text{Own}_{i(fbt)}$, respectively.

While the underlying reason for using the index fund induced variation as plausibly exogenous is the same as in Azar et al. (2016), I construct and apply it differently given the nature of my setting. In their setting, the main outcomes of interest are prices faced by consumers set by firms. They construct generalized and modified Herfindahl-Hirschman Indices of common ownership (GHHI and MHHI, respectively) to measure their impact on these prices charged by firms. These are motivated by O'Brien and Salop (2000) and Bresnahan and Salop (1986) and intend to capture market concentration when a set of horizontally competing firms in the market are partially owned by institutional investors that have shares in several of them concurrently. As their instrument for GHHI and MHHI, they use the sum of the firm market shares weighted by the portion of the firm owned by the five main index funds mentioned above.

In my setting, I analyze the common ownership always between two firms — the bank and borrowing firm — that have a vertical relation and I do not consider the market power each has in their respective market. I focus on how such common ownership impacts loan terms and not prices set by each firm faced by consumers downstream. My constructed common ownership measures intend to capture the share of the borrowing firm's cash flow rights held by shareholders relative to their concurrent stake in the bank. The instrument I use in my estimation — index fund common ownership — is by definition a fraction of the endogenous variable, overall common ownership, in contrast to how the index fund data is used in Azar et al. (2016).

# 5 Results

## 5.1 Baseline Estimates

In Panels A and B of Table 3, I present the reduced form effect of common ownership on loan rate spread and log loan size, respectively. I show the results from the baseline estimation Equation (3) using one of the three measures of common ownership in each column. In the first column, I use the extensive measure of common ownership that indicates if the firm and bank share at least one institutional investor at the time of loan origination. In the second column, I use the intensive measure of common ownership which is the product of the fraction of the firm and bank held by institutional investors that have shares in both concurrently. In the third and final column, I use the additional intensive measure of common ownership representing only the fraction of the firm owned by institutional investors that also own bank shares. For clarity in the tables, I show the estimates after including all the relevant control variables in the estimating equation and suppress the subscripts.

Across the three ways measured, common ownership is associated with lower rate spreads and larger loan sizes. When a firm and a bank have at least one institutional investor in common, there is an eight basis point decrease in the loan rate spread. This is about half the magnitude on loan rate spreads explained by the firm and bank being connected through executives as estimated in Engelberg et al. (2012).[13]

Using Firm-Bank Common $\text{Own}_{i(fbt)}$ as the measure of common ownership, there is almost a 42 basis point decline in loan rate spreads going from none to full common ownership. For easier interpretation in the intensive measures, I show the effect of common ownership on loan rate spreads and log loan size by increases in its standard deviation as well as the point estimate. A one standard deviation increase in Firm-Bank Common $\text{Own}_{i(fbt)}$ is associated with around a six basis point decrease in the loan rate spread. Meanwhile, a standard deviation increase in the firm common ownership percentage, Firm Common $\text{Own}_{i(fbt)}$, is associated with around a seven basis point decrease in the loan rate spread.

Regarding loan size, I find a positive relationship between common ownership and loan sizes. Loans are around two percentage points larger when a firm and a bank share at least one institutional investor in common. Using the intensive measures of common ownership, there is a about a one percentage point increase in the loan size when there is a one standard deviation increase using either intensive measure.

[13] In that study, they show that when one firm executive shares at least one school connection or third-party past professional connection with a bank executive in the syndicate leads to around a 17 basis point decrease in loan rates.

### 5.2 2SLS Estimates

I now present results instrumenting for overall common ownership percentage with index fund common ownership percentage to overcome potential biases arising from some strategic investing from institutional investors for separate reasons in banks and firms. Table 4 shows the estimation results for the first-stage, Equation (4), for both intensive common ownership measures. Given that index fund ownership is a subset of overall institutional investor ownership, the positive coefficients on the main index fund-based common ownership measures are expected and are each economically and statistically significant. Due to their construction as well, the index fund-based common ownership measures pass weak instruments tests with F-stats well above the commonly used threshold of ten. It is important to note that the effect of index induced common ownership on overall common ownership once all the controls are included is not necessarily one to one. This could be due to other institutional investors that follow the index fund trading strategies and their effect is absorbed by my instrument as well.

Panels A and B of Table 5 shows the 2SLS estimates using Equations 4 and 5 where the outcomes are loan rate spreads and log loan size, respectively. As index funds common ownership does not induce much variation on the extensive margin, I focus on the intensive measures when estimating the 2SLS equation. I include for comparison the results from the baseline OLS estimates next to its equivalent 2SLS estimates.

In Panel A of Table 5, I show in the first two columns the estimates using the common ownership intensive measure — Firm-Bank Common $\text{Own}_{i(fbt)}$ — derived from the product of the firm and bank shares percentage held by institutional investors that hold shares in the bank and firm at the same time when the loan is originated. Using the variation induced by index funds, a one standard deviation increase in Firm-Bank Common $\text{Own}_{i(fbt)}$ leads to around a five basis point decrease in the loan rate spread as denoted in Column (2). As noted before, such change in Firm-Bank Common $\text{Own}_{i(fbt)}$ could be driven by either changes on the firm or bank percentage common ownership holdings by institutional investors. The measure is agnostic to which side is the most relevant and instead I focus on that there is more overall firm and bank common ownership no matter the specific source. In Columns

(3) and (4) I show the OLS and 2SLS estimates using the common ownership measure of the percent of firm shares owned by investors that hold the firm and bank concurrently defined as Firm Common Own$_{i(fbt)}$. In this case, a one standard deviation increase in the common ownership measure leads to a decrease of just below five basis points in the loan spread.

In both sets of estimations using intensive measures, it is worth noting that the magnitude of the effect of common ownership on loan rate spreads is reduced using 2SLS estimates. This is expected since the OLS estimates are potentially downward biased by picking up unobserved time-varying firm and bank performance measures. More specifically, I attempt to control with my 2SLS strategy for institutional investors increasing their shareholdings of the firm and bank because of better performance for separate reasons. This would lead to common ownership between them and to be endogenously related to lower loan rate spreads.

Regarding loan size, Panel B of Table 5 shows the estimates from the 2SLS estimation where loan amount in logs is the outcome variable. The relationship between loan amount and common ownership percentages remains positive and statistically significant throughout OLS and 2SLS specifications. Using the 2SLS coefficients, a one standard deviation increase in common ownership is associated with an increase of around two percent in loan size using either of the common ownership measures on the intensive margin. Such effects are slightly larger than the OLS estimates.

For comparison, the effects I estimate are smaller but still account for a comparable fraction of the effect on loan rate spreads and loan sizes estimated in previous studies that create intensive measures of connections between firm and bank executives and the firm executive overall relationship with a bank. In Engelberg et al. (2012), in the most stringent specification, they find that increasing the number of firm and bank connections by 1.5 (the average in their sample) leads to about an eight basis point decrease in loan rate spreads and about a five percentage point increase in loan sizes. My estimated effects of increasing common ownership on loan rate spreads and size are smaller but over half in magnitude compared to their findings. In Karolyi (Forthcoming), the author shows that a one standard deviation increase in his firm executive and bank relationship measure[14] is associated with a

[14] This measure is constructed taking into account the duration, frequency, recentness and size of loan deals between firm executives and bank pairs.

decrease of around 18 basis points in loan rate spreads and an increase of 11 percentage points in loan amounts. Compared to his estimates, mine are slightly below half in magnitude for loan rate spreads and above a third for loan size.

## 5.3 Positive Common Ownership

As noted previously, a large fraction — 40 percent — of my loan sample has no common ownership between the firm and the bank. In this section, I restrict the sample to observations with some positive common ownership according to my constructed measures. This is done to ensure that previous results are not driven completely by functional form by comparing firms and banks that have no common ownership to those that have some common ownership. In Panels A and B of Table 6, I report OLS and 2SLS results as in the previous section but only using loans where banks and firms have positive common ownership.

When restricted to the positive common ownership sample, the inverse relationship between interest rate spreads and common ownership still holds and increases in magnitude as shown in Panel A of Table 6. A one standard deviation increase in the product of firm and bank common ownership leads to a decrease of around 18 basis points in loan rate spreads. This is about three times larger than estimates when including loan observations where there is no common ownership. Similarly, a standard deviation increase in the firm common ownership percentage leads to a decrease of around 13 basis points in loan rate spreads.

In Panel B of Table 6, I show the estimates from the OLS and 2SLS regressions using log loan size as the outcome and restricting the sample as before where there is positive common ownership. A standard deviation increase in the product of firm and bank common ownership leads to larger loan size by about ten percentage points. Similarly, a standard deviation increase in firm common ownership leads to increases in loan size by about five percentage points. Overall, results in this section suggest that common ownership still impacts loan terms even when restricting the comparison between firms and banks with some degree of common ownership. In addition, the effects on loan rate spreads and size restricted to this sample are larger than estimates using the full sample and similar in magnitude to the effects of firm executive personal relationship with the bank as constructed in prior literature and described at the end of the previous section.

## 5.4 Financial Distress

In this section I examine firm outcomes after it obtains a loan from a bank potentially under a common ownership structure. Results in the previous sections show that common ownership leads to a lower loan rate spread and a larger loan size. I now analyze if such loan terms are given to firms with subsequent worse outcomes. In such case, these could be considered lenient deals to firms partially owned by their shareholders at the expense of other bank shareholders that do not have claims to the firm's cash flow. On the other hand, if firms do not necessarily underperform after it could suggest that the better financial flexibility is due to the bank having a channel to overcome adverse selection problems, to monitor or access firm returns through common ownership.

Unfortunately, the loan data source does not track loan performance over time to observe if default rates differ depending on the common ownership between the firm and bank. I instead examine outcomes at the firm level to analyze posterior financial stability performance. In this regard, an important measure that shareholders should care about is avoiding financial distress which is broadly related to firm avoiding defaulting on loans. Shareholders in the firm and bank would seek that a loan goes to a firm that avoids such situation if they are not going to underperforming firms as sweetheart deals.

In Panel A of Table 7, I analyze the effect of loan common ownership on firms avoiding financial distress through a LPM regression where the outcome is an indicator variables if the firm received a credit downgrade in the year after the firm obtained a loan (e.g. BBB to BB or below). The results suggest that firms with a larger common ownership with the bank at the time of loan origination are less likely to go through financial distress the year after. An increase of one standard deviation in either common ownership percentage is associated with about a two percent decrease in the probability that the firm will receive a S&P credit downgrade in the year after it obtains a loan. This decrease accounts for about a quarter to a half lower probability in receiving a S&P credit downgrade compared to the observed mean in the sample (seven percent).

## 5.5 Real Activity Outcomes

While firms obtaining loans from banks when they share common shareholders appear to be less likely to receive a credit rating downgrade, I also analyze if firm real activity measures worsen after obtaining such loan. I construct these real activity measures from Compustat variables that, albeit noisy, can offer insight into firms' overall performance. I create indicator variables related to profitability, capital expenditures, asset sales and employment. One set of indicator variables intend to measure improvements related to balance sheet items and investment. The first is if the firm increases its profitability and the second is if it increases its capital expenditures in the year after it obtained a loan. Both profitability and capital expenditures are relative to total assets. Then to measure if firms go through difficulties affecting its workforce or assets, I create indicator variables if the firm is forced to layoff over one percent of its workforce or if it needs to sell assets in the year after it obtains a loan.

In Panels B through E of Table 7 show the results estimating the 2SLS regressions as described in Equations (4) and (5). The outcome variable is now one of the four firm real activity indicator variables. These are LPM estimates as the outcome variable is an indicator in all cases.

I find that firm performance does not appear to worsen across the real outcome measures I construct after it obtains a loan related to how much common ownership it has with the bank. As shown in Panel B of Table 7, my intensive measures of common ownership appear to lead a higher chance of increasing profitability in the year after obtaining a loan when using 2SLS estimates but the effect is not statistically significant. The pattern is similar with capital expenditures. Regarding employment, an increase in one standard deviation in common ownership between the firm and bank leads to around a four to seven percentage point increase in the likelihood that a firm will have employment layoffs of more than one percent compared to the previous year. This is shown in Panel D of Table 7 and the effect is statistically significant for 2SLS estimates using either one of the intensive measures of common ownership. Using my fourth measure of real activity performance, I find that firms are about three percentage points less likely to have to sell assets the year after it obtains a loan when there is a standard deviation increase in common ownership using either intensive measure. This effect is statistically significant at the ten percent level when using the firm common ownership measure.

Overall, there are no observed large signs of underperformance in the year after obtaining a loan. While not statistically significant, directionally the coefficients estimated point towards firms increasing their profitability, capital expenditures and lowering their need to sell assets. On the other hand, there is a statistically significant increase in the likelihood they will undergo layoffs but also a decrease in the likelihood they will undergo financial distress by receiving a credit downgrade by S&P. Most relevant to my analysis in these sections, not observing overall deteriorating firm performance indicates at the very least that the bank's favorable loan terms were not lenient or meant as sweetheart deals to firms that ex-post perform worse solely because they were under a partial common ownership structure.

# 6 Potential Mechanisms

In this section I analyze how common ownership can lead to better loan terms that are not necessarily sweetheart deals based on heterogeneity in firm and loan syndicate characteristics. Such exercise aims to shed light on mechanisms at work that enable common ownership to lower loan rate spreads and increase loan sizes.

## 6.1 Firm Size

A potential reason I might observe the inverse (positive) relationship between loan rate spreads (loan size) and common ownership is that larger firms are more likely to have institutional investors and index funds as shareholders. As larger firms are more established and older they are associated with having larger loans and with lower rate spreads. Such effect could hold through unobserved variables that are not being picked up by my set of observable variables used as controls throughout the regressions. On the other hand, smaller firms have potentially more volatile and uncertain growth prospects and common ownership may act as a channel to alleviate information asymmetry concerns or to ensure some of the bank shareholders will have access to the firms cash flow even if not explicit in the loan contract. Common ownership could then improve financial flexibility on loan terms for smaller firms.

To distinguish how the effect of common ownership differs by firm size, I create an indicator for the firm being small defined as the firm being below the asset size median by year for firms in the analysis sample. I also interact this variable with the intensive common ownership measures defined above — Firm-Bank Common $\text{Own}_{i(fbt)}$ and Firm Common $\text{Own}_{i(fbt)}$ — to measure the additional effect common ownership has for small firms. I add the small firm indicator and its interaction with my common ownership measures to the 2SLS estimation described by Equations (4) and (5). As I now have an additional endogenous variable, I construct the equivalent interaction between the small firm indicator and my index-based common ownership measures that serve as my instruments. As in previous tables, I show the OLS estimate next to its 2SLS estimate using the index fund common ownership as an instrument for overall common ownership.

Table 8 shows the regression results where loan rate spreads is the outcome variable. I find that on average small firms obtain a higher interest rate consistent with their growth prospect being harder to assess. Depending on the specification, such increase is around ten basis points. However, the interest rate spread is reduced once common ownership is taken into account. A one standard increase in common ownership percentage decreases the loan rate spread by around 11 basis points for small firms when using the common ownership definition using the firm and bank side percentages. The same effect is around an eight basis point decrease when using the common ownership measure using only the percentage of firm shares held by institutional investors in common with the bank. When combined with the baseline common ownership effect, loan rates decrease overall for small firms when there is a one standard deviation increase in common ownership. Table 9 shows the regression results where log loan size is the outcome variable. In this case, the additional effect of the small firm indicator interaction with common ownership measures is smaller than the baseline effect for large firms and statistically insignificant but still positive. A caveat to both sets of results is that the 2SLS estimates appear to be underpowered to have statistical significance as I have two endogenous variables with two instruments but the direction is consistent.

## 6.2 Credit Rating

Beyond firm size, another measure of uncertainty in assessing a firm's creditworthiness is if it has a public credit rating by S&P at the time of loan origination. Credit ratings are meant to show the firm's repayment capacity and access to public debt markets. Common ownership by institutional shareholders may help alleviate the uncertainty in creditworthiness assessment as some shareholders will obtain returns from the firm regardless of loan performance or can act as conduits to relay knowledge alleviating information asymmetries between the firm and bank. Such mechanisms can help a firm access financing when their creditworthiness signal is not verified by a third party such as S&P.

Table 10 shows the effect of common ownership by credit rating status on loan rate spreads. I add an indicator if a firm does not have a S&P credit rating at the time of loan origination defined as No Rating. To analyze its effect with common ownership, I follow the same procedure described in the previous section only replacing the small firm indicator with the one indicating no rating.

I find that on average firms with no rating have a significantly higher loan rate by around 70 basis points. This is consistent with their creditworthiness being harder to evaluate and priced into the loan rate. However, common ownership percentages significantly lower the rate spread they face. A one standard deviation increase in common ownership percentage leads to an additional decrease of around 15 basis points in loan rate spreads for firms with no credit rating depending on the common ownership measure and estimation strategy used. The baseline common ownership effect for firms with a credit rating is smaller and closer to a three basis point decrease. Table 11 shows the results from the same specification with log loan size as the outcome variable. Similar to the results by firm size, the additional effect of the unrated firm indicator interaction with common ownership measures on loan size is smaller in most specifications than the baseline effect for large firms and statistically insignificant yet remains positive.

## 6.3 Bank Participants in the Syndicated Loan Market

Up until now I have focused on analyzing the common ownership between the firm and the lead bank in the loan syndicate. This was done under the idea that the common ownership structure with the lead bank is the most relevant as the lead bank is the one in charge of the originating and monitoring process. If other banks are aware of the inverse relationship between a lead bank's common ownership with the firm and interest rate charged, they could shy away from being participants in the syndicated loan with such lead bank as it would lower their profits. On the other hand, bank participants could benefit from the lead bank having common ownership with the firm thanks to alleviating information asymmetries and not being simply a sweetheart deal even if it does lead to a lower loan rate and potentially profits.

To test how common ownership impacts the composition of the loan syndicate, I carry out two analysis. First, I create an indicator variable for the bank acting as the lead arranger. I then pool all the bank participants in the syndicated loan and their respective common ownership measures with the firm to estimate a LPM where the outcome is an indicator for the lead arranger bank. This intends to measure the effect common ownership has on the probability of a bank being the lead arranger. A positive relationship would suggest that banks obtain a lead arranger status in the syndicated facility at least partially die to the benefits they bring with their common ownership with the firm even if it does lead to a lower interest rate. For the purpose of this analysis, I also use a the number of banks in the syndicated loan — a control variable in previous regressions — as an outcome to assess if more banks join the deal as participants when the lead bank arranger has more common ownership with the bank. In this estimation I use the same 2SLS set-up as described by Equations (4) and (5). If more banks join as participants when there is a higher common ownership with the lead bank, this suggests that they also find a benefit from the lead arranger having a such common ownership structure with the firm even at the expense of lower interest rate.

I find that there is a small but positive association between a bank's common ownership with the firm and the probability it is selected as the lead arranger in the deal. Table 12 reports the regression estimates when the outcome variable is an indicator for the bank being the lead arranger and the main explanatory variables are the common ownership measures described above across all banks participating in the syndicated loan. A standard deviation increase in either common ownership appears to be associated with an increase in one percentage point in the probability that the bank is the lead arranger in the deal albeit I do lose precision with the 2SLS estimates.

In Table 13, I find that the higher the common ownership between the lead arranger bank in the syndicated loan deal leads to a higher number of bank participants in the deal. This suggests that more banks join the syndicate in this scenario as they benefit indirectly from the lead arranger bank's common ownership with the firm. For the 2SLS estimates, a one standard deviation increase in either measure of common ownership leads to an increase by about half a bank in the total number of bank participants in the deal. This effect is about a tenth of an increase from the overall mean observed of banks (5.37) in syndicated loans.

# 7 Discussion

I have shown that under a common ownership structure firms obtain better loan terms from banks and these are not simply sweetheart deals. Among potential mechanisms at work are common owners alleviating information asymmetries and banks internalizing firm returns through the common owners. This motivates an analysis if the partial vertical integration of firm and bank can be beneficial for both companies and society at large. Raskovich (2008) discusses more in detail the potential benefits and pitfalls of a bank and firm completely vertically integrating. I put in context my results motivated from such discussion.

Raskovich (2008) describes that among the benefits from integrating banks and firms are: 1) eliminating double-marginalization when the bank and firm have market power in their respective markets 2) reducing transaction costs 3) lowering monitoring costs. As described above, these could potentially all be at work in my context. He notes that vertically integrated firms and banks might lead to reduced transaction costs by having firms benefiting from lower payment processing fees usually charged by banks when separate to the firm. This could also be reduced on the consumer side through firms and banks offering one-stop shop financial and retail services. Closer to my setting, banks through full vertical integration gain more information on the firm performance by being its sole owner and observing continuously firm inflows and outflows.[15] In addition, banks might have a potentially stronger incentive to monitor and a lower monitoring cost under full vertical integration. Banks will be in charge of all the firm's distress costs when the firm defaults on a loan and not just on the loan itself making the incentive to monitor stronger.

While Raskovich (2008) focuses on the potential benefits of fully vertically integrating firms and banks, these factors could also be relevant under partial common ownership through institutional investors as in my setting. Common owners can act as conduits of better information from the firm to the bank to the degree they are known by bank management. Given the large stakes these institutional investors have in both firms and banks, I believe this is a reasonable assumption. Regarding reducing transaction costs, these could be interpreted as the effect I find where banks offer better loans terms to the firm that becomes an internal transaction between partially commonly owned enterprises. Especially to the degree that banks internalize the returns that their shareholders in common with the firm will obtain from the firm's cash flow as well. Concerning overcoming double-marginalization, this paper does little to shed light on its occurrence as I do not analyze the market power that firms and banks have in their respective markets. I do find lower prices and higher quantity on the input the bank or upstream firm offers to the borrowing or downstream firm in the form of a loan as predicted when firms vertically integrate. However, I do not examine if this has an effect on prices and quantity offered by firms to the end consumer to test if double-marginalization is hampered through partial common ownership. This is also a question I aim to address in future research in this partial common ownership setting not only among firms and banks but also between other firms that have supplier and distributor or producer type of relationships.

Three major concerns do arise from firms and banks partially vertically integrating: 1) competition to be foreclosed 2) increased cost in regulation 3) weakened financial system stability. As described by my motivating model, a bank under partial common ownership

[15] In a similar setting to mine, see Ivashina and Sun (2011) for an analysis on the information flow from a bank being loan provider for the firm to its equity position on the firm.

with the firm has the incentive to reduce interest rates for a loan to the firm more than a bank that has no or less common ownership with the firm. The evidence I show suggests firms obtain better loan terms from a bank when it shares a common ownership structure with the bank. But given the syndicated loan structure and bank participation it appears such pitfall is not a major concern to completely shut down bank competition. The second and third concerns are interrelated and beyond the scope of this paper but are worth discussing broadly. At a micro-level, it appears that firms obtain better loan terms that helps them to perform marginally better after obtaining it or at the very least they do not underperform afterwards. However, a more integrated firm and banking industry through common ownership might make it more difficult for regulators to assess the overall risk in the financial system. Analyzing the trade-off between potential efficiency gains from partial common ownership driven through institutional investors and the increase in financial systemic risk is crucial to determine overall benefits to society coming from the observed increase in partially vertically integrated firm and banks. This is an area of research I hope to contribute to in the future.

# 8 Conclusion

The ever-growing presence of institutional investors in financial markets has led to an increase in partial common ownership between firms and banks that have loan relationships. Common owners have claims to the returns on the interest rate banks charge as well as returns from the firm's project and they can also provide a channel to overcome information asymmetries. On the other hand, this relationship could also lead to lenient loans to the firm carrying favor to the common owners at the expense of shareholders not in common with the firm.

This research shows that common ownership between banks and firms matters in the context of the syndicated corporate loan market. Common ownership between the lead arranger bank and the firm elicits lower interest rates and larger loans. To assess the effect of common ownership, I construct measures on the extensive and intensive margin based on the fraction of the firm and bank held by shareholders in common at the time of a loan origination. I use plausibly exogenous variation from index fund-induced common ownership to measure its effect orthogonal to strategic investment that could be associated with better loan terms. A one standard deviation increase in my intensive measures of common ownership leads to decrease of around five basis points in loan rate spreads and an increase by three percentage points in loan sizes. These loans do not appear to be sweetheart deals as firms do not underperform and are less likely to receive a credit downgrade in the year after obtaining the loan.

I find suggestive evidence that common ownership alleviates information asymmetries as it particularly improves loan terms for smaller and unrated firms that could have more difficulties signaling creditworthiness. In addition, there is a positive association between bank common ownership with the firm and the bank being the lead arranger in the syndicated loan. Loans where the lead arranger has a higher common ownership with the firm are also more likely to have more banks participants. These latter two effects occur even if such loans are associated with lower loan rates and hence profits to banks participants. They suggest bank participants find value from the the lead bank having a common ownership structure with the firm that could come from reducing information asymmetries.

These findings provide new insights on the impacts that the growth of institutional investors has on the loan market by expanding common ownership. Prior literature has found that institutional investors might hinder price discovery when they have passive strategies or hinder competition when they partially own multiple firms horizontally competing in a market. In my setting focusing on a vertical relationship, firms can obtain better loan terms from banks with a common ownership structure and not at the expense of other bank shareholders or banks participating in the syndicated loan. Understanding if such efficiency gains are prevalent across other firm vertical relationships when there is common ownership through institutional investors is a promising area for future research. More broadly, incorporating these effects of institutional investors when they own firms with vertical relationships to their impact across other markets can provide guidance to policymakers and help establish their overall benefit to the finance industry and society.

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Figure 1: **Relationship between Common Ownership and Interest Rates**. This graph shows the Interest Rate under two scenarios fixing other parameters in the model: no common ownership and with common ownership. $\theta\gamma$ is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank concurrently.

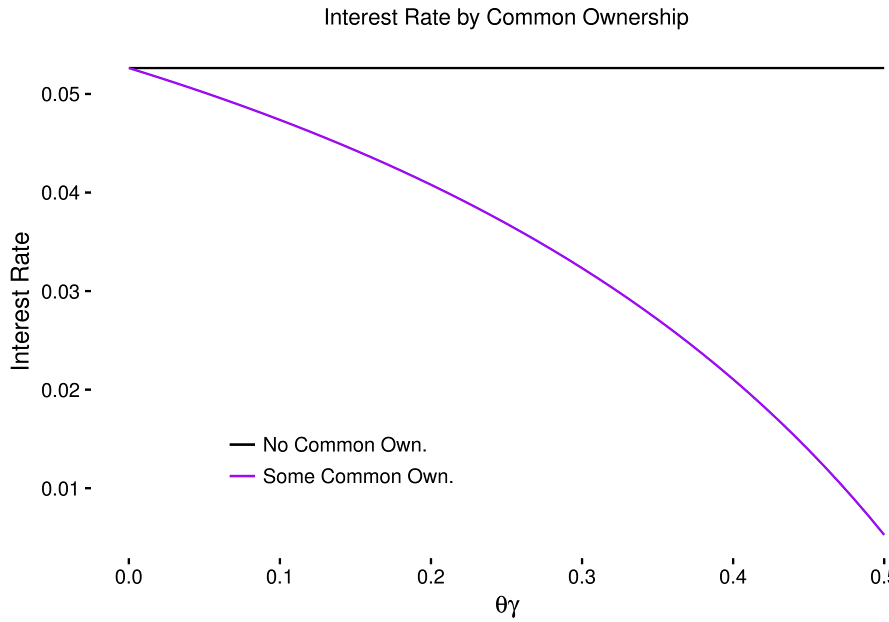


Figure 2: **Market Value of and Overall Percent of Shares held by Insitutional Investors**. This figure shows on the left axis the market value of shares held by institutional investors of firms that appear at any point in Dealscan. On the right axis it shows the average fraction of a public firm owned by institutional investors.

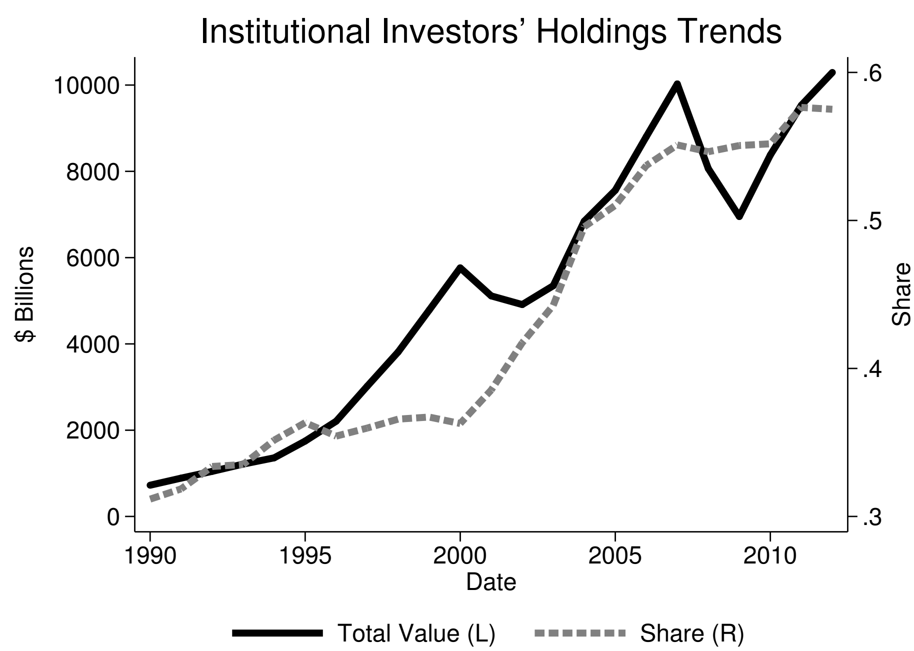

Figure 3: **Heatmap: Percent Common Ownership between Firm and Banks**. This figure shows the common ownership percentage between a sample of firms and two banks as of 2004Q1. $\theta\gamma$ is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank concurrently. The darker shade in the heatmap denotes higher levels of common ownership.

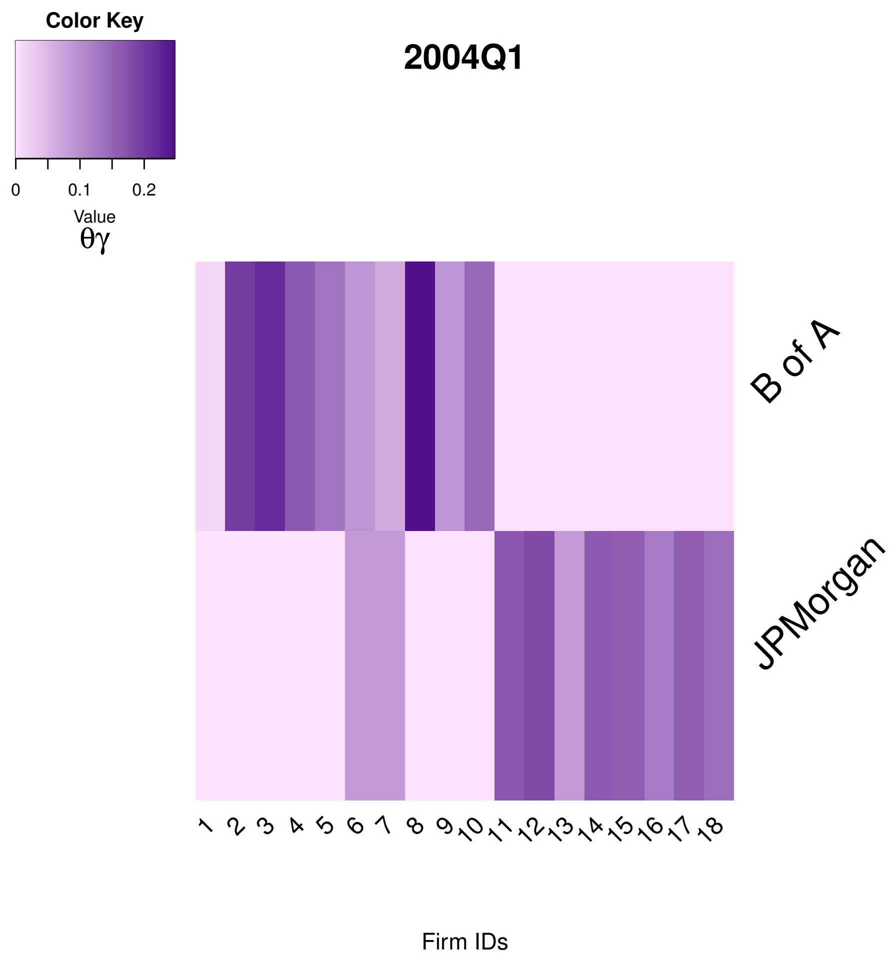

Figure 4: **Heatmap: Percent Common Ownership between Firm and Banks**. This figure shows the common ownership percentage between a sample of firms and two banks as of 2011Q1. $\theta\gamma$ is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank concurrently. The darker shade in the heatmap denotes higher levels of common ownership.

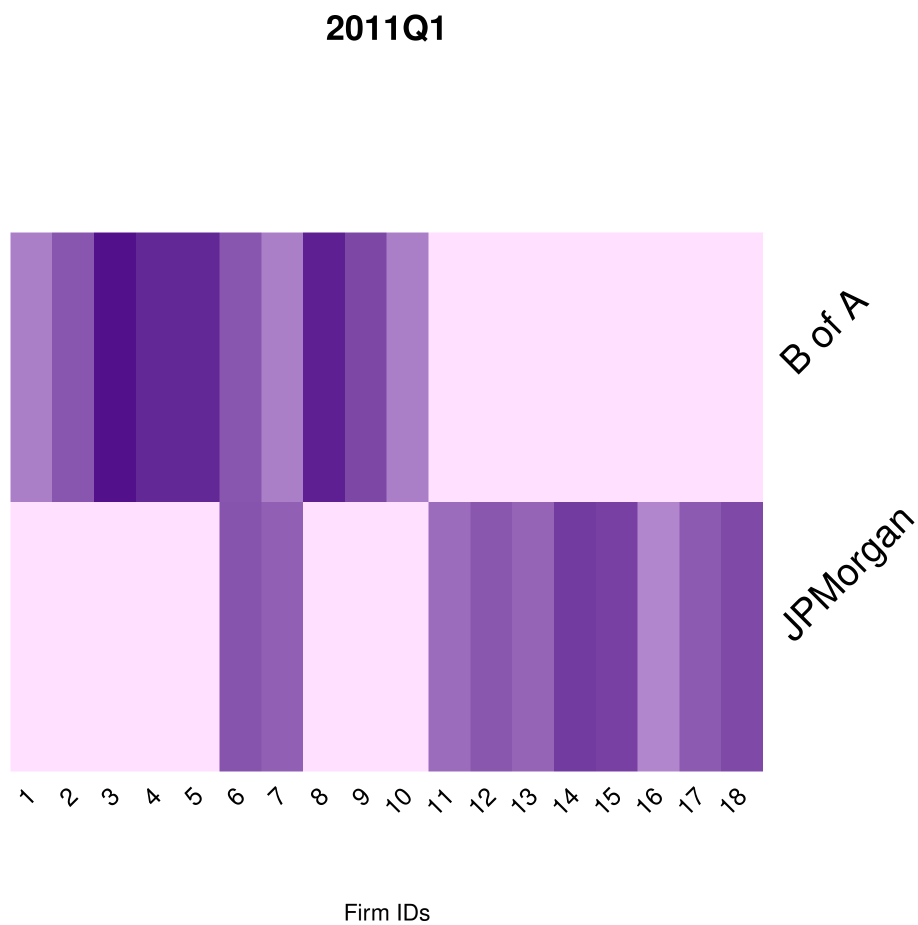

Figure 5: **Heatmap: Difference Percent Common Ownership between Firm and Banks**. This figure shows the difference in common ownership percentage between 2004Q1 and 2011Q1 for a sample of firms and two banks. Red shades denote decreases while blue shades denote increases in common ownership between the two periods.

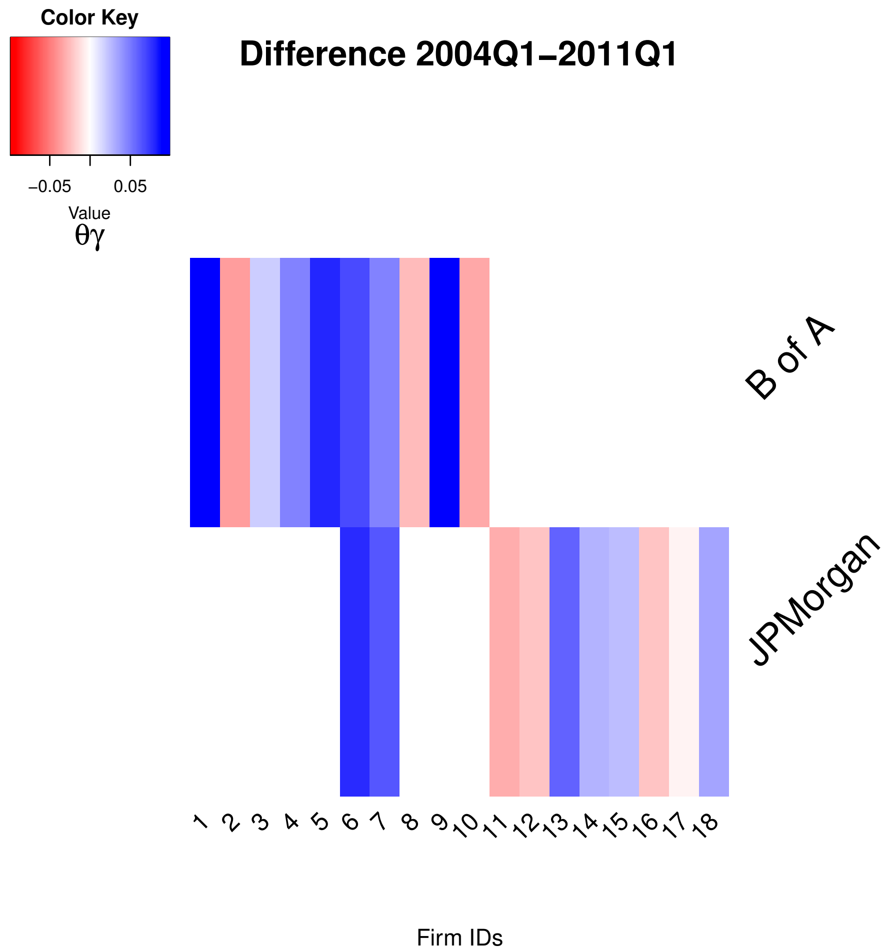

Figure 6: **Average Firm and Bank Common Ownership**. This figure plots the average share held of the firm by investors that also own bank shares (empirical $\theta$) and the average share held of the bank by investors that also own firm shares (empirical $\gamma$). Data restricted to firm and bank combinations observed at any point in the Dealscan sample used.

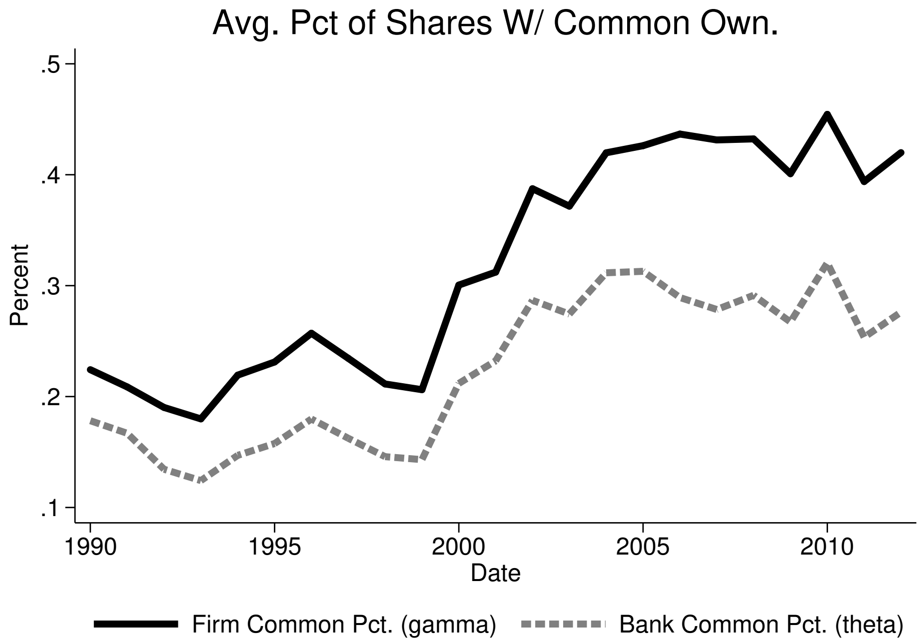

Figure 7: **Percent of Continuing Investors as Common Shareholders**. This figure shows the percent of investors that are firm and bank common shareholders that also were common shareholders in the previous year. Plot shown separately for percent of continuing investors in firms and in banks. Data restricted to firm and bank combinations observed at any point in the Dealscan sample used.

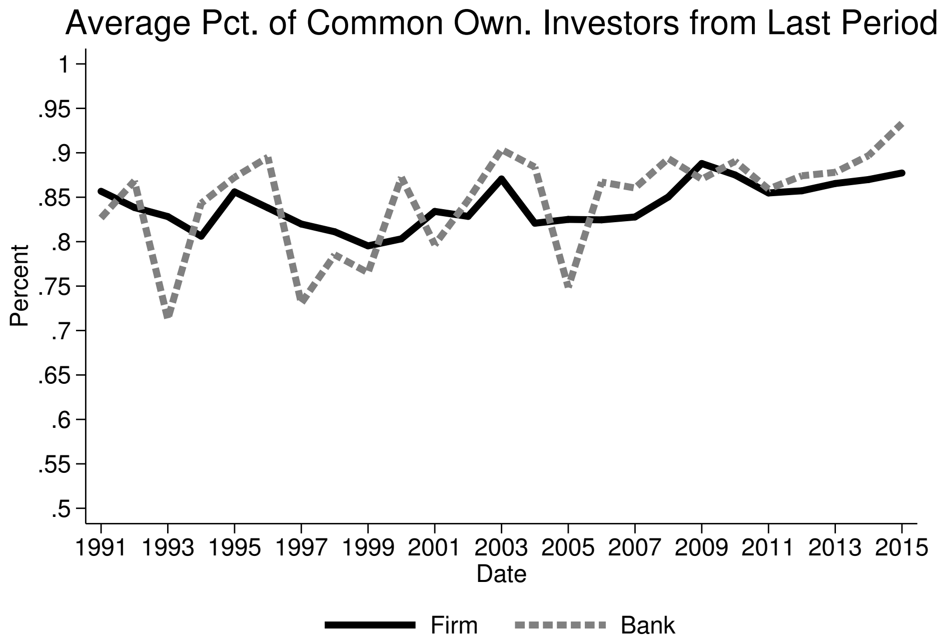

Figure 8: **Percent of Shares Held by Continuing Investors as Common Shareholders**. This figure shows the percent of shares held by investors that are firm and bank common shareholders that also were common shareholders in the previous year. Plot shown separately for percent of shares held by continuing investors in firms and in banks. Data restricted to firm and bank combinations observed at any point in the Dealscan sample used.

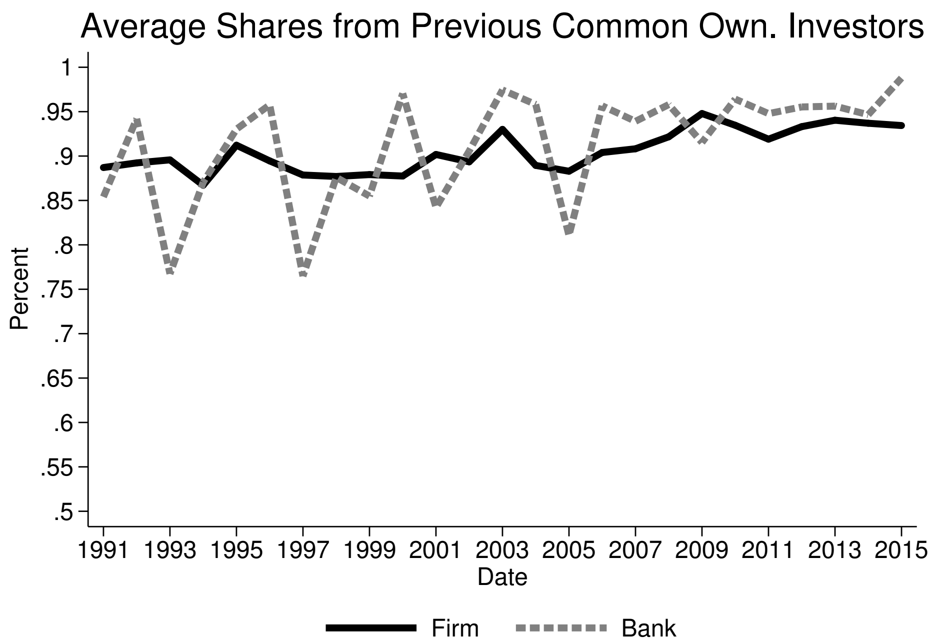

Figure 9: **Average Firm and Bank Common Ownership**. This figure plots a hazard curve for periods an institutional investor remains a shareholder until exiting by not holding the firm for over one year. Data restricted to firms and banks observed at any point in the Dealscan sample used.

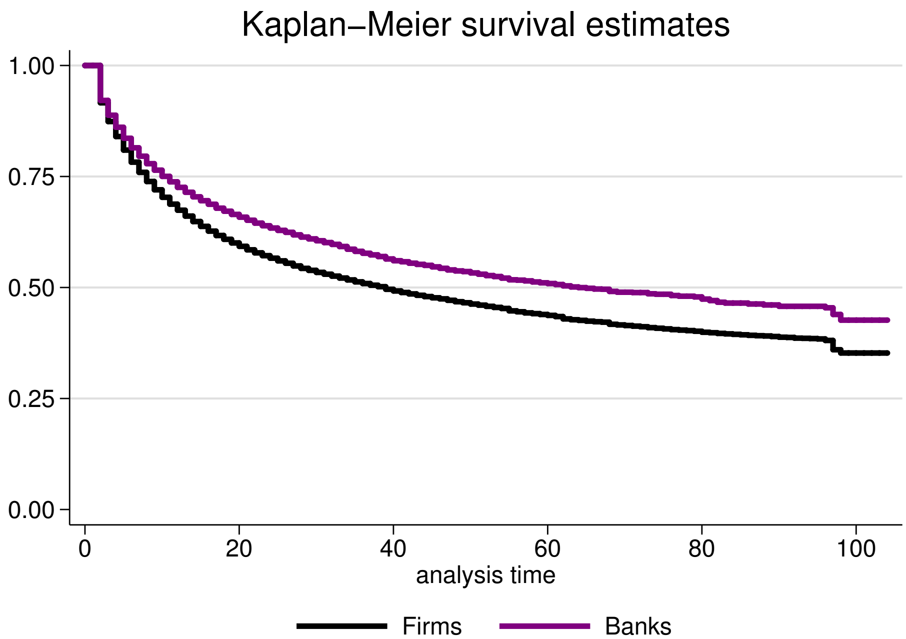

Figure 10: **Binscatter: Average Residualized Interest Rate and Common Ownership Percentage**. This figure shows the average interest rate spread residual by increasing bins of common ownership percentage between firms and banks. Common ownership percentage is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination (empirical $\theta\gamma$). Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose.

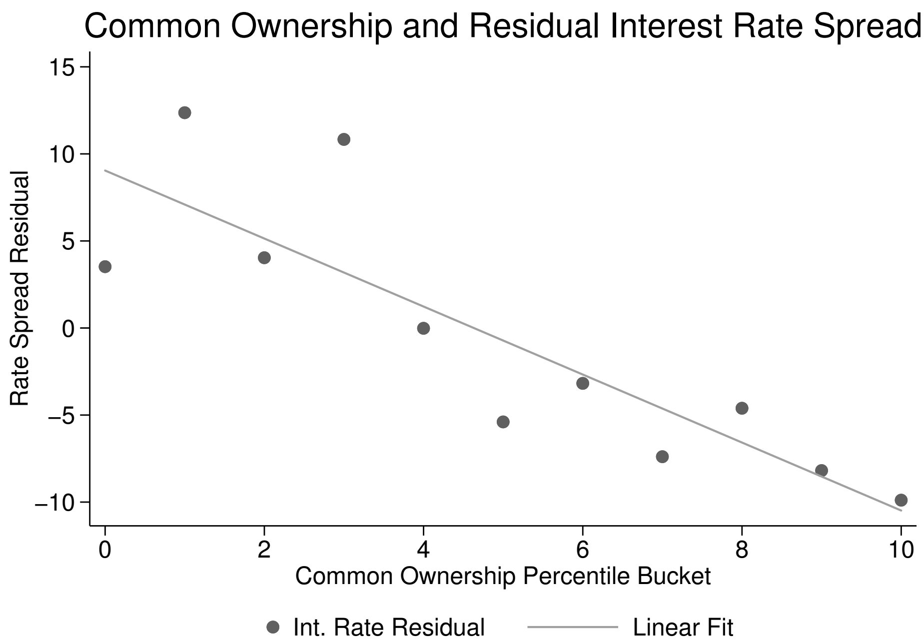

Table 1: **Summary Statistics**. This table reports summary statistics for the sample of loans merged with borrower, bank characteristics and institutional investor ownership. The sample contains new loan originations matched with lead arrangers with characteristics observed at the time of origination.

| | Mean | SD | P25 | P75 |
|---|---|---|---|---|
| *Loan Variables* | | | | |
| Credit Spread (bps) | 191.16 | 131.22 | 90.00 | 255.00 |
| Maturity (yrs) | 3.74 | 1.88 | 2.08 | 5.00 |
| Facility Amount ($MM) | 337.88 | 666.37 | 42.74 | 351.73 |
| Amount/Firm Assets | 0.18 | 0.16 | 0.07 | 0.25 |
| Revolving | 0.11 | 0.31 | 0.00 | 0.00 |
| Working Capital | 0.21 | 0.41 | 0.00 | 0.00 |
| *Firm Variables* | | | | |
| Assets ($B) | 4.56 | 11.69 | 0.33 | 3.57 |
| Cash | 0.20 | 0.20 | 0.04 | 0.30 |
| Tangibility | 2.19 | 3.91 | 0.27 | 2.18 |
| Profitability | 0.14 | 0.23 | 0.05 | 0.18 |
| Tobin's Q | 1.36 | 1.12 | 0.77 | 1.61 |
| Relationship Length (qtrs) | 13.34 | 16.20 | 0.00 | 21.00 |
| Has Above A- S&P Rating | 0.10 | 0.30 | 0.00 | 0.00 |
| Issued Public Debt or Equity | 0.14 | 0.35 | 0.00 | 0.00 |
| Credit Downgrade | 0.07 | 0.25 | 0.00 | 0.00 |
| Increases Profitability | 0.49 | 0.50 | 0.00 | 1.00 |
| Increases CapEx | 0.47 | 0.50 | 0.00 | 1.00 |
| Experiences Layoffs | 0.42 | 0.49 | 0.00 | 1.00 |
| Sells Assets | 0.30 | 0.46 | 0.00 | 1.00 |
| *Bank Variables* | | | | |
| Assets ($B) | 347.88 | 575.00 | 48.75 | 343.34 |
| Tier 1 Capital | 9.25 | 1.97 | 7.82 | 10.36 |
| Non-Performing/Total Assets (%) | 0.01 | 0.01 | 0.00 | 0.01 |
| Deposits/Total Assets (%) | 0.63 | 0.13 | 0.59 | 0.70 |
| *Common Ownership Variables* | | | | |
| Indicator Common Ownership | 0.60 | 0.49 | 0.00 | 1.00 |
| % Firm Common Ownership | 0.28 | 0.31 | 0.00 | 0.56 |
| % Firm-Bank Common Ownership | 0.11 | 0.15 | 0.00 | 0.22 |
| N | 15467 | | | |

Table 2: **Common Ownership: Example**. This table reports the fraction of shares held by the top ten shareholders for Wells Fargo and Petsmart in 2012Q1. In bold are the shareholders among the top ten that appear in common between the firm and bank when they established a loan relationship.

**WELLS FARGO**

| Institutional Investor | Fraction |
|---|---|
| BERKSHIRE HATHAWAY INC. | .07 |
| **VANGUARD GROUP, INC.** | .04 |
| **FIDELITY MGMT & RESEARCH CO** | .04 |
| **STATE STR CORPORATION** | .04 |
| **BLACKROCK INC** | .04 |
| CAPITAL WORLD INVESTORS | .03 |
| **WELLINGTON MANAGEMENT CO, LLP** | .03 |
| DODGE & COX | .02 |
| DAVIS SELECTED ADVISERS, L.P. | .02 |
| NORTHERN TRUST CORP | .01 |

**PETSMART**

| Institutional Investor | Fraction |
|---|---|
| LONGVIEW ASSET MGMT, L.L.C. | .06 |
| **VANGUARD GROUP, INC.** | .05 |
| **BLACKROCK INC** | .05 |
| **FIDELITY MGMT & RESEARCH CO** | .04 |
| CI FUND MANAGEMENT INC | .04 |
| **STATE STR CORPORATION** | .03 |
| **WELLINGTON MANAGEMENT CO, LLP** | .03 |
| FIRST PACIFIC ADVISORS, LLC | .02 |
| FIRST TRUST ADVR L.P. | .02 |
| AMERICAN CENT INVT MGMT, INC. | .02 |

Table 3: **Regression Analysis of Common Ownership: Loan Spreads and Loan Size**. This table reports regressions estimates of interest rate spreads and log loan size on common ownership between bank and firm as well as bank, firm and loan characteristics. Connected is defined as an indicator variable if there exists at least one institutional investor the owns shares of the firm and bank at the time of loan origination. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1) | (2) | (3) |
|---|---|---|---|
| Panel A: Rate Spread | | | |
| Connected | -8.24* | | |
| | (4.18) | | |
| Firm-Bank Common Own. | | -41.58*** | |
| | | (6.88) | |
| Firm Common Own. | | | -22.86*** |
| | | | (4.28) |
| $R^2$ | 0.60 | 0.60 | 0.60 |
| SD Effect | | -6.26 | -7.01 |
| Panel B: Log Loan Size | | | |
| Connected | 0.02** | | |
| | (0.01) | | |
| Firm-Bank Common Own | | 0.04** | |
| | | (0.02) | |
| Firm Common Own | | | 0.02* |
| | | | (0.01) |
| $R^2$ | 0.89 | 0.89 | 0.89 |
| SD Effect | | 0.01 | 0.01 |
| Observations | 15467 | 15467 | 15467 |
| Bank FE | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes |

Table 4: **First-Stage**. This table reports regression estimates of overall common ownership between banks and firms on index fund common ownership as well as bank, firm and loan characteristics. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm-Bank Index Common Own is defined as the percent of firm shares times the percent of bank shares held by the five largest index funds that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. Firm Index Common Own is defined as the percent of firm shares held by the five largest index funds that also hold shares of the lending bank at the time of loan origination. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1)<br>Firm-Bank Common Own. | (2)<br>Firm Common Own. |
|---|---|---|
| Firm-Bank Index Common Own. | 5.17*** | |
| | (0.79) | |
| Firm Index Common Own. | | 2.13*** |
| | | (0.18) |
| Observations | 15467 | 15467 |
| $R^2$ | 0.56 | 0.58 |
| Bank FE | Yes | Yes |
| Qtr FE | Yes | Yes |
| Loan Controls | Yes | Yes |
| Firm Controls | Yes | Yes |
| Bank Controls | Yes | Yes |
| 1st St. F-stat | 43.21 | 137.01 |

Table 5: **2SLS Regression Analysis of Common Ownership: Loan Spreads and Loan Size**. This table reports regressions of interest rate spreads and log loan size on common ownership between bank and firm as well as bank, firm and loan characteristics. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Panel A: Rate Spread | OLS | 2SLS | OLS | 2SLS |
| Firm-Bank Common Own | -41.58*** | -33.47* | | |
| | (6.88) | (19.21) | | |
| Firm Common Own | | | -22.86*** | -15.55** |
| | | | (4.28) | (6.19) |
| $R^2$ | 0.60 | 0.60 | 0.60 | 0.60 |
| SD Effect | -6.26 | -5.04 | -7.01 | -4.77 |
| Panel B: Log Loan Size | | | | |
| Firm-Bank Common Own | 0.04** | 0.18* | | |
| | (0.02) | (0.09) | | |
| Firm Common Own | | | 0.02* | 0.07*** |
| | | | (0.01) | (0.02) |
| $R^2$ | 0.89 | 0.89 | 0.89 | 0.89 |
| SD Effect | 0.01 | 0.03 | 0.01 | 0.02 |
| Observations | 15467 | 15467 | 15467 | 15467 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 43.21 | | 137.01 |

Table 6: **2SLS Regression Analysis of Common Ownership, Intensive Margin: Loan Spreads and Loan Size**. This table reports regressions of interest rate spreads and log loan size on common ownership between bank and firm as well as bank, firm and loan characteristics. Data is restricted to only loan observations where there exists positive common ownership. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Panel A: Rate Spread | OLS | 2SLS | OLS | 2SLS |
| Firm-Bank Common Own. | -93.95*** | -112.56* | | |
| | (16.62) | (63.29) | | |
| Firm Common Own. | | | -53.94*** | -50.48*** |
| | | | (9.87) | (17.07) |
| $R^2$ | 0.63 | 0.63 | 0.63 | 0.63 |
| SD Effect | -14.47 | -17.34 | -14.40 | -13.48 |
| Panel B: Log Loan Size | | | | |
| Firm-Bank Common Own. | 0.03 | 0.64*** | | |
| | (0.04) | (0.17) | | |
| Firm Common Own. | | | 0.03 | 0.17** |
| | | | (0.03) | (0.08) |
| $R^2$ | 0.89 | 0.88 | 0.89 | 0.89 |
| Observations | 9276 | 9276 | 9276 | 9276 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 24.70 | | 110.43 |

Table 7: **2SLS Regression Analysis of Common Ownership: Firm Outcomes**. This table reports estimates from linear probability regressions of an indicator of different firm outcomes a year after obtaining a loan on common ownership between bank and firm at the time of loan origination as well as bank, firm and loan characteristics. Panel A: Has a S&P credit rating downgrade. Panel B: Increases Profitability. Panel C: Increases Capital Expenditures. Panel D: Experiences a one percent decrease in Employment. Panel E: Experiences Asset Sales. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| Panel A: Rating Downgrade | (1)<br>OLS | (2)<br>2SLS | (3)<br>OLS | (4)<br>2SLS |
|---|---|---|---|---|
| Firm-Bank Common Own. | -0.11*** | -0.18** | | |
| | (0.03) | (0.07) | | |
| Firm Common Own. | | | -0.06*** | -0.04 |
| | | | (0.02) | (0.04) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.19 | 0.19 | 0.19 | 0.19 |
| SD Effect | -0.02 | -0.03 | -0.02 | -0.01 |
| Mean Y | 0.07 | 0.07 | 0.07 | 0.07 |

| Panel B: Profitability | | | | |
|---|---|---|---|---|
| Firm-Bank Common Own. | -0.06 | 0.11 | | |
| | (0.05) | (0.17) | | |
| Firm Common Own. | | | -0.020 | 0.04 |
| | | | (0.03) | (0.06) |
| $R^2$ | 0.13 | 0.13 | 0.13 | 0.13 |
| SD Effect | -0.00 | 0.02 | -0.01 | 0.01 |
| Mean Y | 0.49 | 0.49 | 0.49 | 0.49 |

| Panel C: Capital Expenditures | | | | |
|---|---|---|---|---|
| Firm-Bank Common Own. | 0.05 | 0.05 | | |
| | (0.05) | (0.16) | | |
| Firm Common Own. | | | 0.02 | 0.06 |
| | | | (0.02) | (0.05) |
| $R^2$ | 0.14 | 0.14 | 0.14 | 0.14 |
| SD Effect | 0.01 | 0.01 | 0.00 | 0.02 |
| Mean Y | 0.47 | 0.47 | 0.47 | 0.47 |

Table 7: (continued) **2SLS Analysis of Common Ownership: Firm Outcomes**.

| | | | | |
|---|---|---|---|---|
| Panel D: Employment Layoffs | | | | |
| Firm-Bank Common Own. | -0.04 | 0.47*** | | |
| | (0.04) | (0.15) | | |
| Firm Common Own. | | | -0.01 | 0.12** |
| | | | (0.02) | (0.05) |
| $R^2$ | 0.20 | 0.20 | 0.20 | 0.20 |
| SD Effect | -0.01 | 0.07 | -0.00 | 0.04 |
| Mean Y | 0.42 | 0.42 | 0.42 | 0.42 |

| | | | | |
|---|---|---|---|---|
| Panel E: Asset Sales | | | | |
| Firm-Bank Common Own. | -0.02 | -0.17 | | |
| | (0.04) | (0.20) | | |
| Firm Common Own. | | | -0.01 | -0.10* |
| | | | (0.02) | (0.06) |
| $R^2$ | 0.20 | 0.20 | 0.20 | 0.20 |
| SD Effect | -0.00 | -0.03 | -0.00 | -0.03 |
| Mean Y | 0.30 | 0.30 | 0.30 | 0.30 |
| Observations | 15467 | 15467 | 15467 | 15467 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 43.21 | | 137.01 |

Table 8: **2SLS Analysis of Common Ownership by Firm Size: Loan Spreads**. This table reports regression of interest rate spreads on common ownership between bank and firm interacted with an indicator for small firm size as well as bank, firm and loan characteristics as well as bank, firm and loan characteristics. Small Firm is an indicator if the firm is below the median in total assets by year among firms in the sample. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. SD Effect Int. shows the extra effect of a one standard deviation increase of common ownership times the coefficient estimated for small firms. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1)<br>OLS | (2)<br>2SLS | (3)<br>OLS | (4)<br>2SLS |
|---|---|---|---|---|
| Small Firm | 11.70** | 12.45 | 10.59* | 10.47 |
| | (4.98) | (9.20) | (5.40) | (6.92) |
| Firm-Bank Common Own. | -15.90** | -30.05 | | |
| | (7.42) | (19.88) | | |
| Firm-Bank Common Own.*Small | -74.81*** | -76.52 | | |
| | (16.81) | (52.94) | | |
| Firm Common Own. | | | -9.77* | -9.87 |
| | | | (5.02) | (6.65) |
| Firm Common Own.*Small | | | -26.79*** | -26.39** |
| | | | (5.68) | (11.92) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.60 | 0.60 | 0.60 | 0.60 |
| SD Effect | -2.40 | -4.53 | -3.00 | -3.03 |
| SD Effect Int. | -11.27 | -11.53 | -8.21 | -8.09 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 7.91 | | 12.86 |

Table 9: **2SLS Analysis of Common Ownership by Firm Size: Loan Size**. This table reports regression of log loan size on common ownership between bank and firm interacted with an indicator for small firm size as well as bank, firm and loan characteristics. Small Firm is an indicator if the firm is below the median in total assets by year among firms in the sample. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. SD Effect Int. shows the extra effect of a one standard deviation increase of common ownership times the coefficient estimated for small firms. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1)<br>OLS | (2)<br>2SLS | (3)<br>OLS | (4)<br>2SLS |
|---|---|---|---|---|
| Small Firm | -0.05*** | -0.05*** | -0.05*** | -0.05*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Firm-Bank Common Own. | 0.03 | 0.18* | | |
| | (0.02) | (0.10) | | |
| Firm-Bank Common Own.*Small | 0.04 | 0.06 | | |
| | (0.03) | (0.12) | | |
| Firm Common Own. | | | 0.01 | 0.06** |
| | | | (0.01) | (0.03) |
| Firm Common Own.* Small | | | 0.02 | 0.02 |
| | | | (0.02) | (0.02) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.89 | 0.89 | 0.89 | 0.89 |
| SD Effect | 0.00 | 0.03 | 0.00 | 0.02 |
| SD Effect Int. | 0.01 | 0.01 | 0.01 | 0.00 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 7.91 | | 12.86 |

Table 10: **2SLS Analysis of Common Ownership by Firm Rated Status: Loan Spreads**. This table reports regression of interest rate spreads on common ownership between bank and firm interacted with an indicator for a firm not having a S&P credit rating as well as bank, firm and loan characteristics. No Rating is an indicator if the firm does not have a credit rating by S&P at the time of loan origination. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. SD Effect Int. shows the extra effect of a one standard deviation increase of common ownership times the coefficient estimated for firms with no credit rating at the time of loan origination. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1)<br>OLS | (2)<br>2SLS | (3)<br>OLS | (4)<br>2SLS |
|---|---|---|---|---|
| No Rating | 71.14*** | 71.56*** | 68.75*** | 69.26*** |
| | (20.06) | (21.85) | (19.68) | (20.67) |
| Firm-Bank Common Own. | -12.88 | -24.48 | | |
| | (8.26) | (26.28) | | |
| Firm-Bank Common Own.*No Rating | -104.29*** | -111.84 | | |
| | (24.61) | (72.69) | | |
| Firm/Bank Connected Pct. | | | -8.07 | -7.17 |
| | | | (5.07) | (8.73) |
| Firm Common Own.*No Rating | | | -39.61*** | -41.40* |
| | | | (7.25) | (21.73) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.60 | 0.60 | 0.60 | 0.60 |
| SD Effect | -1.94 | -3.69 | -2.48 | -2.20 |
| SD Effect Int. | -15.71 | -16.85 | -12.14 | -12.69 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 8.19 | | 19.50 |

Table 11: **2SLS Analysis of Common Ownership by Firm Rated Status: Loan Size**. This table reports regression of interest rate spreads on common ownership between bank and firm interacted with an indicator for a firm not having a S&P credit rating as well as bank, firm and loan characteristics. No Rating is an indicator if the firm does not have a credit rating by S&P at the time of loan origination. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. SD Effect Int. shows the extra effect of a one standard deviation increase of common ownership times the coefficient estimated for firms with no credit rating at the time of loan origination. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1) OLS | (2) 2SLS | (3) OLS | (4) 2SLS |
|---|---|---|---|---|
| No Rating | -0.09* | -0.08 | -0.09* | -0.08 |
| | (0.05) | (0.06) | (0.05) | (0.05) |
| Firm-Bank Common Own. | 0.04** | 0.18* | | |
| | (0.02) | (0.09) | | |
| Firm-Bank Common Own.*No Rating | 0.02 | 0.02 | | |
| | (0.03) | (0.08) | | |
| Firm Common Own. | | | 0.01 | 0.07** |
| | | | (0.01) | (0.02) |
| Firm Common Own.*No Rating | | | 0.02 | 0.02 |
| | | | (0.02) | (0.03) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.89 | 0.89 | 0.89 | 0.89 |
| SD Effect | 0.01 | 0.03 | 0.00 | 0.02 |
| SD Effect Int. | 0.00 | 0.00 | 0.01 | 0.00 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 8.19 | | 19.50 |

Table 12: **2SLS Analysis of Common Ownership: LPM Lead Arranger**. This table reports estimates from a linear probability regression of an indicator on the bank being the lead arranger out of all banks in the syndicate on common ownership between bank and firm at the time of loan origination as well as bank, firm and loan characteristics. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. F-stats from the first stage are reported. Regression include bank and credit facility fixed effects. Bank Controls include bank assets and capitalization measures. Standard errors clustered by credit facility and quarter are reported in parenthesis.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | OLS | 2SLS | OLS | 2SLS |
| Firm-Bank Common Own. Pct. | 0.09*** | 0.04 | | |
| | (0.03) | (0.10) | | |
| Firm Common Own. Pct. | | | 0.06*** | 0.04 |
| | | | (0.02) | (0.04) |
| Observations | 75394 | 75394 | 75394 | 75394 |
| $R^2$ | 0.31 | 0.32 | 0.32 | 0.31 |
| SD Effect | 0.01 | 0.01 | 0.02 | 0.01 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 48.24 | | 129.97 |

Table 13: **2SLS Analysis of Common Ownership: Number of Banks in Loan Syndicate.** This table reports estimates from a regression of the number of banks in the loan syndicate on common ownership between bank and firm at the time of loan origination as well as bank, firm and loan characteristics. Firm-Bank Common Own is defined as the percent of firm shares times the percent of bank shares held by institutional investors that hold shares in both the firm and the bank at the time of loan origination. Firm Common Own is defined as the percent of firm shares held by institutional investors that also hold shares of the lending bank at the time of loan origination. In the first stage, both connected percentage variables are regressed on the equivalent variables constructed with only index fund holdings. SD Effect shows the effect of a one standard deviation increase of common ownership times the coefficient estimated. F-stats from the first stage are reported. Firm Controls include assets, tangibility, profitability, market capitalization, quarters since first loan with the bank, credit rating, Tobin q and industry and state fixed effects. Bank Controls include bank assets and capitalization measures. Loan Controls include maturity, loan type and loan purpose. Standard errors clustered by bank and quarter are reported in parenthesis.

| | (1)<br>OLS | (2)<br>2SLS | (3)<br>OLS | (4)<br>2SLS |
|---|---|---|---|---|
| Firm-Bank Common Own. | 1.04*** | 4.30** | | |
| | (0.32) | (1.99) | | |
| Firm Common Own. | | | 0.32* | 1.59*** |
| | | | (0.19) | (0.41) |
| Observations | 15467 | 15467 | 15467 | 15467 |
| $R^2$ | 0.58 | 0.58 | 0.58 | 0.58 |
| SD Effect | 0.16 | 0.65 | 0.10 | 0.49 |
| Mean Y | 5.37 | 5.37 | 5.37 | 5.37 |
| Bank FE | Yes | Yes | Yes | Yes |
| Qtr FE | Yes | Yes | Yes | Yes |
| Loan Controls | Yes | Yes | Yes | Yes |
| Firm Controls | Yes | Yes | Yes | Yes |
| Bank Controls | Yes | Yes | Yes | Yes |
| 1st St. F-stat | | 43.21 | | 137.01 |