Received: 11 September 2019 | Revised: 27 June 2020 | Accepted: 16 December 2020

DOI: 10.1111/jbfa.12517

JBFA

ARTICLE

Informed equity ownership and bank loan contracting

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Abstract

Banks enter into loan contracts facing information asymmetries that demand costly due diligence and monitoring efforts. We hypothesize that enhanced monitoring could reduce information asymmetry and result in more favorable loan terms. We take local institutional ownership (IO) as a proxy for informed equity ownership that signals less information asymmetry and study the effect of informed *equity* ownership on *creditors* (bank loan contracting). We show that concentrated local long-term institutional ownership (LLTIO) is associated with (1) a lower spread, (2) less stringent collateral requirement, and (3) less covenant intensity when shareholder–creditor conflicts of interest are unlikely and substituting monitoring devices are not in place. Our results are robust to controls for the endogeneity of IO. The findings suggest that the net effect from LLTIO's monitoring leads to more favorable loan terms and varies with the trade-off in agency costs that creditors face.

KEYWORDS
bank loan contracting, information asymmetry, institutional ownership, local, monitor

JEL CLASSIFICATION
G21, G3, G32

1 | INTRODUCTION

It is well-documented that as informed creditors, banks transmit information on their willingness to monitor capital markets and move stock prices (Byers et al., 2008; James, 1987; Lummer & McConnell, 1989). Little is known,

however, whether and how informed *equity* ownership conveys information to *creditors*. This paper aims to fill the gap by investigating the effect of local institutional investors, which is our proxy for informed equity ownership, on price and non-price terms in bank loan contracting.

An emerging literature recognizes that geographic proximity between the headquarters of institutional investors and firms enables institutions to possess private information and documents informational advantage of local equity ownership. For example, mutual funds (Coval & Moskowitz, 1999, 2001) and institutional investors (Baik et al., 2010), in general, earn superior returns on stocks of local firms. Local mutual funds are associated with improved corporate governance and reduced stock liquidity (Gaspar & Massa, 2007). Mutual fund managers overweight stocks from their managers' home states and the home-state overweighting is more pronounced where perceived information advantage is more salient (Pool et al., 2012). In addition, the effect of institutional ownership (IO) on corporate governance varies with distance: The closer the institutions are located, the better the corporate governance (Chhaochharia et al., 2012). Furthermore, the main determinant of proximity, namely, the location of the investor, predates the investment relationship and therefore is reasonably exogenous (Gaspar & Massa, 2007).[1] So using local institutional investors as a proxy for informed equity ownership mitigates the concern that ownership is usually endogenous, and the effect of informed ownership is often difficult to show (Demsetz & Lehn, 1985).

We focus on bank loan contracting, as it is an important source of debt financing. For example, Nini et al. (2009) report that roughly 80% of all public firms in the United States have private credit agreements in place. Bank loan contracts also provide rich information about debt, including price and non-price terms (Sufi, 2009; Yi & Mullineaux, 2006), which enables our multidimensional exploration. Banks enter into loan contracts facing information asymmetries that demand costly due diligence and monitoring efforts (Diamond, 1984, 1991; Rajan, 1992). For example, banks grant more favorable terms in loan contracts when mechanisms that alleviate information asymmetry are in place (De Franco et al., 2017; Hasan et al., 2012; Hsieh, Song, Wang, & Wang, 2019).

Although informed equity ownership alleviates information asymmetry and its presence can lead to more favorable loan terms, the likely interaction between equity holders and creditors suggests a more profound effect of informed equity ownership on bank loan contracting. Indeed, theory points out that the presence of informed equity ownership can reflect superior information, or lower shareholder-manager agency cost due to long-term monitoring, or higher agency cost of debt due to conflicts of interest between creditors and shareholders, or a mix of these effects (Grossman & Hart, 1980; Khan & Winton, 1998; Maug, 1998; Shleifer & Vishny, 1997). The heterogeneous nature of IO further confounds the benefit-cost analysis so that the exact role of informed equity ownership is not clear a priori. In this paper, we hypothesize that the effect of informed equity ownership on bank loan contracting depends on the cost-benefit calculus due to its presence. That is, we hypothesis that *ceteris paribus*, bank loan contracts have more favorable terms when a firm's informed equity ownership provides them with more benefits than costs.

To address the confounding effects, we use investment horizon to differentiate IOs and focus on local institutions with long-term investment horizon, as it provides strong clues with respect to the role of IOs (Harford et al., 2018). For example, long-term IOs are associated with stronger monitoring effects (Gaspar et al., 2005) than short-term ownerships. IOs with a short-term investment horizon, however, trade more frequently with their private information and are positively associated with future stock returns (Baik et al., 2010; Khan & Winton, 1998; Yan & Zhang, 2009). By limiting the study to the effect of long-term informed equity investors on loan contracting, we can filter out the confounding effect from pure private information and trading noise that follows and focus on the analysis of the benefits and costs to creditors likely due to institutional monitoring.

Further, we investigate the effect of local ownership among the largest 10 institutional owners measured by their equity stakes in a firm (Top10LIO). Large stakes in the firm not only subject an institutional investor to great underdiversification risks (Leland & Pyle, 1977) but also give it stronger monitoring incentives (Chen et al., 2007; Hartzell & Starks, 2003). Top10LIO thus conveys convincing information to creditors.

[1] Kang and Kim (2008) make a similar argument. Our empirical results also support the exogeneity of local ownership.

Using a sample of borrowing firms from the US syndicated loan market over 1995–2009, we find that after controlling for other known factors, the borrower's local long-term institutional ownerships (LLTIOs), belonging to the 10 largest shareholders (Top10LLTIOs), to be *consistently* negatively associated with the loan spread charged, indicating that syndicate lenders view the presence of Top10LLTIOs as positive. The local short-term institutional ownerships (LSTIOs) with large stakes (Top10LSTIO), however, are *not* associated with lower loan spreads, suggesting that syndicate lenders do not view the presence of LSTIOs who are likely to trade instead of monitoring as positive. We refer to the negative relation between the Top10LLTIOs and loan spreads as the "LLTIO effect," which is a net effect on loan terms that are influenced by agency costs caused by both shareholder-manager and shareholder-creditor conflicts of interest and focus on it in this paper. Although what we observe is a net effect caused by the LLTIOs, the magnitude of the LLTIO effect is non-trivial: In response to a 1 percentage point increase of LLTIO, there is a nominal reduction of 0.163 log loan spread, corresponding to approximately 3.3% lower log loan spread for the borrower, as the average log loan spread is 4.883 in our sample. With the average log loan amount for our sample being 4.869, which is about US$130 million, a 3.3% savings would be about US$4 million a year. With an average loan maturity of 48 months (4 years), the average savings per loan amounts to US$16 million.

In addition to examining the *price* terms of the loan contracts, we investigate the effect of Top10LLTIO on *non-price* terms of the loan contracts in separate regressions. We find that the presence of Top10LLTIO is associated with fewer covenant restrictions and less collateral, supporting our hypothesis.

To better understand the source of benefits and costs of Top10LLTIO, we examine the likelihood of observing material threat to creditors or managerial opportunistic behavior, and how the LLTIO effect varies with the severity of conflicts of interest between creditors and shareholders. Specifically, we investigate the probability of covenant violation in a certain year (Roberts & Sufi, 2009), "lucky" chief executive officer (CEO) (Bebchuk et al., 2010), and the level of the entrenchment index (E-index; Bebchuk et al., 2009) for possible benefits from Top10LLTIO. We also consider situations where creditor-shareholder conflicts of interest are higher, including crisis period, firms with high bankruptcy risk, and poor credit ratings. Findings from these tests are consistent with our hypothesis that the effect of Top10LLTIO on loan terms varies with the benefits and costs to the creditors: More favorable terms when benefits from monitoring help creditors and less so when agency cost of debt is higher.

We next investigate the possibility of endogeneity problems encountered in evaluating the price effect of information asymmetry in the syndicated loan market (Sufi, 2007). We address the omitted variable concern by controlling for time-varying industry and bank fixed effects (FE). We estimate regressions with the interaction of Top10LLTIO and variables that are documented to influence loan spreads and use a system of equations to address the concern that price and non-price terms influence each other for most loans (Bharath et al., 2011). We also limit Top10LLTIO to top 10 local quasi-indexer IO (Top10LQIO), which includes only index-tracking institutional investors that do not select their investments and document a negative and significant relation between bank loan spread similar to the LLTIO effect. Furthermore, we include time-varying location FE to mitigate concerns caused by unobserved time-varying economic reasons that attract firms to cluster in the same area, and we also employ instrumental variable (IV) regressions and propensity matching to address the endogeneity concerns. The results from these alternative empirical designs remain the same as the results from our base model and further imply that Top10LLTIOs' long-term monitoring role conveys favorable information for bank loan contracting.

Our findings contribute to the existing literature in several ways. First, to the best of our knowledge, our paper is the first to investigate the effect of concentrated informed institutional equity ownership on both price and non-price terms in private debt contracting. Hence, it provides evidence on how local institutional equity ownership influences *creditors*. Second, we show that the mechanism through which informed ownership influences loan contracting terms is the long-term monitoring role of LLTIO. Short-term local IO (LIO) does not display such an effect despite the superior information they may possess that is reflected in frequent trading. Finally, the net effect of the LLTIOs varies with the strength of shareholders' monitoring mechanisms that benefit creditors and the severity of shareholder-creditor conflicts of interest.

2 | LLTIO AND BANK LOAN PRICING

Internationally, syndicated loans represent an important and fast-growing source of financing for corporations, with $2.1 trillion in such loans issued in the first half of the year 2015 according to Thomson Reuters' *Global Syndicated Loans Review*. Chui et al. (2010) reported that global syndicated loan volume is more than the total value of corporate borrowing in the global bond markets. According to Thomson Reuters, the US-leveraged loan issue, a subset of all syndicated loans issued in the United States, reached $664 billion in 2013. Secondary loan trading in the country also exceeded $600 billion in 2014. Of the 500 largest Compustat firms, 90% have obtained syndicated loans (Sufi, 2007).

The impact of IO on the cost of debt has remained an interesting question without a simple answer (Anderson et al., 2003). The lack of consensus is probably due to the confounding effects caused by highly heterogeneous IO (Agrawal, 2012; Brickley et al., 1988; Chang et al. (in press); Del Guercio, 1996) and the offsetting benefits from monitoring IO. While local LSTIOs may possess private information on the borrowing firm *ex-ante*, their short-term investment horizon suggests that they will have little monitoring incentive (Chen et al., 2007; Gaspar et al., 2005). Further, as IO stability reduces a firm's cost of debt (Elyasiani et al., 2010), frequent trading by LSTIOs leads to more uncertainty and hurts creditors. Since it is difficult for creditors to measure and benefit from LSTIOs' private information, we do not expect more favorable bank loan terms in the presence of informed short-term equity IO like LSTIO and focus on informed long-term equity IO that is likely to monitor instead.

LLTIOs with concentrated stakes can serve as an external monitor for the borrower, alleviating moral hazard problems over the long term. Geographic proximity provides a cost-benefit justification for monitoring and facilitates intense monitoring through frequent interactions with local firms and other stakeholders. Gaspar and Massa (2007) and Kang and Kim (2008) show such proximity to reduce both transportation and communication costs and encourage local investors to get involved. Concentrated ownership and a long-term investment horizon are additional characteristics that contribute to lower monitoring costs (Gaspar et al., 2005; Hartzell & Starks, 2003). Therefore, LLTIOs with large stakes serve as an external monitoring mechanism for the borrower and alleviate moral hazard problems over the long term. Indeed, Chhaochharia et al. (2012) and Gaspar and Massa (2007) show that LIO is associated with improved corporate governance, which can lead to a lower cost of capital (Ge et al., 2012; Stulz, 1999).

While monitoring IO lowers shareholder-manager agency cost and benefits investors, creditors are also concerned about the potential increase in the conflicts of interest between shareholders and creditors caused by a powerful equity holder. For example, Jensen and Meckling (1976) state that diversified shareholders have incentives to expropriate creditor wealth by investing in risky, high expected-return projects and refer to it as agency cost of debt. Later, Shleifer and Vishny (1997) point out that large, undiversified shareholders may have different incentives from small and well-diversified shareholders. Nevertheless, creditors' reaction to the presence of monitoring IO should be a net effect from mitigated shareholder-manager agency cost and potentially higher agency cost of debt. We, therefore, hypothesize that when conflicts of interest between creditors and shareholders are trivial, the presence of informed long-term institutional equity ownership leads to more favorable loan terms by mitigating shareholder-manager agency cost.

H1: There is a negative relation between loan spread and Top10LLTIO.

The magnitude of the improved loan spread depends on the number of net monitoring benefits from Top10LLTIO that creditors can enjoy. When the monitoring need is little or the syndicate already enjoys the monitoring benefits from geographic proximity, either because the loans are secured or the lenders are geographically proximate, we expect the LLTIO effect on loan pricing to vanish. Therefore, we have the following alternative hypothesis:

H1a: The negative relation between loan spreads and Top10LLTIO is less salient when there are fewer marginal monitoring benefits due to other monitoring devices.

Furthermore, we expect the LLTIO effect on loan pricing to be less salient when conflicts of interest between creditors and shareholders are high. In case of elevated conflicts of interest between the two, a gain to the latter could be synonymous with a loss to the former, such as in a high level of financial distress, because shareholders selfishly exert their influence on corporate decisions at the expense of creditors (Jensen & Meckling, 1976; Myers, 1977). The well-documented non-linear relation between equity ownership and cost of debt also suggests that when Top10LLTIO is a significant percentage in the ownership structure, the agency cost of debt could outweigh the benefits from Top10LLTIO monitoring for creditors (Anderson et al., 2003; McConnell & Servaes, 1990). We, therefore, hypothesize that

H2: The negative relation between loan spreads and Top10LLTIO is less salient when conflicts of interest between creditors and shareholders are higher.

Non-price loan terms, including covenants, collateral, fees charged, and so forth, are important components of the total cost of a syndicated loan as they either restrict corporate policies or demand extra resources (Jensen & Meckling, 1976; Smith & Warner, 1979). Consistent with H1 for pricing terms, we hypothesize that

H3: Top10LLTIO is associated with improved non-price loan terms.

3 | DATA AND SUMMARY STATISTICS

Our bank loan data come from the Thomson Reuters LPC DealScan database and our information on financial characteristics and stock returns from Compustat and the Center for Research in Security Prices, respectively. We also obtain IO data from the Thomson Reuters 13F database. We match the DealScan dataset with the Compustat dataset using the list of identifiers constructed and updated following Chava and Roberts (2008). Our sample excludes financial and regulated utility industry borrowers and non-US borrowers. The final sample includes 16,658 loan deals with financial and stock information on 3810 unique borrowing firms, which have non-zero IO over from 1995 to 2009. We report the variable definitions in the Appendix and summary statistics in Table 1.

3.1 | Loan data

DealScan collects loan-level data, mostly on syndicated loans, from various sources, including annual reports, reports from loan originators, and Securities and Exchange Commission (SEC) filings. Syndicated loans are medium- or large-sized loans extended to firms by a group of lenders. In a typical syndicated loan contract, a small number of lenders, called lead lenders or arrangers, head up a group of participating banks that jointly issue a relatively large loan package to share the risk and meet capital requirements. Our research variable is the all-in-drawn spread (*spread*) for syndicated loans, which, according to the DealScan definition, is the total annual cost in basis points paid over the London Interbank Offered Rate (LIBOR) for each dollar used under the loan commitment.

3.2 | IO data

Form 13F mandatory institutional reports are filed with the SEC on a calendar quarter basis and are compiled by Thomson Reuters (formerly known as the 13F credit default swaps (CDS)/Spectrum database). The SEC requires all

TABLE 1 Summary statistics

Variable	N	Mean	Median	SD	Min	Max
Spread	16,658	179.843	162.500	131.012	2.700	1500.000
Logspread	16,658	4.883	5.091	0.870	0.993	7.313
Urban10	16,658	0.326	0.000	0.469	0.000	1.000
Close bank	6784	0.035	0.000	0.184	0.000	1.000
Relation dummy	16,658	0.445	0.000	0.497	0.000	1.000
Top3bank	16,658	0.401	0.000	0.490	0.000	1.000
IO	16,658	0.579	0.617	0.265	0.003	1.000
Top10 IO	16,658	0.289	0.301	0.159	0.000	0.660
Top10 Localown	16,658	0.093	0.000	0.177	0.000	0.866
Top10 STIO	16,658	0.072	0.051	0.072	0.000	0.337
Top10 LTIO	16,658	0.216	0.213	0.137	0.000	0.580
Top10LSTIO	16,658	0.020	0.000	0.062	0.000	0.390
Top10LLTIO	16,658	0.069	0.000	0.144	0.000	0.745
TA (million US$)	16,658	3535.737	784.346	7864.997	23.779	55,272.000
LogTA	16,658	6.754	6.665	1.701	2.827	10.893
Leverage	16,658	0.307	0.283	0.211	0.000	1.016
Tobin's Q	16,658	1.752	1.444	0.999	0.699	6.565
ROA	16,658	0.030	0.041	0.095	−0.445	0.239
Div dummy	16,658	0.489	0.000	0.500	0.000	1.000
NFA/TA	16,658	0.321	0.264	0.228	0.013	0.901
STD CF	16,658	0.046	0.028	0.058	0.003	0.386
Modified Z	16,658	1.760	1.767	1.268	−2.118	5.077
Log(Loan amount)	16,658	4.869	4.977	1.450	−1.799	10.309
Number of lenders	16,658	8.625	6.000	8.917	1.000	118.000
Performance pricing	16,658	0.570	1.000	0.495	0.000	1.000
Secured loan	16,658	0.530	1.000	0.499	0.000	1.000
Missing Secured	16,658	0.274	0.000	0.446	0.000	1.000
St revolver	16,658	0.125	0.000	0.331	0.000	1.000
Lt revolver	16,658	0.561	1.000	0.496	0.000	1.000
Term loan	16,658	0.259	0.000	0.438	0.000	1.000
Maturity	16,658	48.020	58.000	23.762	1.000	252.000
LT CR rating	8272	12.561	12.000	3.463	1.000	22.000
Invgrade	16,658	0.239	0.000	0.426	0.000	1.000
Invgrade2	8272	0.481	0.000	0.500	0.000	1.000
Rated	16,658	0.497	0.000	0.500	0.000	1.000
Term spread	16,658	0.809	0.490	0.854	−0.410	2.830
Credit spread	16,658	0.880	0.810	0.345	0.550	3.380
Repay purpose	16,658	0.195	0.000	0.396	0.000	1.000
CP backup purpose	16,658	0.075	0.000	0.263	0.000	1.000

(Continues)

TABLE 1 (Continued)

Variable	*N*	Mean	Median	SD	Min	Max
Working capital purpose	16,658	0.181	0.000	0.385	0.000	1.000
Buyback purpose	16,658	0.012	0.000	0.108	0.000	1.000
Takeover purpose	16,658	0.199	0.000	0.400	0.000	1.000
LBO purpose	16,658	0.042	0.000	0.200	0.000	1.000
Project purpose	16,658	0.004	0.000	0.063	0.000	1.000
Others purpose	16,658	0.031	0.000	0.173	0.000	1.000

Notes: This table reports the summary statistics for our sample period from 1995–2009. An institutional owner is defined as "local" if the headquarters of the institution is within a 100-mile radius of the company's headquarters. Annual Compustat data are matched to Thomson Reuters DealScan data using the identifiers of Chava and Roberts (2008). We exclude securities with share codes different from 10 or 11, financial and utilities companies, borrowers incorporated or headquartered outside the United States, loans originated outside of the United States, loans denominated in foreign currencies, loans with benchmark rates other than the London Interbank Offered Rate (LIBOR), and observations with missing data. The sample includes 16,658 firm-loan observations and the list of variable definitions and measurements is shown in the Appendix.

institutions with more than $100 million under management at the end of the year to file form 13F reporting their long positions in equity[2] in the next year.

A firm's local investors are defined as those located within a short distance. As we cannot differentiate holdings by the local offices of the same institutional investor, we focus on the location of the corporate headquarters of the management company to identify local institutional investors, which is similar to the approach used by Baik et al. (2010) and Gaspar and Massa (2007). Also, similar to Knyazeva et al. (2013), we obtain corporate headquarters locations and firm-level financial variables from the Compustat database. If the information on the corporate headquarters location is missing, we obtain it manually. We identify the institutional location (zip code) by manually searching the SEC Electronic Data Gathering, Analysis, and Retrieval (EDGAR) site for historical 13F filings.

Consistent with John et al. (2011), we use the distance between the corporate headquarters of firms and the headquarters of institutional investors to identify LIO. Like Baik et al. (2010), we exclude cases in which either the firms or institutional investors are located in Alaska, Hawaii, Puerto Rico, or the Virgin Islands. We first identify the 10 institutional investors with the largest stakes in a firm and calculate the percentage of shares owned by these top 10 owners (*Top10IO*). We then calculate the percentages of shares owned by long-term and short-term investors[3] whose headquarters are located within a 100-mile radius of the firm's headquarters.[4] We use the percentages, including those of concentrated overall local, local long-term, and local short-term IO (*Top10Localown*, *Top10LLTIO*, and *Top10LSTIO*, respectively), as a proxy for informed equity ownership. The overall LIO (*Top10Localown*) for firm *j* is calculated as

[2] The reported positions are those in which the institution owns more than 10,000 shares or with a market value greater than $200,000.

[3] Following Bushee (2001), we categorize ownership by institutional owners who are either dedicated or quasi-indexers as long-term IO. According to Bushee (1998), dedicated institutional investors are characterized by large average investments in portfolio firms with extremely low turnover ratios, whereas quasi-indexers are characterized by low turnover and diversified holdings. He argues that both types of investors provide firms with long-term, stable ownership because they are geared toward longer-term benefits, be it benefits dividend income or capital appreciation (Bushee, 2001). We thank Brian Bushee for providing institutional investor classification data (1981–2009) on his website: https://acct3.wharton.upenn.edu/faculty/bushee/.

[4] Coval and Moskowitz (1999, 2001) and Gaspar and Massa (2007) use a 100-km radius as a measure of locality, whereas Ivkovic and Weisbenner (2005) set 250 miles as the maximum radius for local investors, and Baik et al. (2010) adopt state identifiers to identify local institutional investors. The distance, $d_{i,j}$, between the headquarters of institutional owner *i* and firm *j* is calculated as follows: $d_{i,j} = \arccos(deg_{latlon}) \times \frac{2\pi r}{360}$, where $deg_{latlon} = \cos(lat_i) \times \cos(lon_i) \times \cos(lat_j) \times \cos(lon_j) + \cos(lat_i) \times \sin(lon_i) \times \cos(lat_j) \times \sin(lon_j) + \sin(lat_i) \times \sin(lat_j)$, *lat* and *lon* are the latitudes and longitudes of the institutional owner and firm, and *r* is the radius of the earth (approximately 3959 miles).

follows:[5]

$$Top10Localown_j = \frac{\sum_{i \in L_j} V_{i,j}}{\sum_{i \in I} V_{i,j}} \quad (1)$$

where L_j is the set of the 10 largest institutions based on shares of firm j owned that are headquartered within a 100-mile radius of firm j's headquarters, I is the universe of all 10 of the largest institutions based on their stake in firm j, and $V_{i,j}$ is the dollar value of institutional owner i's stake in firm j

$$Top10LLTIO_j = \frac{\sum_{i \in LLT_j} V_{i,j}}{\sum_{i \in I} V_{i,j}}, \quad (2)$$

$$Top10LSTIO_j = \frac{\sum_{i \in LST_j} V_{i,j}}{\sum_{i \in I} V_{i,j}}, \quad (3)$$

Top10LLTIO and *Top10LSTIO* are calculated similarly as described in Equations (2) and (3), where $Top10LLTIO_j$ and $Top10LSTIO_j$ are *Top10Localowns* who have long- and short-term investment horizons, respectively, according to Bushee's categorization: Long-term institutional investors include dedicated and quasi-indexers and short-term include transient institutions.

3.3 | Control variables

We include borrower characteristics, loan and bank characteristics, macro-economic variables, and industry dummies as our control variables. Borrower characteristics include firm size, asset tangibility, profitability, financial distress (modified *Z*), leverage, credit rating, stock volatility, prior banking relationship status, and IO. Loan characteristics include loan amount, whether the loan is secured, loan type, maturity, loan facility amount, loan purpose, number of lenders, performance pricing status. Bank characteristics include bank FE that include, and are not limited to, headquarters location and reputation. The macro-economic control variables include term spread, credit spread, and year and Standard Industrial Classification (SIC) two-digit industry interaction FE to capture time-varying market conditions for industries. The terms spread and credit spread are measured on an annual basis. We also include bank FE to control for the lender effect and each top3 bank and year interaction FE to capture time-varying financial strengths of each of the top three banks: JP Morgan Chase, Bank of America, and Citi Bank.

Firm size and the average debt issue size serve as proxies for economies of scale in flotation costs following Krishnaswami et al. (1999). Also, large public borrowers are usually covered by many analysts, and accordingly, more public information is available on such borrowers. Hence, we expect a negative relation between firm size and *spread*. *Leverage* is a proxy for the observable default risk, and we expect a positive relationship between it and *spread* (Carey et al., 1998; Merton, 1974). Similarly, information asymmetry is less severe for dividend-paying firms, and borrowing firms with a previous banking relationship with the lead bank (Berger & Udell, 1995; Petersen & Rajan, 1994). We thus expect a negative relation between both *Div dummy* and *Relation dummy* and *spread*. As tangible assets are easier to value than intangible assets, we expect a negative relation between asset tangibility, *NFA/TA*, which is measured as the ratio of net fixed assets to total assets, and *spread*. Return on assets (*ROA*) captures borrower profitability and is

[5] Coval and Moskowitz (2001) and Gaspar and Massa (2007) define local ownership as the "excess" local ownership in one firm relative to the benchmark expected for the particular locality in which it is headquartered. We use actual LIO out of the top 10 largest shareholders, an approach similar in spirit to that adopted by Baik et al. (2010). This measure enables us to calculate changes in ownership and assess the effect on alleviation of information asymmetry.

expected to have a negative association with *spread*. IO is documented to have a negative non-linear relation with loan spread because of its monitoring role (Bhojraj & Sengupta, 2003).

Loan Amount is measured at the facility level and has been shown to be related to both price and non-price terms of bank loan contracts (Demiroglu & James, 2010). Similar to Ge et al. (2012), we take each facility as a separate observation as loan characteristics and terms are different across facilities. *Performance Pricing* is a dummy variable that takes a value of 1 if the loan carries a provision that makes the spread charged on the loan a function of the borrower's current credit rating or their financial ratios and 0 otherwise. By establishing *ex-ante* how changes in credit quality affect spread, we expect the performance pricing provision to have a negative effect on spread. Fixed bank effects like the geographic location of the bank can account for differential lending activity across states (Hollander & Verriest, 2016) and bank reputation is shown to discourage banks from shirking (Dennis & Mullineaux, 2000; Ross, 2010). Two dummies, *Secured Loan* and *Missing Secured* capture how the loan is secured: *Secured Loan* is set to 1 if the loan is secured by collateral and 0 otherwise while *Missing Secured* is set to 1 if the information on loan collateral is missing and 0 otherwise.

Table 1 presents summary statistics at the loan level. Syndicated loans are issued as a package deal, with each deal possibly comprising multiple revolvers (or credit lines) and term loans (or installment loans). Loan-level presentation provides a good picture of our sample because revolvers and term loans contain different loan specifications. Our sample comprises 16,658 loans from 1995 to 2009. The average loan spread is about 180 basis points above the LIBOR. There is a wide variation in the spreads for our sample, with a minimum spread of 2.7 basis points and a maximum spread of 1500 basis points.[6] About half were the outcome of repeat loans from the same set of lead lenders and borrowers. Approximately 40% of the loans were issued by the three banks with the largest dollar volume of syndications, namely, JP Morgan Chase, Bank of America, and Citi Bank. According to Ross (2010), these three banks accounted for almost half of the total syndicated loan volume, measured in dollars, from 2000 to 2008.

On average, the 10 largest institutional investors (Top10IO) hold 29% of the equity in a borrowing firm, with long-term investors constituting the majority (Top10LTIO) holding 22% of ownership. Local owners (Top10Localown) are a relatively minor group (approximately 9% of the top 10 ownership), with the long-term investors among them accounting for roughly 7% of the top 10 ownership. About 3.5% of loans were obtained by borrowing firms located within 100 miles of the lead syndicate lenders. On average, the book value of the sample borrowing firms is approximately $3.5 billion, with a leverage level of 31%. Approximately a half (49%) of loans were obtained by firms paying dividends. About 24% of loans were obtained by investment-grade firms (with long-term credit ratings of BBB or above), and the rest were by either speculative-grade firms (with long-term credit ratings below BBB) or not rated firms. Among rated firms, roughly a half of the loans (48%) were obtained by investment-grade firms. Approximately 56% of the loans are long-term revolvers, and 26% are term loans, and the average maturity is about 48 months. About 53% of the loans are secured with collateral (*Secured Loan*), 27% have missing information (*Missing Secured*) and the remaining 20% are not secured loans.

Panel A of Table 2 shows the summary statistics for firm and loan characteristics with high and low *Top10LLTIO* and *Top10LSTIO*, respectively. If a loan is associated with 5% and greater *Top10LLTIO (Top10LSTIO)*, it belongs to the *high Top10LLTIO (Top10LSTIO)* group and to the *low Top10LLTIO (Top10LSTIO)* group otherwise. The univariate statistics show that, relative to those in the *low Top10LLTIO* group, loans in the *high Top10LLTIO* group have a lower loan spread (157 basis points versus 189 basis points on average), are more likely to be obtained by firms with a previous banking relationship with the current lenders, issued by the top-three reputable banks, from larger, more profitable and more likely dividend-paying firms, with a lower level of leverage, and are less risky as measured by credit ratings, leverage, and modified Altman-Z. With the exception of the long-term revolvers and performance pricing, all of the mean differences are statistically significant with a confidence level of 1% or better.

[6] A closer examination of our sample identifies multiple loans with a spread of more than 1000 basis points, suggesting that the wide variation in loan spread is unlikely to be a recording mistake. Our results remain largely the same after removing the extreme observations as we use the logarithms of *spread* to minimize the impact of outliers.

TABLE 2 Univariate tests

Panel A. Loan spread by high versus low top 10 local long-term institutional ownership (*Top10LLTIO*) and short-term institutional ownership (*Top10LSTIO*)						
	Top10LLTIO		Difference	Top10LSTIO		Difference
Variables	High	Low	(Low–high)	High	Low	(Low–high)
Spread	157.153	188.642	31.489***	176.554	180.299	3.745
Relation Dummy	0.527	0.479	−0.047***	0.510	0.490	−0.020*
Top3bank	0.461	0.377	−0.083***	0.415	0.399	−0.016
Top10 IO	0.313	0.280	−0.033***	0.317	0.285	−0.031***
Top10 Localown	0.297	0.013	−0.284***	0.334	0.059	−0.276***
Top10LSTIO	0.046	0.010	−0.036***	0.155	0.001	−0.154***
Top10LLTIO	0.245	0.002	−0.243***	0.164	0.056	−0.108***
LogTA	7.008	6.656	−0.352***	6.675	6.765	0.090**
Leverage	0.287	0.314	0.027***	0.294	0.308	0.014***
ROA	0.036	0.028	−0.008***	0.033	0.029	−0.003
Div dummy	0.549	0.465	−0.084***	0.394	0.502	0.108***
Modified Z	1.836	1.730	−0.106***	1.703	1.767	0.064**
Log(Loan amount)	5.023	4.809	−0.214***	4.785	4.880	0.095***
Performance pricing	0.563	0.572	0.009	0.592	0.566	−0.026**
Secured loan	0.444	0.563	0.119***	0.536	0.529	−0.007
Lt revolver	0.561	0.561	−0.000	0.570	0.560	−0.010
Term loan	0.231	0.270	0.039***	0.261	0.259	−0.003
Maturity	46.011	48.795	2.784***	48.438	47.961	−0.477
Invgrade	0.308	0.212	−0.096***	0.190	0.245	0.056***
Panel B. Loan spread by Top10LLTIO and credit ratings						
	Investment grade			Non-investment grade		
	Top10LLTIO		Difference	*Top10LLTIO*		Difference
Variables	High(≥5%)	Low(<5%)	(Low–high)	High (≥5%)	Low(<5%)	(Low–high)
Spread	67.575	84.173	16.599***	196.969	216.757	19.788***
Logspread	3.803	4.061	0.259***	5.071	5.203	0.131***

Notes: Panel A reports results from a univariate comparison of firm and loan characteristics between borrowing firms with high and low *Top10LLTIO* and *Top10LSTIO* sub-samples. High *Top10LLTIO* (*Top10LSTIO*) is a sample with 5% and above of Top10LLTIO (*Top10LSTIO*) else firm belongs to low *Top10LLTIO* (*Top10LSTIO*) sample.
Panel B reports *spread* and *Logspread* for borrowing firms with high and low *Top10 LLTIO* classified by a 5% threshold and credit ratings.

Relative to those in the *low Top10LSTIO* group, loans in the *high Top10LSTIO* group are obtained by firms with a smaller size, no dividend, higher volatility in operating cash flow, higher percentage of performance pricing, and higher risk as measured by credit ratings, leverage, and modified Altman-Z. The loan spread difference for the two groups with high and low *Top10LSTIO* is marginally significant with a relatively smaller economic magnitude (the difference between high *Top LSTIO* and low *Top LSTIO* is less than four basis points). The results from the univariate test confirm our conjecture that due to their frequent trading and lack of monitoring, *LSTIOs*' informational effect as local institutional investors on the loan pricing is unclear.

Panel B of Table 2 shows the comparison of mean *Spread* and *Logspread* between borrowing firms by their investment-grade status and the level of *Top10LLTIO* using a threshold of 5%, respectively. Whether the borrowing firm has an investment grade or not, the mean differences in *Spread* and *Logspread* associated with high (≥5%) and low (< 5%) *Top10LLTIO* are similar in magnitudes and significant at a better than 99% confidence level. Although the univariate result needs to be verified in a multivariate setting later, it suggests that the level of *Top10LLTIO* is more likely to drive the result regardless of credit ratings.

4 | EMPIRICAL RESULTS

4.1 | The LLTIO effect

Because LIO with sizable stakes represents informed ownership, which can play a credible role in ensuring either due diligence, *ex-post* monitoring or both (see Holmstrom, 1979), the presence of LIOs in a borrowing firm may induce lenders to adjust loan spread. Furthermore, as the geographical location of LIOs is likely exogenous to bank loan contracting terms, our identification strategy is less troubled by endogenous concerns.

As it is difficult to read the private information LIO with a short investment horizon, we focus on the effect of LIO with a long-term investment horizon on syndicated loan pricing. In the estimation of the following multivariate regression, we include both long- and short-term ownership by the top 10 (ranked by holding sizes) shareholders with headquarters located within a 100-mile radius of the borrowing firm's corporate headquarters as well as the control variables specified in Equation (4). We use the logarithm of *Spread* (*Logspread*) as the measure of loan spread, similar to other studies in the banking literature (e.g., Ivashina, 2009), in all regression analyses on price terms in the loan contracts.

To mitigate the endogeneity concern, we include the following FE controls in all regression models: bank FE; location FE (location identified by metropolitan statistical area; MSA FE); time-varying top3 bank FE that controls for time-invariant and time-varying FE at the top three banks, which are captured by the interaction term of year FE and top3 banks, namely, JP Morgan Chase, Bank of America, and Citi Group, FE; time-varying industry FE that control for time-invariant and time-varying FE of the industry to which the borrowing firm belong, which are captured by the interaction term of SIC two-digit industry and year FE. The standard errors are double clustered at borrowing firm and year levels.

$$\begin{aligned} Loanspread = f(&Top10LLTIO, Top10LSTIO, institutionalownership, loancharacteristics,\\ &firmcharacteristics, macro-economicvariables,\\ &MSAFE, industry * yearinteractionFE, bankFE, top3bank * yearinteractionFE). \end{aligned} \tag{4}$$

Table 3 reports our baseline results estimated from Equation (4). Column (1) examines the relation between *Logspread* and overall *IO*. The results in column (1) are consistent with the findings from the previous studies of bank loan pricing. That is, a larger, more profitable firm obtains loan rate discounts, whereas a highly levered, volatile firm with a low credit rating and a loan backed by collateral pays a higher spread. The coefficient estimates on loan purpose and industry are also generally significant. The coefficient estimate on *IO* is insignificant, suggesting general IO is not associated with loan spread.

Column (2) examines the relation between *Logspread* and top 10 overall LIO (*Top10Localown*) with all the controls and *IO*. Although the coefficient estimate on *IO* stays insignificant with a similar magnitude as that in column (1), the estimate for *Top10Localown* is negative (−0.119 in magnitude) and significant at 10% level, suggesting that the

TABLE 3 Loan spread and institutional ownership (IO)

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*	(4) *Logspread*	(5) *Logspread*	(6) *Logspread*	(7) *Logspread*
IO	0.032	0.031	0.030	0.032	0.030	−0.009	−0.031
	(0.812)	(0.766)	(0.760)	(0.796)	(0.749)	(−0.199)	(−0.630)
Top10Localown		−0.119*					
		(−1.993)					
Top10LLTIO			−0.163**		−0.158**		
			(−2.747)		(−2.558)		
Top10LSTIO				0.149	0.121		
				(1.526)	(1.183)		
Top10LTIO						0.114**	
						(2.142)	
Top10NLLTIO							0.170***
							(3.222)
LogTA	−0.085***	−0.085***	−0.085***	−0.085***	−0.085***	−0.085***	−0.084***
	(−7.676)	(−7.701)	(−7.653)	(−7.642)	(−7.629)	(−7.667)	(−7.654)
Leverage	0.382***	0.381***	0.382***	0.382***	0.382***	0.383***	0.383***
	(10.769)	(10.854)	(10.804)	(10.735)	(10.773)	(10.719)	(10.778)
Tobin's Q	−0.114***	−0.114***	−0.114***	−0.114***	−0.114***	−0.112***	−0.112***
	(−14.258)	(−14.639)	(−14.637)	(−14.212)	(−14.589)	(−13.744)	(−13.767)
ROA	−0.573***	−0.569***	−0.570***	−0.575***	−0.572***	−0.568***	−0.562***
	(−5.853)	(−5.869)	(−5.859)	(−5.879)	(−5.885)	(−5.735)	(−5.698)
Div Dummy	−0.056***	−0.056***	−0.056***	−0.055***	−0.055***	−0.057***	−0.058***
	(−4.784)	(−4.829)	(−4.742)	(−4.647)	(−4.625)	(−4.876)	(−4.907)
NFA/TA	−0.093*	−0.095*	−0.095*	−0.094*	−0.096*	−0.093*	−0.096*
	(−1.905)	(−1.916)	(−1.937)	(−1.925)	(−1.953)	(−1.911)	(−1.945)
STD CF	0.631***	0.627***	0.620***	0.625***	0.616***	0.634***	0.625***
	(5.821)	(5.828)	(5.786)	(5.810)	(5.780)	(5.811)	(5.743)
Modified Z	−0.037***	−0.037***	−0.037***	−0.037***	−0.037***	−0.038***	−0.038***
	(−5.744)	(−5.813)	(−5.663)	(−5.642)	(−5.591)	(−5.886)	(−5.932)
Invgrade	−0.444***	−0.445***	−0.445***	−0.443***	−0.444***	−0.446***	−0.448***
	(−14.822)	(−14.765)	(−14.687)	(−14.983)	(−14.848)	(−14.849)	(−14.740)
Rated	0.129***	0.130***	0.129***	0.128***	0.128***	0.130***	0.131***
	(5.551)	(5.568)	(5.567)	(5.563)	(5.579)	(5.581)	(5.618)
Log(Loan amount)	−0.063***	−0.063***	−0.063***	−0.063***	−0.063***	−0.063***	−0.063***
	(−8.235)	(−8.237)	(−8.290)	(−8.194)	(−8.251)	(−8.211)	(−8.312)
Number of lenders	−0.000	−0.000	−0.000	0.000	−0.000	0.000	−0.000
	(−0.001)	(−0.023)	(−0.032)	(0.004)	(−0.027)	(0.016)	(−0.007)

(Continues)

TABLE 3 (Continued)

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*	(4) *Logspread*	(5) *Logspread*	(6) *Logspread*	(7) *Logspread*
Performance pricing	−0.062***	−0.062***	−0.062***	−0.062***	−0.062***	−0.062***	−0.063***
	(−3.408)	(−3.420)	(−3.432)	(−3.429)	(−3.449)	(−3.428)	(−3.456)
Maturity	−0.001***	−0.001**	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(−3.036)	(−2.770)	(−3.153)	(−3.258)	(−3.212)	(−3.123)	(−3.133)
Secured loan	0.385***	0.385***	0.384***	0.385***	0.384***	0.385***	0.384***
	(11.312)	(11.441)	(11.464)	(11.255)	(11.410)	(11.287)	(11.415)
Missing Secured	0.073***	0.073***	0.073***	0.073***	0.072***	0.073***	0.073***
	(3.332)	(3.337)	(3.314)	(3.308)	(3.295)	(3.340)	(3.324)
Relation dummy	0.017	0.017	0.017	0.017	0.017	0.017	0.017
	(1.431)	(1.436)	(1.441)	(1.408)	(1.412)	(1.402)	(1.401)
Term spread	−0.377***	−0.377***	−0.377***	−0.377***	−0.377***	−0.376***	−0.376***
	(−11.270)	(−11.210)	(−11.187)	(−11.270)	(−11.191)	(−11.258)	(−11.190)
Credit spread	−0.222***	−0.221***	−0.221***	−0.222***	−0.221***	−0.222***	−0.221***
	(−15.079)	(−15.054)	(−15.078)	(−15.051)	(−15.034)	(−15.144)	(−15.168)
Loan type controlled	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan purpose controlled	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MSA fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Two-way clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,474	16,474	16,474	16,474	16,474	16,474	16,474
R^2	0.753	0.753	0.753	0.753	0.753	0.753	0.753
Adjusted R^2	0.728	0.728	0.728	0.728	0.728	0.728	0.728

Notes: This table reports the coefficient estimates and standard errors from the estimation of the following model (Equation 4): *Loan spread = f (Top10LLTIO, Top10LSTIO, IO, loan characteristics, firm characteristics, macro-economic variables, metropolitan statistical area (MSA) fixed effects (FE), industry* year interaction FE, bank FE, top3bank*year interaction FE)*, which examines the relation between loan spread and local IO (LIO) after controlling for IO in general, firm characteristics, loan characteristics, macroeconomic variables, location (MSA) FE, bank FE, as well as time-varying industry and top3 bank FE from 1995–2009. The dependent variable is *Logspread* for all models. An institutional owner is defined as "local" if the headquarters of the institution is within a 100-mile radius of the company's headquarters. Annual Compustat data are matched to Thomson Reuters DealScan data using the identifiers of Chava and Roberts (2008). We exclude securities with share codes different from 10 or 11, financial and utilities companies, borrowers incorporated or headquartered outside of the United States, loans originated outside of the United States, loans denominated in foreign currencies, loans with benchmark rates other than the LIBOR, and observations with missing data. Industry is proxied by SIC two-digit levels. Bank FE are captured by dummies for each different lender. Time-varying top3 bank FE are captured by multiplying year FE three dummies that are set to 1 if the lender belongs to top3 banks that issue most loans according to Ross (2010): JP Morgan Chase, Bank of America, and Citi Group. Robust standard errors are two-way clustered at the borrowing firm and year levels. The list of variable definitions and measurements is shown in the Appendix.

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

aggregated informed equity IO (including that with both short- and long-term investment horizon) is negatively associated with loan spreads.

We next include the top 10 local ownership with a short-term (*Top10LSTIO*) and a long-term (*Top10LLTIO*) investment horizon separately to have a better understanding of the negative effect of *Top10Localown* on loan spread. In column (3), where we include *IO* and *Top10LLTIO*, the coefficient estimate on *Top10LLTIO* is negative and significant at 5% level with a larger magnitude (−0.163). In column (4), where we include *IO* and *Top10LSTIO*, the coefficient estimate on *Top10LSTIO* is positive yet insignificant at 10% level (0.149). In column (5), we include *IO*, *Top10LSTIO*, and *Top10LLTIO* in the same regression and find a drastic difference in the relation between *Top10Localown* with long- and short-investment horizons: The coefficient estimate on *Top10LLTIO* is negative (−0.158), significant at 5% level, while that on *Top10LSTIO* is positive (0.121) and statistically insignificant. Results in columns (3)–(5), therefore, point to a differential effect of *Top10Localown* on loan spread due to different investment horizons. The negative effect of *Top10LLTIO* on loan spread is likely to originate from the long-term monitoring role of this informed IO that reduces information asymmetry by alleviating lenders' concern for moral hazard problems.

In columns (6)–(7), we also explore whether investment horizon alone drives the lower loan spread by including long-term overall IO and non-LLTIO with other controls in the regressions. Interestingly, while *IO* remains insignificant, both Top10 long-term and top 10 non-local long-term ownership have a positive and significant effect on loan spreads, which is opposite of the *Top10LLTIO* effect. This suggests that long investment horizon and local ownership together, which are conducive to informed long-term intuitional ownership, drive the LLTIO effect. Our results support H1.

4.2 | Magnitude of LLTIO effect propensity score matching (PSM) analysis

At a first look, the magnitude of LLTIO effect does not appear large based on estimation results from Table 3: One standard deviation of change in *Top10LLTIO* leads to 0.025 standard deviation of change in *Logspread*. However, since the variable *Top10LLTIO* has a highly skewed distribution with zero minimum, mean and median and 74.5% maximum, it is difficult to interpret the average economic significance using the normal method. We compare the average loan spread at firms that have high and low ownership by the Top10LLTIOs but are similar otherwise using the PSM analysis. PSM analysis not only provides us with an estimate of the magnitude of the LLTIO effect but ensures that the LLTIO effect that we document is not driven by firm or loan characteristics. We match loans using borrowing firm characteristics and loan characteristics based on propensity matching scores, and then compare the loan spreads based only on one variable for the matched samples–whether *Top10LLTIO* is 5% or higher (*high Top10LLTIO*) or not (*low Top10LLTIO*).

We conduct propensity matching using a logit model with the following borrowing firm characteristics: Loan amount, performance pricing, overall IO, stake held by the 10 largest institutional owners, firm size, leverage usage, Tobin's Q, R&D-to-asset ratio, ROA, dividend dummy, asset tangibility, and cash flow volatility. The model also incorporates the following loan characteristics: Previous banking relationship with a lead bank, loan originated by one of the top-three banks in loan syndication, secured loan dummy, short-term revolver dummy, long-term revolver dummy, term loan dummy, other loan dummies, loan maturity, investment-grade dummy, term spread, credit spread, various dummies for loan purposes, and Fama–French 12-industry categorization. Based on the closeness of their propensity scores, we select the nearest syndicated loan-firm observation with similar (matched) characteristics and compare mean *spread* and *Logspread* based on one variable—whether the level of *Top10LLTIO* is above 5% or not. We then conduct the same exercise choosing from the three nearest syndicated loan-firm observations and compare the difference in *Spread* and *Logspread* with respect to *Top10LLTIO*. The propensity matching results reported in Table 4 show that we are able to match a group of firms than resemble one another within an allowed error margin (caliper) of 0.1. The *spread* for the *high Top10LLTIO* (*Top10LLTIO* $\geq$5%) group is 7.485 basis points lower than that for the *low Top10LLTO* (*Top10LLTIO*<5%) group before matching. After the match, the average magnitude of the LLTIO effect is also about 7–8 basis points for firms in *high Top10LLTIO* and *low Top10LLTO* groups, based on the estimation of *Logspread* for an average firm in our sample with loan spread at about 162 basis points. The results indicate that the LLTIO effect is

TABLE 4 Propensity score matching analysis

	Difference	Caliper 0.1and NN1	Caliper 0.1and NN3
Spread	After matching	−7.485***	−6.885***
	(High 5% vs. Low Top10LLTIO)	(−3.65)	(−3.69)
Logspread	After matching	−0.056***	−0.052***
	(High 5% vs. Low Top10LLTIO)	(−4.28)	(−4.74)

Notes: This table reports results from a two-stage propensity score match. In the first stage, we use a logit model to estimate propensity scores for each loan observation. We match loan observations that differ in the level of *Top10LLTIO*, with high *Top10LLTIO* (5% and above) and low *Top10LLTIO* (below 5%), respectively, and which are similar in size, Tobin's Q, R&D intensity, dividend-paying or not, return on assets (ROA), asset tangibility, cash flow volatility, IO, loan amount, performance pricing, secured loan status, type of loan, maturity, investment grade or not, term spread, credit spread, loan purposes, and loan-originating year. The matched borrowing firms are also in the same Fama–French 48 industries. We report results from the matches using the nearest one observation and the nearest three observations, which is based on the distance of their propensity scores as well as requiring the error margin (caliper) to be less than 0.1, respectively. NN1 refers to the nearest one neighbor and NN3 refers to the nearest three neighbors in conducting the matches. An institutional owner is defined as "local" if the headquarters of the institution is within a 100-mile radius of the company's headquarters. Annual Compustat data are matched to Thomson Reuters DealScan data according to Chava and Roberts (2008). We exclude securities with share codes different from 10 or 11, financial and utilities companies, borrowers incorporated or headquartered outside of the United States, loans originated outside of the United States, loans denominated in foreign currencies, loans with benchmark rates other than the LIBOR, and observations with missing data. Robust standard errors are used and *z*-statistic in in the bracket. The list of variable definitions and measurements is shown in the Appendix.

economically significant and is not driven by firm or loan characteristics that have been documented in the literature to influence loan spreads.

4.3 | The monitoring-driven LLTIO effect

To test our hypothesis that monitoring by Top10LLTIO drives the LLTIO effect, we next investigate the firm-level mechanisms through which creditors benefit from Top10LLTIO's monitoring role using the following equation:

$$Firm-levelMonitoringMechanism = f(Top10LLTIO, Top10LSTIO, institutionalownership, firmcharacteristics, industryFE, yearFE). \quad (5)$$

4.3.1 | Monitoring that benefits creditors

Covenants are terms used in a loan contract to protect creditors from exploitation by shareholders. Violating covenants leads to much more expensive and restrictive future loan terms and fewer investments (Nini et al., 2009; Roberts & Sufi, 2009) and is seen as a strong negative signal of the firm's credibility. Top10LLTIO's monitoring role should benefit creditors if it leads to fewer covenant violation by the borrower. We estimate a logit regression using the data on covenant violation from 1996 to 2008[7] and report the results in columns (1) and (2) of Table 5. The relation between Top10LLTIO and covenant violation in two and three years after the loan is issued is negative and significant, suggesting that one channel for the LLTIOs' monitoring role is reducing borrower's costly contract violations. We also observe that no other types of IO, including *IO* and *Top10LSTIO*, have consistent negative relation with covenant violation.

[7] We thank Professor Sufi for posting the covenant violation data on his website at: https://faculty.chicagobooth.edu/amir.sufi/chronology.html

TABLE 5 The LLTIO's monitoring role: Influence on lucky CEO and E-Index

VARIABLES	(1) *Covenant violation (after2year)* (Logit)	(2) *Covenant violation (after3year)* (Logit)	(3) *Lucky CEO* (Logit)	(4) *E-index* (OLS)	(5) *G-index* (OLS)
Lucky director			3.759***		
			(13.329)		
IO	−0.357	−0.487**	1.262***	0.423**	1.270**
	(−1.619)	(−1.992)	(3.600)	(2.436)	(2.690)
Top10 LLTIO	−0.617**	−0.503*	−1.775*	−0.501**	−0.092
	(−1.969)	(−1.845)	(−1.936)	(−2.336)	(−0.198)
Top10 LSTIO	0.826	0.010	0.813	0.103	−1.731
	(1.363)	(0.013)	(0.449)	(0.203)	(−1.337)
LogTA	−0.350***	−0.336***	−0.153**	−0.042	0.117*
	(−7.538)	(−6.943)	(−2.279)	(−1.732)	(2.000)
Leverage	0.551**	0.827**	−0.548	0.224	0.035
	(2.178)	(2.351)	(−1.018)	(1.035)	(0.088)
Tobin's Q	−0.186***	−0.081	0.147	−0.049*	−0.165*
	(−2.754)	(−0.977)	(0.988)	(−1.823)	(−2.124)
ROA	−0.673*	−0.475	−2.325	−0.277	−0.088
	(−1.680)	(−0.868)	(−1.636)	(−0.864)	(−0.108)
R&D/TA	−1.368	−2.174	4.895	−0.154	−0.505
	(−0.952)	(−1.556)	(0.830)	(−0.174)	(−0.233)
Div dummy	−0.194	−0.051	−0.509	0.289***	1.117***
	(−1.356)	(−0.797)	(−1.442)	(4.602)	(7.540)
NFA/TA	0.192	0.161	0.237	0.335	0.478
	(0.817)	(0.804)	(0.241)	(1.462)	(0.871)
STD CF	1.681*	0.385	−3.488**	−1.115	−3.672**
	(1.838)	(0.366)	(−2.034)	(−1.603)	(−2.800)
Post SOX (92-2001 vs. 2002–2009)	−0.662***	−0.629***	0.082		
	(−20.008)	(−15.967)	(0.147)		
Industry fixed	Yes	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes	Yes
Observations	10,393	8612	1350	8039	8039
R_2				0.189	0.221
Pseudo R^2	0.124	0.118	0.334		
Adjusted R^2				0.122	0.156

Notes: This table examines *Top10 LLTIO's* monitoring role and reports coefficient estimates and standard errors from the regression model (Equation 5):*Firm-level Monitoring Mechanism = f (Top10LLTIO, Top10LSTIO, IO, firm characteristics, industry FE, year FE)*.

(Continues)

TABLE 5 (Continued)

The dependent variable of columns (1) and (2) is covenant violation two and three years after loan is issued, respectively. *Covenant violation* is a dummy that takes the value 1 when covenant is violated in a given year and 0 otherwise. The dependent variable of column (3) is lucky of CEO of Bebchuk et al. (2010). *Lucky CEO* takes the value 1 when options are granted to the CEO at the lowest stock price of the month and 0 otherwise. The dependent variables of columns (4) and (5) are *E-index* of Bebchuk et al. (2009) and *G-index* of Gompers et al. (2003), respectively. Robust standard errors are two-way clustered at the firm and year levels. All the regressions include year and industry (defined as SIC two-digit level) FE. The list of variable definitions and measurements is shown in the Appendix. Data is from https://www.law.harvard.edu/faculty/bebchuk/data.shtml. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Lucky option grants are defined as options granted at the lowest stock price of the month. Bebchuk et al. (2010) show that the opportunistic timing of option grants reflects internal governance weakness and that lucky option grants to CEOs and directors suggest weak monitoring. As banks view internal governance and monitoring as a factor that contributes to their cost-benefit analysis in granting a loan (Ge et al., 2012) and as a number of empirical evidences suggest that geographic proximity of the institutional investors is associated with improved corporate governance, which benefits creditors through reduced shareholder-manager agency cost (Chhaochharia et al., 2012), we suggest that Top10LLTIO could benefit creditors through improved internal governance. We use "lucky" option grants to CEOs and directors as our proxy for internal governance weakness and expect to observe a negative relation between the likelihood of lucky CEO option grant and Top10LLTIO. We run a logit regression with clustered standard errors using the data on lucky CEO option granting[8] from 1996 to 2005 and find that this is indeed the case. The results are displayed in column (3) of Table 5. The dependent variable is a dummy variable indicating whether a CEO grant event was lucky and *Top10LLTIO* is the independent variable of interest. We control for *Lucky director*, which is a dummy variable indicating whether an independent director grant event was lucky, and other variables like *IO*, *Top10LSTIO*, as well as a number of firm characteristics, including firm size, leverage, profitability, R&D, and so forth. The coefficient estimate on *Top10LLTIO* is negative and significant at the 10% level, consistent with our conjecture that the LLTIOs reduce the likelihood of a lucky CEO grant. The results again suggest that LLTIOs do monitor.

Bebchuk et al. (2009) show that the E-index, which is based on six out of the24 provisions that are included in the G-index (Gompers, Ishii, & Metrick, 2003), is monotonically associated with an economically significant reduction in firm value. We use E-index as another proxy for poor governance practice and expect to observe a negative relation between Top10LLTIO and the level of E-index. We run two pooled regressions, with *E-index* and *G-index*[9] as the dependent variable, respectively, and with *Top10LLTIO* as the independent variable of interest. The coefficient estimates of *Top10LLTIO* are negative and significant at 5% level, when the dependent variable is *E-index* as shown in column (4) of Table 6. The coefficient estimate of *Top10LLTIO* is insignificant as shown in column (5) of Table 6, where the dependent variable is *G-index*. Overall, these results suggest that Top10LLTIO's monitor benefit creditors through improved corporate governance.

4.3.2 | Interaction between the LLTIO and other monitoring mechanisms

If the observed LLTIO effect is the result of long-term monitoring due to geographic proximity, it may lose its significance when (1) the lead bank is close to the borrowing firm, (2) when the borrowing firm has an urban location, and (3) when the loan is secured because (1) the LLTIOs do not exhibit any advantage with respect to long-term monitoring compared to a lead bank that is also geographically proximate, (2) a borrowing firm located in an urban location is subject to greater scrutiny and is better governed, as managerial investment decisions are easily observable

[8] We thank Professor Bebchuk for providing the data on his website at https://www.law.harvard.edu/faculty/bebchuk/data.shtml.

[9] *E-index* and *G-index* are constructed following Bebchuk et al. (2009) and Gompers et al. (2003), respectively. We thank Professor Bebchuk for providing the *E-index* on his website at: https://www.law.harvard.edu/faculty/bebchuk/data.shtml.

TABLE 6 Interaction between the LLTIO and other monitoring mechanisms

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*
IO	0.090	0.034	0.035
	(1.426)	(0.758)	(0.773)
Top10 LLTIO	−0.175**	−0.196***	−0.197***
	(−2.556)	(−3.418)	(−3.065)
Close bank	−0.124**		
	(−2.208)		
*Close bank * Top10 LLTIO*	0.013		
	(0.087)		
Urban10		−0.029*	
		(−1.880)	
*Urban10 * Top10 LLTIO*		0.129*	
		(1.747)	
Secured loan			0.380***
			(10.270)
*Secured loan * Top10 LLTIO*			0.098
			(1.130)
Top10 LSTIO	0.134	0.190***	0.176**
	(1.123)	(3.232)	(2.843)
Loan purpose	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes
Loan variables control	Yes	Yes	Yes
Financial variables control	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes
Two-way clustered	Yes	Yes	Yes
Top10 LLTIO + Close bank Top10 LLTIO = 0*	$F = 1.26$ ($p = 0.279$)		
*Top10 LLTIO + Urban10 * Top10 LLTIO = 0*		$F = 1.14$ ($p = 0.301$)	
*Top10 LLTIO + Secured loan * Top10 LLTIO = 0*			$F = 2.56$ ($p = 0.129$)
Observations	6664	16,658	16,658
R^2	0.770	0.741	0.741
Adjusted R^2	0.739	0.720	0.720

Notes: This table examines other monitoring factors (*Close bank*, *Urban10*, *and Secured loan*) that influence the relation between natural logarithm of loan spread and *Top10LLTIO*. The dependent variable is *Logspread* for all models. An institutional owner is defined as "local" if the headquarters of the institution is within a 100-mile radius of the company's headquarters. Annual Compustat data are matched to Thomson Reuters DealScan data according to Chava and Roberts (2008). We exclude securities with share codes different from 10 or 11, financial and utilities companies, borrowers incorporated or headquartered outside of the United States, loans originated outside of the United States, loans denominated in foreign currencies, loans with benchmark rates other than the LIBOR, and observations with missing data. Time-varying top3 bank FE are captured by multiplying.

(Continues)

TABLE 6 (Continued)

year FE by three dummies that are set to 1 if the lender belongs to top3 banks that issue most loans according to Ross (2010): JP Morgan Chase, Bank of America, and Citi Group. Robust standard errors are two-way clustered at the borrowing firm and year levels. The list of variable definitions and measurements is shown in the Appendix.
***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

(John et al., 2011), and (3) secured loans have reduced long-term monitoring needs. In summary, because the benefits from Top10LLTIO's monitoring should be less, we expect less salient LLTIO effect in these situations.

To examine these three conditions, we create three indicator variables, *Close Bank*, *Urban10* and *Secured loan*, which takes a value of 1 if the headquarters of the lead bank that issued the loan is within a 100-mile radius of the borrowing firm's corporate headquarters, if the borrowing firm is located in one of the 10 largest MSA in the United States, and if the loan is secured with collateral, respectively, and 0 otherwise. We then interact *Top10LLTIO* with *Close Bank*, *Urban10*, and *Secured loan* and examine the LLTIO effect for loans (1) with a geographically proximate lead bank, (2) a borrower that is located in one of the 10 largest MSAs by testing whether the respective sum of coefficient estimates, namely, (*Top10LLTIO* + *Close Bank* × *Top10LLTIO*), (*Top10LLTIO* + *Urban10*×*Top10LLTIO*), and (*Top10LLTIO*+*SecuredLoan*×*Top10LLTIO*) is statistically different from 0. We report the results in columns (1)–(3) in Table 6. The coefficient estimates on *Top10LLTIO* are negative and significant at a better than 5% level in both columns, suggesting that the LLTIO effect is salient when the lead bank is not geographically close to the borrowing firm and when the borrowing firm is not located in an urban area. The coefficient sums, (*Top10LLTIO* + *Close Bank* × *Top10LLTIO*), (*Top10LLTIO* + *Urban10* × *Top10LLTIO*), and (*Top10LLTIO*+*Secured loan*×*Top10LLTIO*) are all insignificantly different from 0 (partial *F*-statistics of 1.26, 1.14, and 2.56, respectively), suggesting that the LLTIO effect vanishes when the loan is issued by a lead bank located close to the borrowing firm, or when the borrowing firm is located in a large urban area, or when the loan is secured. These findings support H1a.

4.4 | Conflicts of interest and the LLTIO effect

As LLTIO is a type of equity ownership and associated with the concern over agency cost of debt, we expect the LLTIO effect to vary with the likelihood of conflicts of interest between creditors and shareholders. Conflicts of interest arise when the probability of default increases. Myers (2001, p. 96) states: "If debt is totally free of default risk, debtholders have no interest in the income, value or risk of the firm. But if there is a chance of default, then shareholders can gain at the expense of debt investors. Equity is a residual claim, so shareholders gain when the value of existing debt falls, even when the value of the firm is constant." To explore how the LLTIO effect varies with the likelihood of a conflict of interest, which is driven largely by default risk, we employ five proxies for default risk: Whether the borrowing firm has an investment-grade rating on its long-term debt, the level of default risk measured by Altman-Z and modified Altman-Z score, and whether the loan is syndicated during a crisis, and the firm's debt-to-equity ratio. As the default risk is lower for investment-grade borrowing firms than for their non-investment-grade counterparts, lower for firms with higher Altman-Z, and lower during non-crisis periods, and lower for firms with lower debt-to-equity ratio, we expect a stronger LLTIO effect as conflicts of interest between equity and debt holders are less likely with lower default risk, and therefore, lenders are more likely to have net benefits from long-term informed equity ownership.

The results constructed using the five foregoing proxies are reported in Table 7. Columns (1) and (2) examine how the level of Altman-Z and modified Altman-Z scores influence the LLTIO effects. Altman-Z and modified Altman-Z scores describe a firm's probability of financial distress and low scores suggest a high probability of financial stress. Dummy variable *Low Altman-Z* takes on value 1 if *Altman-Z* is less than 1.81 and 0 otherwise. Dummy variable *Low Modified Z* takes on value 1 if *Modified Z* is less than 1 and 0 otherwise. The coefficient estimates on the interaction terms (*Top10LLTIO*× *Low Altman-Z* and *Top10LLTIO*×*Low Modified Z)* are positive and significant, offsetting the negative LLTIO effect. This suggests that the Top10LLTIO effect disappears when conflicts of interest between equity and

TABLE 7 Conflicts of interest between shareholders and creditors

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*	(4) *Logspread*	(5) *Logspread*	(6) *Logspread*
IO	0.040	0.040	0.037	0.115*	0.083*	0.083
	(0.876)	(0.883)	(0.807)	(1.764)	(1.879)	(1.550)
Top10 LLTIO	−0.184***	−0.195***	−0.207***	−0.260*	−0.195***	−0.450***
	(−3.329)	(−3.841)	(−4.917)	(−2.117)	(−3.854)	(−3.583)
Low Altman-Z	0.065***					
	(3.262)					
*Top10 LLTIO * Low Altman-Z*	0.161*					
	(1.890)					
Low Modified Z		0.061***				
		(3.524)				
*Top10 LLTIO * Low Modified Z*		0.177*				
		(1.763)				
*Top10LLTIO * Crisis*			0.214***			
			(2.969)			
Noninvgrade2				0.444***		
				(12.819)		
*Top10LLTIO * Noninvgrade2*				0.204		
				(1.506)		
High D/E					0.193***	
					(13.545)	
*Top10LLTIO * High D/E*					0.131	
					(1.541)	
*Top10 LLTIO *High25*						0.387***
						(3.376)
Top10 LSTIO	0.180***	0.178**	0.184***	0.124	0.207***	0.285***
	(2.956)	(2.878)	(3.103)	(0.897)	(3.517)	(3.805)
Loan purpose	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes	Yes	Yes	Yes
Loan variables control	Yes	Yes	Yes	Yes	Yes	Yes
Financial variables control	Yes	Yes	Yes	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Two-way clustered	Yes	Yes	Yes	Yes	Yes	Yes
Top10LLTIO+Top10LLTIO Noninvgrade2 = 0*				*F* = 0.33 (*p* = 0.573)		
*Top10LLTIO+ Top10LLTI * High D/E = 0*				*F* = 0.69 (*p* = 0.417)		

(Continues)

TABLE 7 (Continued)

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*	(4) *Logspread*	(5) *Logspread*	(6) *Logspread*
Observations	16,658	16,658	16,658	8162	16,658	16,658
R^2	0.743	0.743	0.742	0.807	0.746	0.726
Adjusted R^2	0.721	0.721	0.721	0.782	0.724	0.703

Notes: This table examines how the likelihood of conflicts of interest between shareholders and creditors influence the relation between natural logarithm of loan spread and *Top10LLTIO*. The dependent variable is *Logspread* for all models. *Low Altman-Z* is a dummy that takes the value 1 if Altman-Z is less than 1.81 and 0 otherwise. If *Altman-Z* is less than 1.81, the probability of financial distress is very high. *Low Modified Z* is a dummy that takes the value 1 if *Modified Z* is less than 1 and 0 otherwise. If *Modified Z* is less than 1, the probability of financial distress is very high. *Noninvgrade2* is a dummy that takes the value 1 if a firm's long-term credit rating is below BBB- and 0 otherwise. The non-rated firms are not included in the construction of dummy variable *Noninvgrade2*. *Crisis* is a dummy that takes the value 1 if the year of the observation falls in 2001–2002 or 2007–2009 and 0 otherwise. High D/E is 1 if Debt/Equity ratio is above 1 else 0. *High25* is a dummy that takes the value 1 if the level of Top10LLTIO is above 25%, which is about 90th percentile of the variable and 0 otherwise. Time-varying top three bank FE are captured by multiplying year by three dummies that are set to 1 if the lender belongs to top3 banks that issue most loans according to Ross (2010): JP Morgan Chase, Bank of America, and Citi Group. Robust standard errors are two-way clustered at the borrowing firm and year levels. The list of variable definitions and measurements is shown in the Appendix.
***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

debt holders offset Top10LLTIOs' monitoring benefits. Similarly, results in columns (3) show that the interaction term of *Top10LLTIO*×*Crisis* and are both positive and significant. In column (4), we interact *Top10LLTIO* with *Noninvgrade2*, which is a dummy variable for the firm's credit rating being BBB and above, and in column (5), we interact *Top10LLTIO* with *High D/E*, which is a dummy variable that takes value 1 if the firm's debt-to-equity ratio is above 1. Both interaction terms capture the LLTIO effect at firms with higher default risk and the coefficient estimates for both are positive and insignificant, with the main effect captured by the coefficient estimate of *Top10LLTIO* being negative and significant. The partial *F*-statistics for *Top10LLTIO* + *Top10LLTIO*×*Noninvgrade2* and *Top10LLTIO* + *Top10LLTIO*×*High D/E* are insignificant, indicating the LLTIO effect goes away in firms with high default risk. All these results suggest that the LLTIO effect disappears when conflicts of interest become non-trivial, either during crisis[10] or when the firm has a non-investment grade credit rating.

The likelihood of conflicts of interest between creditors and shareholders also changes with ownership structure (Jensen & Meckling, 1976). As the percentage of equity ownership increases beyond certain points, the trade-off between monitoring benefits and agency cost of a dominant equity owner shifts, leading to a non-linear relation between equity ownership and cost of debt (Anderson et al., 2003; Shleifer & Vishny, 1997). For example, the dominant equity ownership can empower these owners to expropriate wealth from the firm's other constituents, including creditors. McConnell and Servaes (1990) also document a non-linear relation between ownership structure and firm performance. To capture this non-linearity, we include a dummy variable *High25*, which takes a value of 1 if Top10LLTIO is above 25% in absolute percentage (about the 90-percentile level in the distribution of variable *Top10LLTIO*) and 0 otherwise. When Top10LLTIO constitutes a dominant equity ownership, we expect the creditors to be concerned about their higher agency cost of debt despite the benefits from their long-term monitoring role. The results in column 6 confirm the non-linear relation between *Logspread* and *Top10LLTIO*: While the LLTIO effect remains for smaller percentages of Top10LLTIOs, the coefficient on the interaction term *Top10LLTIO***High25* is positive and significant at 1% level, suggesting an un-ignorable agency cost of debt when Top10LLTIO becomes a dominant equity holder. When we include squared Top10LLTIO term instead of *Top10LLTIO***High25*, we find similar non-linear relation between *Logspread* and *Top10LLTIO*.

[10] Crisis periods are defined as 2001–2002 and 2007–2009.

In summary, our findings support H2 that when conflicts of interest between creditors and shareholders are higher, the LLTIO effect is less salient.

4.5 | The LLTIO effect and non-price loan terms

We next explore the effect of LLTIO on non-pricing terms of syndicated loans, including covenants, collateral, maturity of the loan, and fees charged. We use regression Equation (6) below, which is similar to Equation (4) but for non-price loan terms:

$$\begin{aligned} LoanNon-priceTerms = f(&Top10LLTIO, Top10LSTIO,\\ &institutionalownership, loancharacteristics, firmcharacteristics, macro-economicvariables,\\ &MSAFE, industry * yearinteractionFE, bankFE,\\ &top3bank * yearinteractionFE). \end{aligned} \tag{6}$$

These non-price terms are important components of the total cost of the syndicated loan as they either restrict corporate policy or demand extra resources (Jensen & Meckling, 1976; Smith & Warner, 1979). Loan covenant and collateral mitigate information asymmetry (Garleanu & Zwiebel, 2009; Sufi, 2007) in lending syndicates. The fees are also informative of borrowers by reflecting their intentions to exercise options to drawdown for credit lines and cancellation options in term loans (Berg et al., 2016). Following Garleanu and Zwiebel (2009) argument, we expect LLTIO to be associated with less restrictive covenants and pledging collateral. We also examine whether LLTIO influences loan maturity and fees charged. After controlling for firm, loan, bank, location FE and time-varying industry, and top3 bank FE, we estimate the relation between these non-pricing loan terms and *Top10LLTIO* and report the results in Table 8.[11]

In column (1), the dependent variable is *Covindex*, which is the count of covenants included in the syndicated loan. Besides all the control variables we have included for Equation (4), we include a variable that reflects the effect of LLTIO on loans with short maturity, *Top10LLTIO*Short Maturity*. We expect the LLTIO to have little, if any, effect on loans with short-term maturity, where *Short Maturity* is a dummy that takes a value of 1 if the maturity is in the bottom tercile of all syndicated loans for our sample.[12] The coefficient estimate on *Top10LLTIO* is negative and significant, suggesting that syndicate lenders allow the prospective borrowers to have fewer covenants with the presence of Top10LLTIOs. The coefficient on *Top10LLTIO*Short Maturity*, however, is insignificant, confirming our expectation that Top10LLTIOs do not influence the covenant intensity for short-term loans. This is again consistent with long-term monitoring being the explanation for the LLTIO effect.

In column (2), the dependent variable is *Secured loan2*, which is a dummy variable that takes a value of 1 if the loan is secured with collateral and 0 if the loan is not secured. There is a negative and highly significant relation between *Top10LLTIO* and *Secured loan2*, while the effect of *Top10LLTIO*Short Maturity* is positive and significant. This suggests that the existence of Top10LLTIOs reduces the requirement on collateral beyond general IO–the variable *IO* is negatively significant. But such effect does not show for loans with short maturities. In column (3), the dependent variable is *Secured Loan*, which is a dummy variable that is similar to *Secured Loan 2*, with the only difference being that *SecuredLoan* takes a value of 0 if the loan is either unsecured or contains missing information. The results in column (3) are similar to those from column (2). In regression results reported in columns (4)–(6) where the dependent variables are maturity,

[11] The estimation in columns (2) and (3) for *SecuredLoan* dummy variable is logistic and hence is a non-linear regression. With inclusion of firm, loan, bank, and MSA FE and double clustering of standard errors, STATA produces output only when we require one-way clustering of standard errors. So, results in columns (1), (4) and (5) have double-clustered standard errors while those in columns (2) and (3) have one-way clustering of standard errors at the firm level. This is likely due to lack of degrees of freedom with too many estimation restrictions.

[12] For our sample of loan facilities, the bottom tercile of maturity is 36 months and shorter.

TABLE 8 The LLTIO effect on non-price terms

VARIABLES	(1) *Covindex*	(2) *Secured loan2*	(3) *Secured loan*	(4) *Maturity*	(5) *Upfront fee*	(6) *Annual fee*
IO	0.080	−0.350	−0.152	5.492***	−3.230	1.345*
	(0.963)	(−1.510)	(−0.987)	(5.540)	(−1.733)	(2.066)
Top10 LLTIO	−0.248*	−1.318***	−0.922***	−3.134	−7.609*	−0.073
	(−1.846)	(−3.001)	(−2.860)	(−0.014)	(−2.065)	(−0.097)
*Top10 LLTIO * Short*	0.388	1.519***	1.199***		0.844	2.126
Maturity	(1.132)	(2.802)	(3.074)		(0.283)	(1.175)
Top10 LSTIO	0.245	1.911**	0.324	1.001	−3.894	0.399
	(0.851)	(2.542)	(0.606)	(0.001)	(−0.511)	(0.219)
Loan purpose	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes	Yes	Yes	Yes
Loan variables control	Yes	Yes	Yes	Yes	Yes	Yes
Financial variables control	Yes	Yes	Yes	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Two-way clustered SE	Yes	One-way	One-way	Yes	Yes	Yes
MSA fixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,805	10,261	15,570	16,474	16,474	16,474
R^2	0.546	10,261	15,570	0.587	0.204	0.213
Adjusted R^2	0.486			0.544	0.124	0.134
Pseudo R^2		0.472	0.376			

Notes: This table reports coefficient estimates and standard errors from Equation (6), which examines the relation between non-price terms and Top10LLTIO.*Loan Non-price Terms = f (Top10LLTIO, Top10LSTIO, IO, loan characteristics, firm characteristics, macro-economic variables, MSA FE, industry* year interaction FE, bank FE, top3bank*year interaction FE).*

The dependent variable is *Covindex*, *Secured loan2*, *Secured loan*, *Maturity*, *Upfront fee*, and *Annual fee*, respectively, for models (1)–(6). *Secured loan2* is a dummy that takes a value of 1 if the loan is secured and 0 otherwise. Missing secured loans are not included for the construction of variable Secured loan2. Secured loan is a dummy that takes the value 1 if loan is secured and 0 otherwise. Missing secured loans are included for the construction of variable *Secured loan*. *Maturity* is the number of months before the loan matures. *Short maturity* is a dummy that takes a value of 1 if the loan maturity is in the bottom tercile else 0. In our sample, 36 months and shorter maturity loans belong to bottom tercile. *Upfront fee* is the fee paid upon completion of a syndicated loan. *Annual fee* is the amount in BPS (basis points) of a facility commitment amount that a borrower is required to pay on an annual basis regardless of any loan outstanding. Time-varying top3 bank FE are captured by multiplying year FE by three dummies that are set to 1 if the lender belongs to top3 banks that issue most loans according to Ross (2010): JP Morgan Chase, Bank of America, and Citi Group. The industry control for columns (1), (4)–(6) is two-digit SIC code and that for column (2) and (3) is four-digit SIC code. Robust standard errors are two-way clustered at the borrowing firm and year levels for columns (1) and (4)–(6) and one-way clustered at firm level for columns (2) and (3). The list of variable definitions and measurements is shown in the Appendix.

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

upfront fee, and annual fee, respectively, we do not find Top10LLTIO to be influential. Our results on non-price terms are pretty similar to the findings of Deng et al. (2014). These findings support H3.

4.6 | Within-syndicate LLTIO effect

We also investigate whether the LLTIO effect exists within a loan syndicate, as the lead bank in a syndicate essentially serves as a dual agent for the participating banks and the prospective borrowers, and there is thus information asymmetry between the lead and participating banks (Sufi, 2007). As monitoring is not easily observable, lead banks can shirk from their duties, with the other participating banks possibly bearing the full cost of such shirking. To explore whether the presence of LLTIOs at the borrower level alleviates the severity of within-syndicate information asymmetry, we investigate whether the syndicate structure changes with such presence. As Sufi (2007) shows, more severe information asymmetry problems force a lead bank to take a larger stake in a loan. If the LLTIO effect alleviates information asymmetry within the syndicate, we expect a negative relation between *Top10LLTIO* and *LeadShare*, that is, the stake held by the lead bank. In unreported results with *LeadShare* as the dependent variable, and after controlling for firm-, loan-, and macroeconomic characteristics and industry effects, we find LLTIOs to have a negative, albeit non-significant, effect on *LeadShare*. We, therefore, do not find empirical support for the existence of a within-syndicate LLTIO effect.

5 | ADDITIONAL TESTS

5.1 | Simultaneity test: Jointly determined loan terms

While we find that Top10LLTIOs influence both price and non-price terms on syndicated loan contracts, these terms are jointly determined (Melnik & Plaut, 1986). For example, the loan spread, fees, maturity, and collateral are determined simultaneously. Even though it is impractical to model all non-price terms, we estimate the LLTIO effect on price and non-price terms including loan spreads, maturity, and collateral using a system of equations to address the simultaneity concern. In the system of equations, we have three endogenous variables: *Logspread*, *Maturity*, *Secured loan2* for which we assume a unidirectional relationship between the price term and non-price terms and three instruments for them, which are the prevailing default spread, asset maturity, and loan concentration following Bharath et al. (2011). As Bharath et al. (2011) point out, the loan spread is related to the prevailing default spread, which is calculated as the difference in yields between Moody's Baa-rated seasoned corporate bonds and 10-year treasury bonds. The loan maturity should relate to asset maturity if managers try to match debt maturity with the economic life of the assets (Hart & Moore, 1994). The loan concentration, which is the ratio of the loan amount to the existing debt plus loan amount for the borrower, is related to the likelihood of a lender seeking collateral (Berger & Udell, 1990). With the appropriate justification for the instruments, we estimate the following system of equations:

(7a) *Losgspread = f(Top10LLTIO, institutional ownership, loan characteristics, firm characteristics, macroeconomic variables, Maturity, Secured loan2, Default Spread)*

(7b) *Maturity = f(Top10LLTIO, institutional ownership, loan characteristics, firm characteristics, macroeconomic variables, Asset Maturity, Secured loan2)*

(7c) Secured loan2 = f(Top10LLTIO, institutional ownership, loan characteristics, firm characteristics, macroeconomic variables, Maturity, Loan concentration)

While spread and maturity are continuous variables, collateral measured by *Secured loan2* is a discrete-choice variable. To address this issue, we first estimate the reduced form of equations (7a)–(7c) using ordinary least squares (OLS),

OLS, and Probit, respectively, to obtain fitted values for each endogenous variable. We then substitute the fitted values from the first stage for the endogenous variables in Equations (7a)– (7c) and re-estimate Equations (7a)–(7c) following Bharath et al. (2011) and Dennis and Mullineaux (2000). We report the estimation results from the second stage in Table 9 with the fitted values from the first stage with *Pred* as the prefix. We also include a squared term of IO to capture potential non-linearity in the regression. Column (1) reports the second-stage OLS estimates with squared terms for all IO (Top10LLTIO, and Top10LSTIO). The coefficients on Top10LLTIO and its squared are both significant with opposite signs, suggesting a non-linear relation between *Logspread* and *Top10LLTIO*. The coefficients on squared IO and Top10LSTIO terms are insignificant, so we leave it out in other regression equations.

Columns (2)–(4) report estimation results for Equations (7a)—7(c) using the predicted values from the first stage. Consistent with our expectation, the coefficient estimates on *PredSecured2* and *Default spread* are positive and significant. The coefficient estimates on *PredMaturity* and *Asset Maturity* are not significant. We continue to find that the LLTIO effect is negative and highly significant for *Logspread* and *Secured loan2* when we assume simultaneity in loan syndication.

5.2 | IV regressions

Although following the arguments in Gaspar and Massa (2007) and Kang and Kim (2008) render *Top10LLTIO* reasonably exogenous, we adopt an IV approach to try to establish causality between *Top10LLTIO* and *Logspread*. IV regressions can help alleviate the endogeneity concern, which stems from certain unobservable firm characteristics being omitted from the model but is related to both *Logspread* and *Top10LLTIO*. We introduce the two following IVs for *Top10LLTIO*.

(1) *State Top10LDIO*: Annual average of top 10 local dedicated institutional owners[13] with the largest stakes for all other firms in the same state but in different industries to mitigate the industry-clustering effect in some states as defined by their two-digit SIC code.[14]
(2) *Industry Top10LLTIO*: Annual average of top 10 LLTIO with the largest stakes for all other firms within the same industry as defined by their two-digit SIC code.[15]

A valid IV needs to satisfy two conditions: Relevance and exclusion. We expect that whether they belong to dedicated (*Top10LDIO*) or quasi-indexers (*Top10LQIO*), *Top10LLTIO* are likely to be indifferent with their targets if they choose to monitor due to the same reason, that is, lower cost of doing so. Therefore, an institutional investor with monitoring motivation will likely take actions at other firms that are also geographically close. This assumption suggests that our location-based IV, *State Top10LDIO*, satisfies the relevance condition. The exclusion condition requires that *State Top10LDIO* affect loan spread at the borrowing firm only through its information asymmetry alleviation effect and not because of other factors that can influence both *LLTIO* and loan spreads. For example, *State Top10LDIO* focuses on the *Top10LDIO* of other borrowing firms within the same state but in different industries to exclude industry-clustering effect, satisfying the exclusion criterion. Furthermore, in results that are not tabulated here, we find that the LLTIO effect remains negative and significant in a similar regression to Equation (4) after controlling for added state FE of the borrowing firms. When state FE are controlled, we focus on the within-state variation of LLTIO and we still find

[13] Following Bushee (1998), we define dedicated IO as being characterized by large average investments in portfolio firms with extremely low turnover ratios. It is a component of LLTIO.

[14] The IV (*State Top10LDIO*$_i$) for *Top10LLTIO*$_i$ is constructed by including all other firms in the same state but not the same industry as firm *i*, identifying the aggregate *Top10LDIO* level for each, and calculating the annual average *Top10LDIO* across firms in a given year. Similarly, we construct our other IV (*Industry Top10LLIO)* using information on *Top10LLTIO* for all other firms with the same two-digit SIC codes to calculate the annual average.

[15] We similarly construct IVs based on *Top10LLTIO* for firms in other industries in the same state and obtain similar results: *Top10LLTIO* is not endogenous, and the LLTIO effect remains.

TABLE 9 Endogeneity and estimation of simultaneous equations

	(1)	(2)	(3)	(4)
	OLS	OLS	OLS	Probit
VARIABLES	*Logspread*	*Logspread*	*Maturity*	*Secured loan2*
IO	0.709	0.738	5.558***	1.742
	(0.993)	(1.050)	(5.633)	(0.776)
IO_squared	0.024			
	(0.280)			
Top10 LLTIO	−0.459**	−0.467**	3.906	−2.329***
	(−2.121)	(−2.162)	(1.002)	(−3.312)
Top10 LLTIO_squared	0.468**	0.475**	−5.015	2.564***
	(2.251)	(2.293)	(−0.688)	(3.238)
Top10 LSTIO	0.438	0.527	1.503	2.093
	(0.788)	(1.044)	(0.474)	(1.278)
Top10 LSTIO_squared	0.291			
	(0.375)			
LogTA	−0.105	−0.106	−0.482	−0.544*
	(−1.098)	(−1.110)	(−1.507)	(−1.800)
Leverage	1.050	1.056	0.171	3.131
	(1.292)	(1.300)	(0.125)	(1.200)
Tobin's Q	−0.041***	−0.041***	0.676***	−0.144***
	(−4.325)	(−4.363)	(2.681)	(−5.495)
ROA	1.650	1.660	20.713***	3.130
	(0.901)	(0.907)	(7.856)	(0.534)
Div Dummy	0.265	0.266	3.007***	0.309
	(1.265)	(1.270)	(6.043)	(0.463)
NFA/TA	0.089	0.089	4.060**	−0.360
	(0.947)	(0.947)	(2.168)	(−1.194)
STD CF	−0.645	−0.649	−12.385***	−0.252
	(−0.750)	(−0.754)	(−3.087)	(−0.091)
Modified Z	−0.012	−0.012	0.195	−0.087**
	(−1.429)	(−1.438)	(1.036)	(−2.369)
Invgrade	−0.382	−0.385	7.553***	−2.225*
	(−1.028)	(−1.036)	(6.202)	(−1.880)
Rated	0.208	0.210	−1.330*	1.316*
	(0.841)	(0.849)	(−1.844)	(1.653)
Log(Loan amount)	0.252	0.253	3.430***	0.539
	(1.040)	(1.046)	(14.219)	(0.700)
Number of lenders	0.019	0.019	0.139***	0.060
	(0.949)	(0.956)	(4.437)	(0.961)

(Continues)

TABLE 9 (Continued)

VARIABLES	(1) OLS *Logspread*	(2) OLS *Logspread*	(3) OLS *Maturity*	(4) Probit *Secured loan2*
Performance pricing	0.228	0.229	4.499***	0.487
	(0.849)	(0.853)	(9.608)	(0.567)
Relation dummy	−0.113	−0.114	−0.867**	−0.274
	(−1.101)	(−1.107)	(−2.124)	(−0.831)
Term spread	−0.047	−0.047	−0.505	−0.400
	(−0.362)	(−0.367)	(−0.707)	(−0.953)
Credit spread	−0.476	−0.479	−2.444**	−1.277
	(−1.031)	(−1.038)	(−2.307)	(−0.863)
PredMaturity	−0.151	−0.152		−0.359
	(−1.114)	(−1.120)		(−0.829)
PredSecured2	1.506***	1.505***	26.732***	
	(21.671)	(21.791)	(10.594)	
Default spread	0.071**	0.071**		
	(2.393)	(2.408)		
Asset maturity			−0.016	
			(−0.243)	
Loan concentration				−0.256
				(−1.449)
Loan type controlled	Yes	Yes	Yes	Yes
Loan purpose controlled	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
Firm level clustered	Yes	Yes	Yes	Yes
Observations	12,029	12,029	12,029	12,029
R^2	0.642	0.642	0.495	
Adjusted R^2	0.639	0.639	0.490	
Pseudo R^2				0.426

Notes: This table reports coefficient estimates and standard errors from models 7(a)–(c), which involve a simultaneous equation estimation of loan spread and non-price terms in a system of equations. Dependent variable is *Logspread* for models (1) and (2), *Maturity* for model (3), and *Secured loan2* for model (4). *Secured loan2* is a dummy that takes a value of 1 if loan is secured and 0 if loan is not secured. Missing secured loans are not included for the construction of variable *Secured loan2*. Robust standard errors clustered at the borrowing firm level. The list of variable definitions and measurements is shown in the Appendix.
***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
Instrument for *Logspread: Default spread*Instrument for *Maturity: Asset maturity*Instrument for *Secured loan2: Loan concentration*

high LLTIO to be associated with lower *Logspread*. This suggests that location in different states does not have a systematic effect on loan spreads and therefore is not a factor that drives our results. We also include *Industry Top10LLIO* as a second IV so that we can conduct the endogeneity test for *Top10LLTIO*. Hansen's *J*-test confirms that at least one instrument is valid.

TABLE 10 Instrumental variable (IV) regressions for bank loan spread

	(1)	(2)	(3)	(4)
	First stage	*Logspread*	First stage	*Logspread*
VARIABLES	*Top10LLTIO*	Two-stage least squares	*Top10LLTIO*	Generalized method of moments
IO				0.034
				(1.059)
Top10LLTIO (predicted)		−0.269**		−0.277**
		(−2.403)		(−2.488)
Instruments:				
State Top10LDIO	1.512***		1.513***	
	(17.080)		(17.110)	
Industry Top10LLTIO	0.192***		0.192***	
	(1.710)		(2.730)	
Loan purpose	Yes	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes	Yes
Loan variables control	Yes	Yes	Yes	Yes
Financial variables control	Yes	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes	Yes
Clustered at a firm level	Yes	Yes	Yes	Yes
F-test of excluded	150.36***		150.87***	
Instruments (*p*-value)	($p = 0.000$)		($p = 0.000$)	
Endogenous Chi^2 test (*p*-value)		2.176 ($p = 0.140$)		2.229 ($p = 0.135$)
Hansen's *J*-test (*p*-value)		0.244 ($p = 0.621$)		0.243 ($p = 0.622$)
Observations	16.193	16,193	16,193	16,193
R^2	0.285	0.741	0.287	0.741
Adjusted R^2	0.236	0.723	0.237	0.723

Notes: This table reports results from IV regressions for the relation between natural logarithm of loan spread and Top10LLTIO. We use two instruments, *State Top10LDIO* and *Industry Top10LLTIO* for *Top10LLTIO*. *State Top10LDIO* is annual average of top 10 local dedicated IO for all firms in the same state but in different industries defined by two-digit SIC code. *Industry Top10LLTIO* is annual average of top 10 LLTIO for all other firms within the same industry defined by two-digit SIC code. Columns (1) and (2) report results from the second-stage regressions for overall sample and rated sample only, respectively. Time-varying top3 bank FE are captured by multiplying year FE by three dummies that are set to 1 if the lender belongs to top3 banks that issue most loans according to Ross (2010): JP Morgan Chase, Bank of America, and Citi Group. Robust standard errors are two-way clustered at the borrowing firm and year levels. The list of variable definitions and measurements is shown in the Appendix.

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 11 Robustness checks

VARIABLES	(1) *Logspread*	(2) *Logspread*	(3) *Logspread*	(4) *Logspread*
IO	0.015	0.012	0.015	0.013
	(0.331)	(0.265)	(0.320)	(0.277)
Top10LLTIO	−0.141***			
	(−2.402)			
Top10LSTIO	0.154	0.147		
	(1.219)	(1.188)		
Top10LQIO		−0.243***		
		(−3.797)		
Top10LLTIO2			−0.174**	
			(−2.646)	
Top10LSTIO2			0.234	
			(1.679)	
Top10SLTIO				−0.202**
				(−2.575)
Top10SSTIO				0.145
				(0.977)
Financial variables controlled	Yes	Yes	Yes	Yes
Loan type controlled	Yes	Yes	Yes	Yes
Loan purpose controlled	Yes	Yes	Yes	Yes
Industry* year fixed	Yes	Yes	Yes	Yes
Bank fixed	Yes	Yes	Yes	Yes
Top3 bank* year fixed	Yes	Yes	Yes	Yes
MSA* year fixed	Yes	Yes	Yes	Yes
Two-way clustered	Yes	Yes	Yes	Yes
Observations	16,658	16,658	16,658	16,658
R^2	0.742	0.742	0.742	0.742
Adjusted R^2	0.720	0.721	0.721	0.720

Notes: This table reports the relation between loan spread and LIO after controlling for IO in general, firm characteristics, loan characteristics, macroeconomic variables, bank FE, as well as time-varying industry, top3 banks, and time varying MSA location FE from 1995–2009. The dependent variable is *Logspread* for all models. An institutional owner is defined as "local" if the headquarters of the institution is within a 100-mile radius of the company's headquarters in columns (1) and (2). In column (3), Top10LLTIO2 and Top10LSTIO2 are calculated using local firms within a 250-mile radius of the company's headquarters. In column (4), Top10SLTIO and Top10SSTIO are calculated using local firms within the same state. Robust standard errors are two-way clustered at the borrowing firm and year levels. The list of variable definitions and measurements is shown in the Appendix.

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

We report the IV regression results in columns (1)–(4) of Table 10 where we use two estimation methods, namely, two-stage least squares (2SLS) and generalized method of moments (GMM), respectively. The *Chi*-square statistics for the endogeneity test are 2.176 and 2.229, with *p*-values of 0.164 and 0.159, respectively, suggesting that *Top10LLTIO* is, indeed, not endogenous at the conventional significance level. The *t*-statistics for our main instrument, *State Top10LDIO*, is positive and significant at 1% level. The *F*-statistic of joint significance from adding the two IVs is 150.36 and 150.87 when estimated using the 2SLS and GMM, respectively, suggesting that neither IV is weak. The coefficient estimates from the second stage of the IV regression on the instrumented *Top10LLTIO* are −0.269 and −0.277 from the two estimation methods, respectively, significant at 5% level. The results from the IV regressions suggest that *Top10LLTIO* leads to a lower *Logspread*.

5.3 | Further robustness checks

Next, we conduct further robustness tests to support our results from previous tests. First, we control for time-varying location FE by including an interaction term of MSA FE and year FE in each regression. The additional control mitigates the concern that firms cluster in the same area due to unobserved time-varying economic reasons. Second, we limit Top10LLTIO to concentrated local index-tracking IO (Top10LQIO) which does not have discretion with respect to investment selection. This exercise mitigates the concern that our documented LLTIO effect is driven by a better selection of investments by Top10LLTIO due to their geographic proximity. Finally, we use alternative definitions for "local" by requiring the distance between the headquarters of the firm and IO to be 250 miles (Top10LLTIO2) and requiring the two headquarters to be within the same state (Top10SLTIO).

We report the results from these further robustness checks in Table 11. In column (1), we see that the coefficient estimate for Top10LLTIO continues to be negative and significant at 5% level after including the additional time-varying location FE. In column (2), the coefficient for Top10LQIO is also negative and highly significant with inclusion of the time-varying location FE, suggesting that the presence of local informed IO, even though it is not driven by investment selection, leads to lower loan spread. The alternative proxies for LLTIO also continue to be negative and highly significant as we see in columns (3) and (4). In summary, the robustness checks provide further support for the LLTIO effect.

6 | CONCLUSION

We examine how *creditors* respond to informed *equity* ownership in this paper and show that the presence of concentrated LLTIO is associated with more favorable loan terms in bank loan contracting. We show that the LLTIO effect exists due to the long-term monitoring role of equity investors who are geographically proximate. We also provide empirical evidence to support our hypothesis that the relation between long-term informed equity ownership and loan terms is driven by the net benefit to creditors from having a monitoring ownership. In addition, we identify mechanisms through which sophisticated creditors benefit from Top10LLTIO: Including local index-tracking IO's monitoring that improves focal firms' risk profile (fewer covenant violations) as well as better internal governance (fewer "lucky" director and lower E-index).

The LLTIO effect is only significant when conflicts of interest between creditors and Top10LLTIO's ownership stakes are not too high and when substituting location-driven monitoring mechanism is not in place. This result is robust to controlling for firm characteristics, loan characteristics, loan contracting terms, time-varying firm industry FE, bank FE, and time-varying top3 bank FE. The results continue to hold for LLTIO that does not have the discretion to select investments and after controlling for time-varying location FE. Future studies could examine how the LLTIOs exercise their monitoring function and how geographic proximity changes the cost-benefit analysis for these institutions with respect to monitoring in more detail.

ACKNOWLEDGEMENTS

We thank Kee-Hong Bae, Richard Borghesi, Soku Byoun, Hinh Khieu, Jin-Mo Kim, Yong-Cheol Kim, Jieun Lee, Craig Lewis (the editor), Stephan Siegel, PK Sen, Deming Wu, and seminar participants at University of Washington, Bothell, and conference participants at the FMA 2014 Annual Meeting for comments and suggestions. We thank the review committee of the Joint Conference and Symposium of Allied Korean Academic Associations Annual Meeting for recognizing our work with a best paper award. Ha-Chin Yi recognizes the financial support from McCoy College of Business Foundation. All remaining errors are our own.

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How to cite this article: Chang K, Li Y, Yi H-C. Informed equity ownership and bank loan contracting. *J Bus Fin Acc*. 2021;*48*:1368–1403. https://doi.org/10.1111/jbfa.12517

APPENDIX
VARIABLE DEFINITIONS

Variable	Name	Definitions and measurements	Source
Bank loan spread	*Spread*	Initial all-in-drawn spread over London Interbank Offered Rate (LIBOR)	DealScan
Log (loan spread)	*Logspread*	Log of initial all-in-drawn spread over LIBOR	DealScan
S&P500 dummy	*S&P500*	Takes 1 if a firm belongs to S&P500 else 0	Compustat
Urban10	*Urban10*	Takes 1 if a firm belongs to the top 10 urban metropolitan statistical areas (MSAs) else 0	

Variable	Name	Definitions and measurements	Source
Close bank	*Close bank*	Takes 1 if lenders and borrowers are located within 100 miles else 0	Compustat, DealScan
Relation dummy	*Relation dummy*	Takes 1 if a borrower has borrowed from the same bank before else 0	DealScan
Institutional ownership	*IO*	Number of shares held by institutional investors/number of total shares outstanding	Thompson Reuters 13F
Top10 Institutional Ownership	*Top10 IO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors/number # of total shares outstanding	Thompson Reuters 13F
Top10 Local Institutional Ownership (LIO)	*Top10 Localown*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that have headquarters within 100 miles from headquarters of the borrowing firm/number of shares owned by the largest 10 institutional investors	Thompson Reuters 13F
Top10 short-term institutional ownership	*Top10 STIO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to the transient type by Bushee (1998)/number of total shares outstanding	Thompson Reuters 13F
Top10 long-term institutional ownership	*Top10 LTIO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to either the dedicated or quasi-indexer type by Bushee (1998)/number # of total shares outstanding	Thompson Reuters 13F
Top10 local short-term institutional ownership	*Top10 LSTIO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to the transient type by Bushee (1998) and have headquarters within 100 miles from headquarters of the borrowing firm/number of shares owned by the largest 10 institutional investors	Thompson Reuters 13F
Top10 local dedicated institutional ownership	*Top10LDIO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to the dedicated type by Bushee (1998) and have headquarters within 100 miles from headquarters of the borrowing firm/number of shares owned by the largest 10 institutional investors	Thompson Reuters 13F

Variable	Name	Definitions and measurements	Source
Top10 local quasi-indexer institutional ownership	*Top10LQIO*	Number of shares held by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to the quasi-indexer type by Bushee (1998) and have headquarters within 100 miles from headquarters of the borrowing firm/number of shares owned by the largest 10 institutional investors	Thompson Reuters 13F
Top10 local long-term institutional ownership	*Top10 LLTIO*	Top10LLTIO = Top10LDIO+Top10LQIO	Thompson Reuters 13F
Top10 non-local long-term institutional ownership	*Top10 NLLTIO*	Ownership by the largest 10 (measured by stakes in the borrowing firm) institutional investors that are identified as belonging to the quasi-indexer or the dedicated type by Bushee (1998) and have headquarters beyond 100 miles from headquarters of the borrowing firm	Thompson Reuters 13F
Total Assets	*TA*	At	Compustat
Log (Total Assets)	*LogTA*	Log(at)	Compustat
Leverage	*Leverage*	Total debt/TA	Compustat
Tobin's Q	*Tobin's Q*	Market value of assets/Book value of assets	Compustat
Return on Assets	*ROA*	Net income/TA, ni/at	Compustat
R&D/Total Assets	*R&D/TA*	Xrd/at	Compustat
Intangible Assets/Total Assets	*Intangible/TA*	Intan/at	Compustat
Dividend dummy	*Div dummy*	Takes 1 if a firm pays dividends else 0	Compustat
Net Fixed Assets/Total Assets	*NFA/TA*	Ppent/at	Compustat
Standard deviation of cash flows	*STD CF*	Standard deviation of previous five year cash flows	Compustat
Log(Loan amount)	*Log(Loan amount)*	Log(facility amount in million US dollars)	DealScan
Number of lenders	*Number of lenders*	Number of syndicate members	Dealscan
Performance Pricing	*Performance pricing*	Dummy. Takes 1 if the loan has a performance pricing provision else 0	Dealscan
Secured loan	*Secured loan*	Dummy. Takes 1 if loan is secured else 0	DealScan
Missing Secured loan	*Missing Secured*	Dummy. Takes 1 if *Secured loan* information is missing else 0	DealScan
Short-term revolver loan	*St revolver*	Dummy. Takes 1 if loan is short-term revolver else 0	DealScan
Long-term revolver loan	*Lt revolver*	Dummy. Takes 1 if loan is long-term revolver else 0	DealScan
Term loan	*Term loan*	Dummy. Takes 1 if loan is term loan else 0	Deal Scan
Other loan	*Other loan*	Dummy. Takes 1 if loan is other loan else 0	Deal Scan
Loan Maturity	*Maturity*	Maturity of loans, expressed in months	Deal Scan

Variable	Name	Definitions and measurements	Source
Long-term bond credit rating	*LT CR rating*	Following Klock et al. (2005), the long-term credit rating is converted to numerical numbers ranging from 1(D) to 22(AAA)	Compustat
Investment grade	*Invgrade*	Dummy. Takes 1 if a company's S&P long-term credit rating is BBB- and above else 0 (0 includes not rated firms)	Compustat
Investment grade2	*Invgrade2*	Dummy. Takes 1 if a company's S&P long-term credit rating is BBB- and above and takes zero if the long-term rating is below BBB- (0 does not include not rated firms)	Compustat
Rated status	*Rated*	Dummy. Takes 1 if a company has S&P long-term credit rating else 0	Compustat
Term spread	*Term spread*	Annual term spread (10 year to 1 year Tbond spread)	FED
Credit spread	*Credit spread*	Annual credit spread (difference in yields of BBB and AAA corporate bonds)	FED
Lucky CEO	*Lucky CEO*	Dummy. Takes 1 when options to the CEO are granted at the lowest stock price of the month else 0.	Bebchuk et al. (2010)
Lucky director	*Lucky director*	Dummy. Takes 1 when options to directors are granted at the lowest stock price of the month else 0.	Bebchuk et al. (2010)
E-index	*E-index*	Governance index (composed of six items)	Bebchuk et al. (2009)
G-index	*G-index*	Governance index (composed of 24 items)	Gompers et al. (2003)