Credit Conditions when Lenders are Commonly Owned

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October 6, 2025

Abstract

We investigate how common ownership between lenders affects the terms of syndicated loans. We provide a novel view on the role of common ownership in mitigating information asymmetries on the quality of borrowers and the contractual distortions of lending conditions. Empirically, we show that higher levels of common ownership lower loan spreads, decrease the share of loans retained by the lead bank, and relax liquidity constraints at issuance. We use a novel exclusion restriction based on deposit multimarket contact to identify the effect of common ownership on loan pricing after accounting for its impact on lenders' participation in the syndicate.

Keywords: common ownership; syndicated loans; information asymmetries

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1 Introduction

Over the last two decades, the banking sector has become increasingly interconnected due to the steady growth of shareholders owning equity in multiple banks; the literature refers to those shareholders as "common owners". In 2023, the four largest U.S. asset managers (BlackRock, Vanguard, State Street, and Fidelity) collectively held, on average, over 20% of the outstanding shares of the four largest commercial banks (JPMorgan Chase, Bank of America, Citigroup, and Wells Fargo).[1]

Common ownership affects credit conditions and availability in complex ways. Seminal empirical work has emphasized its potential downside: an investor holding controlling stakes in multiple competing firms might influence their pricing to soften competition (Azar et al., 2018, 2022; Azar and Ribeiro, 2022; Ederer and Pellegrino, 2025). Recent studies have also documented potential benefits of common ownership in product markets, such as facilitating information spillovers and fostering collaboration; these benefits can coexist with competitive effects (He and Huang, 2017; López and Vives, 2019; Antón et al., 2025). Despite these insights, there remains limited evidence on the role of common ownership in financial intermediation.

In this paper, we propose a novel potential upside of common ownership: reducing information asymmetries in lending relationships. Specifically, we examine asymmetries among lenders in syndicated loan markets, where lead banks possess an informational advantage regarding the borrower's risk profile relative to other participants and bear monitoring responsibilities. We conjecture that a lender with superior information, such as the lead bank, can truthfully transmit such information to another lender when the two are interconnected via a common shareholder. Common ownership thus enables the lead bank to credibly share private information about the borrower's quality directly with the commonly owned syndicate members, eliminating the need for costly cash commitments. In effect, common ownership functions as a technology that commits the lead bank to transmit private information. As a result, credit spreads more accurately reflect true borrower risk, potentially improving both risk pricing and credit availability.

Regulators explicitly acknowledge that common ownership between the lead bank and potential syndicate members can be conducive to the exchange of information between investors in syndicated loans (European Commission, 2019). This practice is not considered anticompetitive per se; however, lenders should not collude or otherwise harm the borrowers.

[1] Authors' calculations based on SEC Schedules 13G/13G-A and issuers' proxy statements: JPMorgan Chase & Co.; Bank of America Corporation; Citigroup Inc.; Wells Fargo & Company.

The syndicated market has been subject to repeated investigations by the U.S., European, British, Dutch, and Spanish authorities to evaluate possibly harmful exchanges of information. High levels of common ownership would facilitate those exchanges: this direct effect of common ownership is supported by anecdotal evidence, with Shekita (2021) compiling 30 case studies of interventions by common owners on corporate governance.

We proceed in two steps. First, we develop a model to derive empirical predictions on the effects of common ownership in reducing information asymmetries, which, in turn, affect loan prices, the ownership structure within the loan, and the overall volume of lending. The lead bank represents a penniless borrower: the borrower and the lead bank privately observe the type of borrower, which can be either good or bad.[2] As the assets of the lead bank are insufficient to fund the borrower's project, the lead bank needs to form a syndicate. We distinguish between two scenarios: high and low common ownership. Only when common ownership is high can information on the borrower type be truthfully transmitted by the lead bank to the syndicate members. When common ownership is low, asymmetric information implies that, in equilibrium, the lead bank will have to promise higher returns to the syndicate members and commit its funds to the loan. By doing so, the lead bank signals the quality of the borrower to other potential lenders. This use of own funds tightens capacity constraints at issuance: lead banks that have committed more funds to loans with low common ownership have less liquidity available to invest in new loans over a given horizon. By contrast, when common ownership is high, lending takes place under the conditions that would prevail with symmetric information. In sum, at high levels of common ownership: (i) the interest rate paid to syndicate members is lower; (ii) the lead bank retains a smaller share of the loan; and (iii) capacity constraints at issuance are relaxed.

In our model, lead arrangers take externalities into account and align their interests with the other lenders (as in Antón et al. 2023). We obtain predictions (ii) and (iii) (relating common ownership to lower retained funds and relaxed liquidity constraints) only if, on top of aligning parties' interests, common ownership also facilitates the transmission of information from the lead arrangers to the syndicate members. We empirically document a positive relationship between common ownership and the degree of overlap between directors and senior executives among lenders. The vast majority of loan officers are directors and senior executives (Gao et al., 2020). This positive correlation supports the plausibility of information transmission between lenders, for example, through connected executives or directors,

[2] The source of asymmetric information can be the probability of successful project completion, as we currently assume in the model, or the cost of monitoring the firm, as in Sufi (2007). The predictions of the model remain unchanged.

when common ownership is sufficiently high.

In the second step, we empirically test our novel predictions using data on loans syndicated in the U.S. between 1990 and 2017. The syndicated lending market provides an ideal setting to test the three predictions of our theoretical framework. Although multiple banks can participate in a loan, only the lead bank conducts due diligence of the client: this creates a problem of information asymmetry between the lead bank and syndicate participants (Sufi, 2007; Ivashina, 2009). A syndicated loan typically consists of several tranches (facilities). After receiving the mandate, the lead bank announces to the market the non-price characteristics of the loan and its facilities, such as collateral and maturities. The price of each facility and the composition of the syndicate are set on the market, resulting in variations in the price and composition across facilities of the same loan. In contrast, default risk and creditor rights are essentially constant across facilities of the same loan: lenders can force the borrower into bankruptcy if credit events occur, such as payment defaults or covenant violations.[3] Hence, in our most demanding specifications, we can credibly identify differences in lending conditions between facilities *within* a loan with varying degrees of common ownership while keeping the default risk constant.

We find support for all three predictions in the data. High levels of common ownership between the lead bank and the syndicate participants are associated with lower prices. In panel regressions, we identify the impact of common ownership on prices by leveraging variation in common ownership across facilities and loans. We obtain these results in specifications that account for other factors potentially affecting the loan spread, including an extensive set of controls and fixed effects related to: the loan and the facility; the borrower; and the lead bank. Coefficient estimates indicate that a one–standard deviation increase in the average facility-level common ownership is associated with a reduction in loan spreads of 3.40 basis points (bps); using the maximum common ownership within the facility as the covariate yields a similar 3.18 bps decrease. The average spread is around 188 bps. We discretize our common ownership measure into five indicator variables corresponding to the quintiles of its support. Using the average common ownership measure, our estimates show that reductions in spread are relevant only for high levels of common ownership (quintiles 4 and 5) and that those reductions are monotonically increasing in common ownership. Within those quintiles, moving from the minimum to the maximum common ownership reduces spreads by 0.94 to 4.02 bps (average facility spread in quintiles 4–5 is about 193 bps). We also document that vertical common ownership between lenders and borrowers is associated with a

[3] Covenant-lite loans presenting a split structure are an exception, with different financial covenants between tranches; we remove them from the sample.

spread reduction of similar order (4.65bps), consistent with reduced double marginalization and information frictions.

In what follows, we describe three additional identification strategies verifying that our findings do not reflect the impact of unobservables on loan pricing correlated with the presence of commonly owned lenders. First, we disentangle the role of common ownership on syndicate participation from loan pricing. We explicitly model that lenders' decisions to enter the deal may depend, among other factors, on the level of common ownership with the lead arranger and other unobservables collected in the error term. We employ a novel exclusion restriction in the selection equation defined as a measure of multimarket contact in bank deposits between the lead bank and the potential members (Hatfield and Wallen, 2022), along with the geographic distance between lenders. As expected, high common ownership with the lead arranger encourages lenders' participation, along with their degree of multimarket contact and geographical vicinity. Importantly, after accounting for selection, our findings on loan pricing remain consistent. We conclude that common ownership reduces the spread both through the book-building process and, more directly, by mitigating information asymmetries between lenders.

Second, we estimate the effect of common ownership on the pricing of facilities *within* a given loan. Leveraging loan fixed effects holds borrower identity, underlying default risk, and creditor rights constant, as we exploit only within-loan variation in syndicate composition across facilities, while controlling for facility type, size, and maturity. Using the maximum common-ownership measure at the facility level, a one–standard deviation increase in common ownership reduces spreads by 6.74 bps, an effect that is statistically, as well as economically meaningful.

Third, we exploit the variation in common ownership determined by an arguably exogenous shock: the merger between two large asset managers. Following Azar et al. (2018), this identification strategy uses the variation in common ownership across loans implied by the hypothetical combination of the two parties' portfolios as of the quarter before the announcement of the merger. We use a difference-in-differences design to demonstrate the negative relationship between common ownership and spreads. All our tests lend credibility to the two key assumptions required by the design (no anticipation and parallel trends), and we show that our setting is robust to the concerns raised in the literature about using mergers as exogenous shocks (Lewellen and Lowry, 2021). We find that treated loans are funded by lenders who experience a significant increase in common ownership ties after the merger; the average implied increase in common ownership is about 3.6 percent. Our coefficient estimates imply that treated facilities experience a reduction in spreads of roughly 17 to 25 bps relative to controls.[4]

Importantly, our identification approach does not rule out possible competitive effects of common ownership, as highlighted by the literature. Instead, our estimates reflect the aggregation of positive (mitigation of asymmetries) and negative (softening competition) externalities; in our setting, the first effect prevails, resulting in lower spreads.

We now present the results related to the other two testable implications of the model. According to the second prediction, the lead bank retains lower funds with high common ownership. We find that an increase of one standard deviation in common ownership is associated with a statistically significant decrease in the amount of the loan retained by the lead bank, ranging between 0.30 and 0.78 percentage points. The lead arranger retains, on average, 14.60% of the loan amount. In analyzing the share of loan retained by the lead arranger, we implement Blickle et al. (2020)'s approximation method to compute estimates of the post-origination loan shares held by the lead arranger, accounting for the presence of originate-to-distribute loans and sample selection in reported shares.

Finally, we provide evidence that common ownership mitigates lead arrangers' capacity constraints. Specifically, we show that when lead banks commit larger shares to loans with low common ownership, they significantly reduce their subsequent underwriting activity. Quantitatively, a one–standard deviation increase in lagged low common-ownership lending intensity lowers current lending intensity by about 46% of the average lead-bank market allocation. This dynamic pattern suggests that common ownership not only lowers retention at origination but also helps sustain lead banks' lending capacity over time.

We are careful to rule out alternative explanations for our findings. In all our specifications, we control for vertical relations, specifically common ownership between lenders and borrowers. We also account for other tools employed to overcome moral hazard and adverse selection in the syndicated loan market. Specifically, we consider the relationships between syndicate members by looking at the lead lender's past relationships with the syndicate members, as well as the "reciprocity" in lender participation, whereby the lead and the member banks in one loan switch their roles as lead and participants in another syndicated loan. Reputation effects are captured by lead bank fixed effects. Our results show that common ownership complements other mechanisms that mitigate information asymmetries.

Finally, we provide two additional pieces of evidence consistent with common ownership as a mechanism of information transmission. First, we empirically show that common ownership has an impact only in the case of new borrowers, as the lead arranger is more

[4]This is a larger effect than in the panel estimates because the merger captures a local effect among highly connected lenders.

likely to hold an informational advantage over the syndicate members. Second, we exploit the directionality of our common ownership measure and propose a falsification test of our theory. We conjecture that information flows from the lead bank to the syndicate members; thus, only common ownership between the lead bank and the syndicate members (that is, the weight the lead places on each member's profits) should affect our outcome variables, not common ownership in the reverse direction. Our results confirm this intuition, thus providing an indirect confirmation that information transmission is effectively initiated by the lead bank.

These results offer practical guidance to policymakers. We provide novel empirical evidence consistent with a flow of information between the lead bank and the commonly owned syndicate member banks. As a result, the distortions caused by information asymmetry on the terms of credit contracts are mitigated through common ownership. We acknowledge that, on top of the beneficial effects on the conditions of credit documented in our analysis, common ownership may be detrimental for the borrower by, for example, preempting the entry of lenders outside the group of commonly owned banks. The study of these (potentially anticompetitive) effects will be of relevance for future research.

Related literature Common ownership has recently attracted significant attention from financial and industrial economists. The literature mainly focuses on the common ownership hypothesis, according to which an investor holding a controlling stake in several firms belonging to the same industry might influence their pricing with the purpose of softening competition (Azar et al., 2018, 2022; Ederer and Pellegrino, 2025).[5] Common ownership may also generate positive outcomes by facilitating information spillovers or fostering product market collaboration (Antón et al., 2025; López and Vives, 2019; He and Huang, 2017). We advance this literature by identifying a new upside of common ownership in lending relationships: common ownership can reduce information asymmetries among banks and thereby mitigate distortions in credit conditions.

Recent literature shows how group affiliation affects borrower-lender relationships. Saidi and Streitz (2021) look at the link between credit concentration and industry markups, where common lenders induce less aggressive behavior among their borrowers. Massa and Rehman

[5] Boller and Scott Morton (2020) use the inclusion in a stock market index to identify the impact of an increase in the overlap among investors. Newham et al. (2022), Ruiz-Pérez (2019) and Xie (2021) analyze the effect of common ownership on entry. Antón et al. (2023) investigate how managerial incentives can link common ownership and competition. Aslan (2024) looks at the relationship between common ownership and costs. Backus et al. (2021a) use a test of conduct to reject that common ownership has a large effect on markups. Comprehensive reviews of this growing literature by Ederer and Tecu (2025), Schmalz (2021) and Backus et al. (2020) provide a summary of the empirical evidence.

(2008) study the relationship between mutual funds and banks in the same financial group, providing evidence of direct information flows within the financial conglomerates through informal channels, such as personal acquaintances. Jiang et al. (2010) investigate the simultaneous holding of both equity and debt claims of the same company by non-commercial banking institutions in syndicated loans; they show that syndicated loans with dual holders have lower spreads than those without. Closer to our study, Cici et al. (2015), Ojeda (2019), and Wang and Wang (2019) study the impact of common ownership between lenders and borrowers. Overall, they document lower loan spreads, larger loans, and more frequent lending activity in the presence of common ownership. He et al. (2024) distinguish between common and cross-industry holdings linking firms to outside banks that they have not borrowed from. While our study focuses on common ownership among lenders, we recognize that "vertical" common ownership between lenders and borrowers may also influence loan terms by reducing information asymmetries and double marginalization. We account for this in our empirical design and discuss its effects.

We also contribute to the literature on syndicated lending. We show that common ownership contributes to reducing the distortions of risk pricing and credit availability traditionally attributed to information asymmetries. Early contributions in this body of work have documented that the lead bank, which conducts the due diligence and acts on behalf of the borrower, mitigates asymmetric information vis á vis syndicate members by retaining a larger share of the loan (Sufi, 2007; Focarelli et al., 2008; Ivashina, 2009). Analogously, as a larger portion of the loan retained by the lead bank signals a commitment by the lead arranger in monitoring and borrower quality, Lin et al. (2012) show that the fraction held by the lead bank increases in the divergence between control rights and cash-flow rights of the borrower's largest shareholder. Finally, Bruche et al. (2020) highlight that the presence of a pipeline risk taken by the lead arranger when originating a loan also plays a role in loan retention. Other aspects of syndicated lending examined in the literature include how the composition of the syndicate affects loan spreads (Lim et al., 2014), the propensity to syndicate a loan (Dennis et al., 2000), the relationship between final spreads and fees (Berg et al., 2016; Cai et al., 2018), and the role of covenants (Drucker and Puri, 2009; Becker and Ivashina, 2016).

2 Institutional Setting

2.1 Syndicated Credit: Asymmetric Information and Loan Structure

Syndicated lending is an important source of financing for U.S. corporations. Sufi (2007) and Ivashina (2009) report that more than 90% of the largest 500 non-financial Compustat firms in 2002 obtained a syndicated loan between 1994 and 2002. In 2006, syndicated loan issuance surpassed corporate bond issuance with a volume of $1.7 trillion. More recently, the Federal Reserve's Terms of Business Lending survey documented that 44% of all commercial loans in 2013 were syndicated loans.

The syndicated loan market operates over the counter. Transactions are the result of informal interactions between borrowers and lenders. The borrowers are firms that seek funding from the syndicate to leverage large capital investments. The lead bank or arranger heads the syndicate. Other syndicate members are banks or institutional investors.

The borrower solicits potential lead banks to submit a bid. These banks propose their syndication and pricing strategy to the borrower. The selected lead bank then receives the mandate to issue a loan and performs the due diligence. Details of the mandate signed between the lead bank and the borrower remain confidential, including any potential rearrangement of the fees to the lead bank depending on the outcome of the syndication. According to a recent report by the International Organization of Securities Commissions (IOSCO, 2024), since the loan is syndicated to a broad range of potential investors, each investor has little negotiation power vis-à-vis the lead bank. Hence, our theoretical framework treats the investor market as perfectly competitive and assumes that the lead bank, representing the borrower, holds full bargaining power.

Syndicated loans are not considered "securities" under federal or state laws, as recently confirmed by the United States Court of Appeals for the Second Circuit in *Kirschner v. JPMorgan Chase Bank, N.A.* (Kirschner v. JPMorgan Chase Bank, N.A., 2023). Accordingly, loan syndication is not treated as a "security distribution." Consequently, the due diligence standards are left to the criteria of the lead arranger, who also disclaims any responsibility for the accuracy of the information included in the memorandum provided to the potential investors (Ivashina, 2005). Following Sufi (2007), most of the literature considers private information in the hands of the lead bank as a defining feature of the industry. In addition, lead arrangers are typically tasked with loan monitoring for the duration of the deal. This industry is, therefore, characterized by the contemporary presence of adverse selection and moral hazard.

More recent work has documented an increase in originate-to-distribute lending, especially in the non-investment grade loan segment targeted toward institutional investors (Bord and Santos, 2012; Bruche et al., 2020). When the lead arranger syndicates a loan with the intention of selling it immediately, pipeline risk arises: the loan may become a "hung" deal if the market is unwilling to absorb it under the arranged terms (Bruche et al., 2020). Pipeline risk adds a layer of complexity that intersects with asymmetric information; loan retention in originate-to-distribute lending may reflect pipeline risk rather than screening or monitoring motives. In the empirical section, we show that pipeline risk is unlikely to explain our results (see Section 6). We also take this feature of the market into account in our empirical strategy (see Section 5).

The loan issued by the lead bank is divided into tranches, or facilities, of different types (credit line, term loan), amount, and maturities. All non-price terms of the loan, such as type, amount, maturity, purpose, collateral, and covenants, are set before the marketing phase starts. Among these, only type, amount, and maturity vary across facilities within a loan. Covenant-lite loans are an exception as they may present a split structure: term loan facilities lack financial covenants, while credit lines contain traditional financial covenants. Following Berlin et al. (2020), we identify the deals having split control rights and remove them from the sample (see Section 4).

The interest rate paid to syndicate members, calculated as the spread over LIBOR, and the composition of the syndicate are determined during the marketing phase. The lead bank proposes the price for each facility in the loan, and potential syndicate members decide whether they wish to buy at the specified spread. The deal is closed when the desired level of demand is met. The lead bank can subscribe part of the loan to close the deal, although it is not obligated to do so. If credit events occur, such as payment defaults or covenant violations, syndicate members can force the borrower into bankruptcy.

Finally, the syndicated lending market is highly concentrated. JPMorgan Chase and Bank of America arranged around 63% of the sample's loans. We take care of concentration in our empirical analysis by running our tests excluding the loans arranged by these two banks.

2.2 Common Ownership in the Syndicated Loan Market

Asset managers, such as BlackRock, Vanguard, State Street, and Fidelity, are often shareholders in both the lead bank and the syndicate members, and their holdings have been growing substantially over the recent years, as documented in Table B.I. Recent literature (Appel et al., 2016; Brav et al., 2019) shows that institutional investors use their voting blocs to influence the governance of firms. Asset managers may exert their control through "voice" (Edmans et al., 2019), using direct interventions, such as monitoring the managers or suggesting strategic changes. Matvos and Ostrovsky (2008) show that in mergers with negative acquirer announcement returns, mutual funds holding shares in both the acquirer and the target are more likely to vote for the merger. He et al. (2019) provide evidence that institutional investors play a more active monitoring role when common ownership is high. Appel et al. (2016) show that the presence of mutual funds directly impacts the composition of the board of directors, and in particular, an increase in ownership by passive funds is associated with an increase in non-executive directors entrusted by the shareholders.

In our empirical framework, we study situations in which the lead bank and the members in the syndicate are commonly owned by large institutions, exploiting variations in the level of common ownership across loans and across facilities within a loan. We conjecture that common ownership facilitates the transmission of private information from the informed lead bank to the uninformed syndicate members. Regulators explicitly recognize the possibility of such influence. In a recent report on loan syndication and competition in credit markets, the European Commission acknowledges that common ownership between the lead bank and the syndicate members can facilitate the exchange of the information that the lead bank acquired while performing its due diligence (European Commission, 2019). The syndicated market has been subject to repeated investigations by the U.S., European, British, Dutch, and Spanish authorities to evaluate possibly harmful exchanges of information: see the Jones Day Commentary. In 2006, the Antitrust Division of the U.S. Department of Justice (DOJ) investigated private equity syndicates ("club deals"), an industry that shares parallels with syndicated lending. The DOJ expressed concern that syndicate members may conspire to artificially reduce the acquisition price of the targets of those deals by allocating leveraged buyout opportunities among participants. In Section 4.4, we provide further evidence on the plausibility of information transmission through shared directors and executives between lenders via the common owner. Finally, a notable example of direct intervention by passive funds in the decision-making process of lenders is offered by BlackRock's Investment Stewardship division, which engages with lenders' executives and board directors to address the lenders' business practices. We look at the data on the engagement activities of the division in financial companies; BlackRock regularly engages in activities related to risk management, business oversight, and corporate strategy.

Our conversations with industry experts confirm that the subscription process of syndicated loans involves close cooperation between market participants. On the one hand, in the presence of ownership overlap, a lead bank may selectively exchange pre-bid information during the formation of the syndicate to induce an investor to subscribe a loan. On the other hand, given the opaque and unregulated market setting, these exchanges may exacerbate conflicts of interest between the bloc of lead bank and syndicate members and the creditor.

3 Hypothesis Development

Consider a borrower who owns a project but lacks the financial resources to carry it out.[6] The borrower delegates the lead bank (L) to form a syndicate for a loan of size 1; it then shares the returns of the investment with the lead bank. A continuum of potential syndicate members (M) operate in perfectly competitive financial markets and have the financial resources to fund the project.[7] We denote by A, with $0 < A < 1$, the maximum loan amount the lead bank can pledge. A then represents the lead bank's liquidity.

The borrower's project can be one of two types: the good type (G) has a probability of success equal to p; the bad type (B) has a probability of success $q < p$.[8] Independent of the borrower type, the project yields R in the case of success and 0 in the case of failure. Throughout the scenarios we consider, the lead bank knows the type of the borrower's project. We use α and $(1 - \alpha)$ to denote the potential syndicate members' (M) prior probabilities that the borrower's project is of type G and type B, respectively.[9]

We assume that only the good borrower's project has a positive net present value (NPV) ($pR > 1$), and that the bad borrower's project has a negative NPV ($qR < 1 - A$). Moreover, we assume that the project return to the lead bank representing a bad type ($qR - A$) is bounded away from zero, which makes it costly for the lead bank to signal the good type through the funding contract's design and achieve separation from the bad type. This assumption implies that a lead bank representing a good borrower would be strictly better off if it could truthfully disclose its information about the quality of borrowing.

[6]We extend the model in Tirole (2006), Chapter 6, which in turn uses the mechanism design approach in Maskin and Tirole (1990) to solve the contract's design problem. This section describes the model we use to derive our empirical predictions. See the Internet Appendix (Appendix A) for formal derivations.

[7]Our main empirical predictions would not change if we were to assume that only one syndicate member decides to subscribe to the loan, provided the lead bank has full bargaining power.

[8]The model predictions would stay the same if the lead bank had superior information on the cost of monitoring the borrower (see the discussion below).

[9]Parameter α can be interpreted as the fraction of good-type borrowers in the economy or the probability that a given borrower is of type G.

We now describe the funding contracts. A sharing rule determines how the project returns are divided between the lead bank L representing a firm of a given type j ($R_{j,L}$) and the syndicate members M ($R_{j,M}$), with $j = G, B$ and $R_{j,L} + R_{j,M} = R$.[10] The sharing rule is complemented by two additional components. The first is a decision rule on whether the syndicate members extend the loan to a firm of a given type $j = G, B$ ($x_j \in [0, 1]$). The second is the cash the lead bank L invests in the loan ($\mathcal{A}_j \leq A$). In line with our empirical application, all potential syndicate members receive the same offer.

The lead bank L holds all the bargaining power. It designs contracts that can be accepted or rejected by the syndicate members M. When indifferent, L will prefer not to commit any cash to the loan. This reflects, for example, alternative investment opportunities that are more remunerative than the borrower's project.

We solve the model with and without common ownership. Common ownership allows the lead bank to truthfully channel its private information regarding the borrower's probability of success to the commonly owned syndicate members. In other words, common ownership is a technology that permits the lead bank to commit to transmitting its information to investors. As we will see, with common ownership, the cost of credit in the funding contract correctly reflects the borrower's quality. We parameterize the level of common ownership between the lead bank and the syndicate member by κ, capturing the weight that the lead bank L places on the utility of the commonly owned syndicate members.

All agents are risk-neutral, the lead bank is protected by limited liability, and the risk-free interest rate is nil. Next, we describe the scenario without common ownership ($\kappa = 0$) and that with common ownership ($\kappa > 0$).

Funding without common ownership ($\kappa = 0$) This scenario corresponds to our benchmark. The lead bank formulates its contract offer, and the potential syndicate members accept or reject it. We solve for the perfect Bayesian equilibrium of the contract design game. Specifically, we derive the *low-information-intensity* optimum of the contract design game (Rothschild and Stiglitz, 1976; Wilson, 1977). This corresponds to the separating allocation that maximizes the utility of the lead bank representing a good borrower, subject to the constraint that the lead bank representing a bad borrower does not receive any rent. In practice, the separating contract is unappealing to a bad borrower and allows the potential members to break even.[11] In the discussion below, we describe the merits of this choice.

[10] The share of the lead bank is then split between the lead bank and the firm according to a bargaining game outside the model.

[11] Our assumptions guarantee that this optimum allocation exists across the cases we consider (with and without common ownership). The low-information-intensity optimum is the unique perfect Bayesian equi-

In equilibrium, if potential syndicate members subscribe to the loan, the lead bank must choose between the contract targeting the bad borrower and the one targeting the good borrower. By construction, this choice is incentive-compatible. The contract targeting a lead bank representing type B is such that this firm will not be funded. To achieve separation, the contract targeting a lead bank representing type G does two things. First, the lead bank L must pledge all its funds to signal that it is confident about the borrower's future returns ($\mathcal{A}_G = A$). Second, the repayment to investors is set at the minimum allowed by the bad-type incentive-compatibility constraint (equivalently, the maximum $R_{G,L}$), making the bad type indifferent between accepting the contract and remaining inactive: $R_{G,M} = R - A/q$. The good-type contract can be implemented by a debt contract featuring M transferring $1 - A$ upfront and receiving $R - A/q$ if the project succeeds.

Funding with common ownership ($\kappa > \underline{\kappa}$) Consider now the case in which the lead bank places a weight $\kappa > 0$ on the utility of the commonly owned potential syndicate members. There is a fraction of commonly owned potential syndicate members (M_{Co}) and a complementary fraction that is not in common ownership with the lead bank (M_{NCo}). Thanks to common ownership, the commonly owned syndicate members M_{Co} are perfectly informed about the type of borrower represented by the lead bank. We assume that common ownership produces these effects only at high levels, so that $\kappa \geq \underline{\kappa}$. We empirically identify the threshold $\underline{\kappa}$ in the empirical analysis. We use the term "high common ownership" to refer to funding contracts where at least one member exceeds the empirically identified threshold $\underline{\kappa}$.[12]

After sharing with M_{Co} its information about the type of borrower it represents, L announces the contracts it offers to all the potential syndicate members. The timing unfolds as follows. First, the informed commonly owned syndicate investors M_{Co} accept or reject the contract. After observing M_{Co}'s decision, the non-commonly owned investors M_{NCo} make their own accept/rejection decision. By approaching the informed investors first, the lead bank leverages the M_{Co}'s participation decision to convey private information about the borrower's quality.[13] This timing assumption aligns with the institutional setting of

librium under a condition on the parameter α. If this condition is not satisfied, pooling equilibria may also exist (see the discussion below).

[12]The objective function of the lead bank with common ownership is formalized in Equation (**??**) in the Internet Appendix (Appendix A). Since we are interested in transmitting information from the lead bank to the syndicate members, we focus on how common ownership changes the objective function of the lead bank, not that of the potential syndicate members. This approach is empirically validated in Section 6.2, where we show that common ownership between the members and the lead bank does not explain our results.

[13]Although non-commonly owned syndicate investors M_{NCo} cannot observe the borrower's type directly,

loan syndication: post-mandate, the lead bank informally contacts a group of potential investors to target; the lead bank first presents the loan and shares information about the loan terms and the borrower's creditworthiness to these potential investors (IOSCO, 2024).[14] This process is described in Ivashina and Sun (2011) and Bruche et al. (2020). Finally, in line with our empirical framework, any contract offered by the lead bank features identical payoffs to M_{Co} and M_{NCo} (so that $R_{j,M} = R_{j,M_{Co}} = R_{j,M_{NCo}}$, with $j = G, B$).

We solve for the perfect Bayesian equilibrium of the game. We construct an equilibrium where the lead bank representing a bad borrower cannot access funding. Instead, the lead bank representing a good borrower will get the equilibrium contract with symmetric information. In particular, the loan to the good firm is fully underwritten by the members of the syndicate ($\mathcal{A}_G = 0$) in exchange for the transfer of $R_{G,M} = 1/p$. Since they know that the lead bank L channels its private information to the commonly owned syndicate members M_{Co}, the non-commonly owned syndicate members M_{NCo} are able to infer the type of borrower represented by L based on the contracts offered by L and M_{Co}'s acceptance or rejection decision. Consequently, they accept the symmetric-information contract if the commonly owned investors M_{Co} also accept it. It is optimal for the lead bank to offer the symmetric-information contract because it yields the full NPV of the project. The lending contract can be interpreted as a debt contract in which the members of the syndicate lend 1 upfront and get $1/p$ in the case of the project's success, or else the borrower goes bankrupt.

Empirical predictions The model provides a stylized environment to examine the impact of common ownership on pricing and participation in the syndicated loan market. Although simplified, it yields a set of clear, testable predictions that we evaluate empirically in Section 5. We list the empirical implications of our theory (see the Internet Appendix A for their formal derivation).

Proposition 1. *Based on the lending contracts obtained with and without sufficiently high levels of common ownership, where at least one member exceeds the empirically identified threshold $\underline{\kappa}$, we find that:*

1. *The interest rate charged by syndicate members is lower with high common ownership*

they observe the choice of the commonly owned syndicate members M_{Co} and are aware that the lead bank shares its private information with them. They can thus infer quality from M_{Co}'s choice.

[14] Besides being consistent with market practice, the sequence with which the potential investors are approached by the lead bank, together with the fast developments of the facilities' marketing phase, implies that investors may not have information or time to check the composition of other facilities within the same loan: IOSCO (2024). Consequently, we do not expect information spillovers about contract design across facilities of the same loan.

than without common ownership;

2. *The lead bank commits more funds to the loan without common ownership than with high common ownership;*

3. *The lead bank faces tighter liquidity constraints, and thus reduced capacity to arrange syndicated loans, when it has entered loans with low common ownership.*

Absent common ownership, the separation of borrower types (good and bad) requires that the lead bank representing a good borrower is less greedy (compared with high common ownership) and promises higher rewards to the syndicate members. To achieve separation, the lead bank representing a borrower with a good project signals the borrower type by committing A in the loan. The second implication in the proposition depends on the fact that, with low common ownership, the lead bank conveys the quality of the loan through a costly signal (loan retention). With high common ownership, the lead bank achieves separation by channeling its private information to the commonly owned investors. Finally, for the third implication, we show that lead banks that have committed more funds in loans with low common ownership have less liquidity to invest in new loans during a given time horizon.

3.1 Discussion

Common ownership and interest alignment We now consider the situation in which common ownership purely serves as a mechanism to align interests across lenders (Antón et al., 2023), and there is no information transmission. We still expect common ownership to impact the design of the contract because, in contrast to the case without common ownership, the objective function of the lead bank features a weight $\kappa > 0$ attached to the utility of commonly owned syndicate members M_{Co}.

The crucial difference is in the lead bank's decision to retain a share of the loan. With information transmission, the lead bank representing a good borrower does not need to engage in costly signaling through the design of the contract to achieve type separation and, in equilibrium, $\mathcal{A}_G = 0$. If, instead, common ownership only has interest-alignment purposes, in the low-information-intensity optimum, the contract targeting the good borrower must signal the good type by committing all the liquidity of the lead bank to the loan ($\mathcal{A}_G = A$). Thus, if common ownership was mainly about interests' alignment, we should not find evidence consistent with Prediction 2 in Proposition 1 in our empirical application.

Common ownership and pipeline risk Bruche et al. (2020) study the situation in which the lead arranger syndicates a loan with the intention of selling it soon after under the risk that the loan becomes a "hung" deal (pipeline risk). The crucial difference with respect to our setting is the source of information asymmetry. In their model, potential investors (the market) hold private information on their loan valuation. Thus, the lead bank designs the contracts to maximize its profits under demand discovery. If common ownership allows the investors to transmit information to the lead bank credibly, the predictions would be similar to ours.

The reversal of the source of asymmetric information results in a test on the directionality of the information flow to study how common ownership interacts with pipeline risk. When looking at the weights that the syndicate members put on the profit of the lead arranger (from the investors to the lead arranger), the pipeline–risk channel predicts the presence of an effect of the reverse common-ownership measure, κ_{ba}. As we conjecture that the lead bank holds superior information and we focus on the heterogeneity of borrowers' creditworthiness, we use the weights that the lead bank puts on the profit of syndicate members as a proxy for common ownership. In Section 6, we find no statistically significant effect for κ_{ba} under the directionality test.

Model assumptions Although the predictions of our model are derived under the assumption that the lead bank holds private information on the expected return of the borrower, the qualitative results of the model would not change if the lead bank had superior information on the cost of monitoring the borrower (Sufi, 2007). If monitoring costs are unobservable to syndicate members, the lead bank needs to retain a share of the loan to signal that it has the incentive to exert the monitoring effort. Moreover, costly signaling would cause a lower reward to the lead bank and hence a larger reward to the syndicate members.

Tirole (2006) shows that, depending on the value of prior beliefs α, there may exist pooling equilibria in which both types are better off than in the separating allocation considered without common ownership. In such equilibria, the lead bank chooses between accepting a contract in which the borrower is rewarded only in the case of success and a contract with an upfront lump-sum payment A and no investment. In practice, the lead bank representing a bad borrower, which chooses the second option, is offered a bribe to go away. Our focus on the separating equilibrium in the analysis without common ownership is motivated by the fact that such pooling contracts are not offered in syndicated lending. Nonetheless, they still satisfy our prediction on the lead bank's commitment of A in the loan.

Finally, other costly signals could be used to achieve the separation of types without common ownership. For example, the borrower could accept shorter maturities or pledge collateral. However, the non-price dimensions of syndicated loans are set before the marketing stage; that is before syndicates form at the facility level. Moreover, except for maturity, the non-price attributes do not vary across facilities. Any correlation with common ownership would therefore be spurious or non-consequential.

4 Data

Our sample is constructed in two steps: in the first step, we assemble a sample of borrower-bank-loan-facility observations between 1990 and the first quarter of 2017; and in the second, we combine our data with information from Thomson Reuter S34 to determine the common investors of the lead bank and the syndicate members within a loan.

4.1 Sample Construction

Syndicated Loans Our primary data source is the Loan Pricing Corporation's (LPC) DealScan database, which identifies bank-borrower relationships. DealScan contains detailed information on the loan, such as the interest rate paid to the lender group measured in basis points (the all-in drawn spread, which is the sum of the spread of the facility over LIBOR and any annual fees), loan size, loan type (credit line or term loan), purpose (mainly corporate, excluding leveraged buyout), and the presence of collaterals. We restrict the sample to loans issued by commercial banks incorporated in the U.S. to U.S. non-financial firms between 1990 and the first quarter of 2017. In addition, we remove from the sample all loans with split structure in terms of financial covenants; these are term loans tranches that lack financial covenants, while the credit line tranche contains traditional financial covenants. Following Berlin et al. (2020), we create an indicator for split control rights within a loan using the market segment data. If the term loan in a deal is identified as covenant-lite, we assume that the revolver has maintenance covenants and identify the deal as having split control rights. Following Ivashina and Sun (2011), we also exclude second-lien term-loan facilities so that our sample includes only senior facilities; differences in spread across facilities of the same type within a loan cannot arise from differences in their seniority.

We identify the participants in a syndicate at the loan-facility level. Following Ivashina (2009), we classify a bank as a lead bank if its Lender Role field in DealScan is one of the following: administrative agent, agent, arranger, book-runner, coordinating arranger, lead arranger, lead bank, lead manager, and mandated arranger.[15] We then use linking tables from Chava and Roberts (2008) and Schwert (2018) to merge the loan data with borrower and lender characteristics from Compustat, including borrower size, profitability and rating (investment-grade, high-yield, and unrated) and lender size and profitability.[16]

Common Ownership To compute our common ownership measures, we use several sources. The primary one is the common ownership data compiled by Amel-Zadeh et al. (2022) and Kasperk et al. (2024).[17] The dataset covers ownership data for all S&P 1500 companies, including firms with both single- and multiple-class stock structures, starting in 2000q4. Importantly, this dataset adjusts voting rights for shareholders in firms with multiple-class stock structures to reflect actual control rights, ensuring accurate measurement of common ownership for our purposes.

For the period before 2000q4, as well as for any missing data post-2000q4, we utilize Thomson Reuters' S34 database, which consolidates information from the mandatory 13F SEC filings that all institutions with at least $100 million of assets under management are required to report at quarterly frequency. When both sources are available, the data compiled by Amel-Zadeh et al. (2022) and Kasperk et al. (2024) take precedence. We complement the Thomson Reuters S34 data with blockholder information from Schwartz-Ziv and Volkova (2020), who assembled Form 13D/G filings to account for large shareholders (holding over 5%) not covered by 13F reporting requirements, such as individual investors. In addition, we conduct sample checks on other filings reporting information on insider holdings of executives and board members (Forms 3, 4, 5, and 144). These holdings are substantially lower than 5% and have only a minor effect on our common ownership measures; we, therefore, ignore these individual stakes. Finally, we collect data on shares outstanding from the Center for Research in Securities Prices (CRSP), which we merge with historical CUSIP bank codes. The resulting sample allows us to determine which banks within a loan relationship have common institutional investors and the extent of overlapping ownership at the syndicate member-facility-loan level.[18]

[15] In the residual case in which no lead bank or multiple ones are identified, we attribute the role of lead bank to the banks for which the field "Lead Arranger Credit" is marked with "Yes".

[16] Schwert (2018) hand-matches DealScan lender names with Compustat GVKEYs for all lenders with at least 50 loans or at least $10 billion in loan volume. The matching table takes into account bank subsidiaries and bank mergers during the sample period.

[17] We are extremely grateful to Fiona Kasperk and Martin Schmalz for providing access to this comprehensive and carefully curated dataset.

[18] To gauge the reliability of our reconstructed holdings, we compare the distribution of common ownership based on the Thomson Reuters S34 data with the files provided by Kasperk et al. (2024) over their common coverage window (2000q4 onward). Both the Kolmogorov–Smirnov test and the Wilcoxon rank-sum test

4.2 Measures of Common Ownership

The literature proposes several measures of common ownership: see O'Brien and Salop (2000), Antón and Polk (2014), Newham et al. (2022), and Gilje et al. (2020). We adopt the profit weights approach based on the theory of partial ownership developed by Rotemberg (1984). This approach is closely linked to our model and to the theoretical literature on common ownership. In the Internet Appendix (Appendix B), we replicate our main analysis using an alternative, model-free measure of common ownership and obtain similar results.

As in Rotemberg (1984), we assume that the lead bank maximizes a weighted average of shareholder portfolio profits. To construct the profit weights, we rely on O'Brien and Salop (2000). Each lead bank a places a weight κ_{ab_i} on the profit of each syndicate member bank in facility i (b_i) that is overlapping in ownership:

$$\kappa_{ab_i} = \frac{\sum_{s \in S} \gamma_{as} \beta_{b_i s}}{\sum_{s \in S} \gamma_{as} \beta_{as}}, \tag{1}$$

where S is the set of shareholders of lead bank a, and γ and β are, respectively, the voting and cash-flow rights of each investor s. These weights capture the importance to each lead bank of a dollar of profit generated by the syndicate members. We follow the vast majority of the literature and assume that one share corresponds to one vote (the proportionality of voting rights): $\gamma_{as} = \beta_{as}$ and $\gamma_{b_i s} = \beta_{b_i s}$.[19]

Given Equation (1), the average weight that the lead bank a places on the profit of other syndicate members in each facility i is:

$$CO_{ia}^{\text{avg}} = \frac{1}{B_i} \sum_{b=1}^{B_i} \kappa_{ab_i}, \tag{2}$$

where $B_i \in [1, \overline{B}]$ is the number of syndicate members in facility i.

reject equality of the κ weight distributions. In particular, common ownership values using Kasperk et al. (2024)'s measure are systematically smaller than the original κ. The actual difference in central tendency in our specific setting is modest: the median shift between groups is about 0.06 on a 0 to 1 scale. We also re-estimate our main specification (Equation 5, Table III) using only the Kasperk et al. (2024) sample. The coefficients remain virtually unchanged, as discussed in Section 5. The extended panel, including pre-2000q4 data, is indispensable for the most demanding specifications, such as those relying on data subsamples. While the two datasets differ slightly in distribution, our baseline uses Amel-Zadeh and Kasperk from 2000q4 onward, with S34 used only to extend coverage to pre-2000q4 and to fill occasional gaps thereafter; the S34-only comparison serves as a reliability check.

[19]See Backus et al. (2021b) for a discussion on the importance of the one-share one-vote assumption and other measures of common ownership.

As the model suggests that a single commonly owned syndicate member is sufficient to activate the information-transmission channel, we also construct an alternative measure of common ownership for each facility, defined as the maximum level of common ownership between the lead arranger and any syndicate member:

$$CO_{ia}^{\max} = \max_{b_i}\{\kappa_{ab_i}\}. \tag{3}$$

We find that the estimation results remain essentially unchanged using this alternative measure, as discussed in Section 5.

Finally, we repeat the same exercise to determine the degree of common ownership in two additional dimensions: (i) between borrowing firms and banks, and (ii) between syndicate members and the lead arranger ($\kappa_{b_i a} \neq \kappa_{ab_i}$). Measure (i) serves as an additional control to account for common and cross ownership between vertically related firms, while measure (ii) is useful for conducting a falsification test of our hypotheses.

Following Backus et al. (2021b), we decompose the profit weights in Equation (1) to study the sources of common ownership variation at the facility level. Let $IHHI_a = \|\beta_a\|^2$ be the Herfindahl-Hirschman Index for the investors in company a. Define $\cos(\beta_a, \beta_{b_i})$ as the cosine similarity between vectors a and b_i, representing the cosine of the angle between the positions that investors hold in a and those that investors hold in b_i. Backus et al. (2021b) show that:

$$\kappa_{ab_i}(\beta) = \underbrace{\cos(\beta_a, \beta_{b_i})}_{\text{overlapping ownership}} \cdot \underbrace{\sqrt{\frac{IHHI_{b_i}}{IHHI_a}}}_{\text{relative IHHI}}. \tag{4}$$

The first term is the overlapping ownership, which captures the similarity in investor positions. For investors holding positions in both the lead bank a and a syndicate member bank b_i, a higher position will determine a smaller angle with cosine similarity approaching one. The second term captures the relative concentration of investors. Ceteris paribus, if the lead bank has fewer, larger investors, then the value of $IHHI_a$ is large, control rights are relatively expensive, and profit weights $\kappa_{ab_i}(\beta)$ are smaller. Conversely, if the lead bank has many small investors, the value of $IHHI_a$ is small, control rights are relatively cheaper, and profit weights $\kappa_{ab_i}(\beta)$ are larger. In the descriptive analysis below, we use the decomposition in Equation (4) to document the patterns of common ownership.

Finally, we define as common owners all institutions filing the mandatory 13F SEC filings (or, less frequently, 13D/G). In a limited number of cases, those institutions are asset management divisions of the lead bank itself: more precisely, direct investment of a lead bank in other lenders configures a situation of cross-ownership rather than common ownership. We identify those management divisions and create profit weights that exclude them as common shareholders while controlling for the presence of cross-ownership. As those divisions tend to hold very low equity in other lenders, the distribution of profit weights is practically unaffected by such exclusions. For simplicity, our main measure of common ownership, therefore, includes those institutions as shareholders, whereby separately controlling for cross-ownership does not affect our results.

4.3 Summary Statistics

Table I provides the summary statistics. Our final sample consists of 38,631 observations (38,496 with non-missing all-in-drawn spread) borrower-bank-loan-facility observations. We observe 17,454 loans granted to 3,991 firms between 1990 and the first quarter of 2017. We identify 72 lead banks. The average syndicate size is 10.5 members. Syndicates extend loans of $1,069 million on average. Every loan comprises a number of tranches called facilities, which are our unit of observation. On average, a syndicated loan consists of 1.9 facilities. The average facility spread is 189 basis points and the average amount $615 million; 49% of loans are secured by collateral. Most facilities in our sample are credit lines (68%).[20] On average, lead banks retain 19.4% of the facility amount, and this variable is reported for less than half of the observations in our sample.

Common ownership patterns In the U.S. banking sector, the four largest asset managers (Blackrock, Vanguard, State Street, and Fidelity) held together around 20% of the four largest commercial banks' shares in 2017. Figure 1 documents the striking increase in common ownership during our sample period, confirming the findings of previous studies (Azar et al., 2018; Backus et al., 2021b). We calculate profit weights at the facility level and find that, on average, lead arrangers have a weight of 0.66 on the profits of the other syndicate members, with an increase from 0.38 in 1990 to 0.61 in 2017. Following common practice, we trim our measure of common ownership at the 1% level of the left and right tail of the distribution of common ownership at the facility-lead-member level to reduce the im-

[20]In the summary statistics, we present two aggregate types: credit lines and term loans. In the data, we observe more granularity, with different types of term loans (A, B, C, and higher designations). We account for these types in the empirical application. Following Lim et al. (2014), we consider all facilities with designation B or higher as term loan B and use the following three categories for facility types: (i) credit line; (ii) term loan A; and (iii) term loan B and higher.

pact of outliers; our results are unchanged under alternative tail treatments (winsorization), as discussed in Section 5.

To interpret these patterns, we decompose the profit weights into overlapping ownership and relative investor concentration: see Equation (4). Figure 2 shows the results of such decomposition between 1990 and 2016. The blue bar represents the lowest quintile of our measure of common ownership, and the red bar represents the highest quintile. The decomposition shows the two underlying forces driving the growth in profit weights over the sample period. Panel (a) depicts a broad increase in profit weights, $\kappa_{ab_i}(\beta)$, over time. Panel (b) shows that cosine similarity, $\cos(\beta_a, \beta_{b_i})$, is, as expected, higher at high levels of common ownership and exhibits an overall upward trend as common investor positions in lenders have become larger. Panel (c) depicts the relative investor concentration, $\frac{IHHI_{b_i}}{IHHI_a}$, and Panel (d) represents the average concentration level of investors in lead banks only, $IHHI_a$. Taken together, panels (c) and (d) show that while relative investor concentration is rather constant over time, control rights in lead banks characterized by high common ownership have become somewhat cheaper: investor concentration for the lead banks is lower at the top quintile of common ownership, and the gap in investor concentration between the bottom and the top quintiles has increased over time. Such a shareholder structure allows common investors to influence the lead banks' strategies more effectively. With the lead bank having several small investors, $IHHI_a$ will be small and control rights cheaper. This is partly driven by the growth of retail shares at higher levels of common ownership: as retail investors do not have incentives to engage in active governance, they leave more room for common owners to influence the lead banks' strategies.

A variance decomposition for all lead bank-member pairs of profit weights reveals that around 70% of the variation in profit weights comes from overlapping concentration, and relative investor concentration never falls below 30%. Investor concentration has an impact in shaping the variation in profit weights both in the cross-section and over time; for example, at the lowest quintile of common ownership, institutional investors tend to be large and undiversified, thus the lead banks put more weight on their own profits.

4.4 Connections between Lenders and Common Ownership

We look at connected executives and directors (interlocks) as a simple information transmission mechanism across lenders. Our focus on connections between lenders through directors and executives arises from the fact that, for these large-scale loans, most loan officers are directors or high-level senior executives (vice presidents or treasurers) who typically report to the board of directors: Gao et al. (2020). Directors alone account for around 12 percent of the bankers responsible for issuing loan contracts. In our sample, the median bank in our sample syndicates only 6 loans; only 12 percent of the banks arrange more than 50 loans annually.

For each pair of lead bank-potential syndicate members, we define an interlock as an indicator equal to one if: (i) at least one director or executive has an employment relationship with both banks; or (ii) at least one director or executive from each bank in the pair serves on the board of a common third firm. We also consider the total number of interlocks as an alternative measure of connections between lenders. Information on executives and directors is retrieved from BoardEx, with yearly frequency, for the period 2000-2017.[21] We then describe the probability of interlocks by regressing the indicators on a measure of common ownership and an extensive set of covariates capturing characteristics of the lender pair.

Table II presents the results of a linear probability model. We empirically document a positive relationship between common ownership and interlocks; that is, pairs of lead bank-potential syndicate members with higher levels of common ownership are more likely to exhibit interlocking executives or directors. This positive association remains significant after controlling for (i) characteristics of the lenders (their size, equity, book leverage, return on assets, and whether they belong to the S&P 500); (ii) characteristics of the lender pairs (their portfolio similarity and their past relationships); and (iii) year dummies. These results support the hypothesis that, in our setting, common ownership can constitute a communication device between firms if it is sufficiently large, as executives and directors are more likely to overlap at higher levels of common ownership.[22]

Our findings complement the work of Azar (2021), providing evidence that firms with common owners are more likely to share directors, and Nili (2020) and Eldar et al. (2025), documenting the rise of so-called horizontal directors, serving on the boards of multiple companies within the same industry.[23] Our analysis extends beyond directors to all senior executives. Of course, interlocks are only one of the possible forms of information transmis-

[21] Our common ownership measure is built at the quarter-year level. Because the information on executives is at a yearly frequency, we use the measure of common ownership from the last quarter of each year.

[22] The literature has amply documented the role of directors on the success of acquisitions (Hilscher and Şişli-Ciamarra, 2013), especially directors with investment banking experience sitting on a board of non-financial firms (Huang et al., 2014), and the implications of conflicts of interest when a bank's relationship with a borrower is affected by extra control rights (Kroszner and Strahan, 2001; Santos and Rumble, 2006; Jagannathan et al., 2020). Ferreira and Matos (2012) find that in the presence of common directors between bank-borrower pairs, the bank is more likely to be chosen as a lead arranger because of the connected bank's informational advantage over other banks.

[23] Relatedly, Bittner et al. (2024) identify syndicated-loan networks as a channel through which private information flows between financial institutions in M&A transactions.

sion between lenders in the presence of common ownership. In addition, common ownership renders such communication credible, as it aligns the parties' interests. For this reason, we will use our measures of common ownership to test the hypotheses generated by the model rather than proxies, such as interconnections, which are likely subject to measurement errors.

5 Estimation and Results

We now investigate whether the three predictions of Proposition 1 are verified in the data. For each prediction, we first present the empirical specification. We then discuss the identification strategy, highlighting the key sources of identifying variation in the data. Finally, we present the results.

5.1 Interest Rates

5.1.1 Empirical Design

According to Prediction 1 of Proposition 1, the interest rate paid to the syndicate members will be lower at higher levels of common ownership. We test the prediction by estimating the following equation:

$$Spread_{iat} = \beta_0 + \beta_1 CO_{iat} + \beta_2 X_{iat} + \varepsilon_{iat}, \tag{5}$$

where the dependent variable $Spread_{iat}$ is the all-in-drawn spread paid to syndicate members of facility i arranged by bank a in quarter t. We omit the subscript for the borrowing firm to simplify the notation. The variable of primary interest, CO_{iat}, is measured in two alternative ways: (i) CO_{ia}^{avg} the average common ownership between the lead bank and other syndicate members, as defined in Equation (2); and (ii) $CO_{ia}^{\max}$ the maximum level of common ownership between the lead arranger and any syndicate member, as defined in Equation (3). Prediction 1 translates into the prediction that the coefficient β_1 is negative when common ownership is high enough, where the threshold $\kappa \geq \underline{\kappa}$ is empirically identified in Section 5. Our estimated β's do not estimate either the parameters of the demand curve or those of the supply curve, but instead the effect of each covariate on the equilibrium outcomes.

The vector of variables X_{iat} includes an extensive set of controls related to: (i) the loan and the facility; (ii) the borrower; and (iii) the lender. We also account for relationships of common ownership between lenders and borrowers: under the lens of a vertical integration model, common ownership between lenders and borrowers may result in lower prices for the borrower as common ownership eliminates double marginalization (Chen et al., 2023) and reduces information asymmetries. This ensures that our estimates are not confounded by vertical integration effects. Other facility and loan-related controls include facility amount, the number of participants, the arranger's past relations with syndicate participants and with the borrower, the presence of collateral, the presence of non-bank institutional lenders as members (including collateralized loan obligations, CLOs), and the maturity of each facility. The rationale for using the facility amount and other non-pricing features of the loans as controls is that those characteristics are fixed before the syndication process. If we remove those controls, our estimates are essentially unchanged. We also control for the three-month LIBOR rate at origination, as the literature documents a relationship between the LIBOR rate and loan spreads (Roberts and Schwert, 2020). Borrower-related controls include the borrower's size measured in assets, profitability, and a measure of leverage defined as book debt over total assets. Finally, lenders' related variables include their size, capital, and profitability. Following Antón et al. (2023), in all our specifications, we use quintile dummies of the lender's size to address the concern that the common ownership variable may be picking up non-linear effects of the lender's size. The full set of controls X_{iat} is listed in Table B.II.

In addition to our time-varying set of controls, we employ multiple fixed effects to difference out alternative interpretations, such as confounding effects of demand and supply variations. The inclusion of fixed effects for facility type and loan purpose ensures that our results are not driven by omitted characteristics at the facility level. In our baseline specification, we also include industry-year-quarter fixed effects to control for aggregate variation in demand for syndicated loans in each sector, as well as the aggregate time-varying propensity towards risk in each sector. We, therefore, base our inferences on within-industry and year-quarter variations so as to differentiate out the fact that important events, such as the financial crisis of 2008, may have had differing impacts across industries. Borrower fixed effects account for unobserved time-invariant heterogeneity across borrowers. Finally, to capture time-invariant supply factors (for example the fact that the lead arranger may specialize in loans with specific features), we add lead bank fixed effects.

Our coefficient of primary interest (the one on common ownership) is mainly identified by the cross-sectional variation that arises from differences in the composition of the syndicate, both across facilities and across loans. Specifically, as we use year-quarter fixed effects, interacted with the industry in which the borrower operates. The coefficient is therefore identified by the within variation in common ownership among facilities and loans that differs from the average common ownership level faced by borrowers in a certain industry and period. Persistent differences in common ownership across borrowers and lead arrangers are absorbed by our fixed effects at the borrower and lead arranger level.

Our variable of interest (CO_{iat}) depends on the syndicate composition, which is endogenously determined through lenders' participation decisions. If unobserved factors, such as borrower–lender match quality or private information about borrower risk, influence both syndicate formation and loan pricing, estimates may be biased. We address this in two ways: (i) by using a rich set of fixed effects absorbing time-invariant confounders, and (ii) by estimating a formal Heckman selection model in Section 5.1.3 with exclusion restrictions.

Before presenting the coefficient estimates, we assess the importance of each source of variation. We regress our measures of common ownership (CO_{ia}^{avg} and CO_{ia}^{max}) on all the covariates included in the main specification and then partition the variance of the residual into three components: (i) variance in industry-year-quarter, borrower, lead arranger, facility type, and loan purpose; (ii) variance across loans within an industry-year-quarter; and (iii) variance across facilities within a loan. When using CO_{ia}^{avg}, we find that the first component explains around 75.0% of the total variance in common ownership: this is the portion of variance absorbed by our fixed effects and time-varying controls. Variability in common ownership across loans and facilities, after accounting for the fixed effects and the controls, accounts for 20.1% of the variance in common ownership. Only 3.9% arises from differences in common ownership attributable to variation across facilities within a loan. When using CO_{ia}^{max}, the fixed effects and controls absorb 72.6% of the variation, 22.0% is explained by variability across loans, and the remaining 5.4% is attributable to variation across facilities within a loan. This is the variation that we will exploit in the within-loan specifications (see below).

5.1.2 Panel-regression Estimates

Table III presents the estimation results for the coefficients of primary interest. Columns 1 and 2 of Table B.III in the Internet Appendix (Appendix B) report the full set of coefficient estimates. The estimated coefficient indicates that an increase of one standard deviation in common ownership CO_{ia}^{avg} is associated with a lower spread of 3.40 basis points (column 1).

To understand how price reductions vary across the range of common ownership, we discretize our common ownership measure into five indicator variables corresponding to the quintiles of its support. Column 2 of Table III shows that reductions in spread occur only at higher levels of common ownership (quintiles 4 and 5, corresponding to 40% of the facilities in our sample), and the magnitude of these reductions increases monotonically with common ownership. These results confirm the predictions proposed in Section 3; we empirically identify the threshold value of common ownership (in the model, $\underline{\kappa}$) at around 0.71. Assuming no changes in spread for the omitted category (the first quintile), the point estimates represent the average change in spread for loans in each quintile. Our results indicate that, within quintiles 4 and 5, a change in common ownership in a facility from the minimum to the maximum level reduces the price by 0.94 to 4.02 basis points. The average facility spread in quintiles 4 and 5 of common ownership is around 193 points.

Using the maximum level of common ownership $CO_{ia}^{\max}$, reported in columns 3 and 4 of Table III, yields similar results. An increase of one standard deviation in the maximum common ownership measure is associated with a lower spread of 3.18 basis points (column 3). When discretizing this ownership measure, we find that reductions in spread already appear at quintile 2. Figure B.1 in the Appendix shows that the distribution of the maximum common ownership is shifted to the right, so the value at quintile 2 (around 0.66) is close to the threshold value identified above (around 0.71).

While we focus on common ownership between lenders, common ownership between lenders and borrowers could impact loan terms as well. As hypothesized, column 1 of Table B.III shows that an increase of one standard deviation in vertical common ownership between lenders and borrowers is associated with a lower spread of similar magnitude (4.65 basis points), consistent with reduced double marginalization and information asymmetries (Ojeda, 2019).

Of course, common ownership is not the only mechanism for overcoming moral hazard and adverse selection in the syndicated loan market. We also control for the fraction of loans that the lead lender had with the same members over the preceding three years (the relationship score), and "reciprocity" in lender participation, whereby the lead and the member banks in one loan switch their roles as lead and participants in another syndicated loan; following Cai (2010), we define past reciprocity depth as the average fraction of reciprocal loans taken by the lead arranger on the 12 quarters prior to loan origination.[24] Reputation effects are captured by lead bank fixed effects.

The relationship score has a similar effect on prices as common ownership; an increase of one standard deviation in the relationship score is associated with a lower spread of 4.58

[24] Cai (2010) uses four measures of reciprocity: reciprocity existence, breadth, depth, and length. Our results are robust to all the definitions proposed by the author. We focus on reciprocity depth because this measure is most suitable in our setting and less prone to multicollinearity issues with the other covariates. We also define a reciprocity measure that is not only lender but also borrower-specific; our results hold.

basis points (column 1 of Table B.III); similarly, an increase of one standard deviation in the reciprocity depth is associated with a reduction in spread by 1.51 basis points. Our results show that common ownership complements other mechanisms that mitigate information asymmetries.

Within-loan Estimates We next focus on pricing differentials across facilities of the same type *within* a loan that exhibit varying degrees of common ownership. This constitutes our most rigorous test for borrower risk confounders, as all facilities within a loan share identical default rights. The identification strategy originates in Ivashina and Sun (2011) and was subsequently adopted by Lim et al. (2014); we operationalize it in a more stringent way with the direct use of loan fixed effects. This approach ensures that any remaining variation in spreads associated with common ownership cannot be attributed to unobserved borrower characteristics that jointly influence pricing and syndicate composition. Moreover, the choice of a specific facility is likely driven by lender-specific portfolio preferences rather than by the degree of common ownership. Because a credit event in any facility triggers default for the entire loan (we exclude loans with split control rights), facilities of the same type within a loan effectively share identical risk characteristics. We further control for residual differences across facilities in terms of type, size, and maturity that may affect pricing.

We estimate Equation (5) using $CO_{ia}^{\max}$, the maximum level of common ownership between the lead arranger and any syndicate member in a facility, which provides sufficient within-loan variation after accounting for this rich set of fixed effects. This measure is also theoretically accurate as it identifies the effect of introducing or removing the critical link that triggers information sharing within a facility. Columns 5 and 6 of Table III report the results. Consistent with our main findings, the estimates indicate that higher common ownership leads to lower spreads: an increase of one standard deviation in common ownership reduces the spread by 6.74 basis points (column 5).

Robustness The Internet Appendix (Appendix B) contains the results of several robustness tests. Our results are robust to the inclusion of different sets of fixed effects, as reported in Table B.III. In particular, in column 3, we include the interaction of lead indicators and year-quarter fixed effects (rather than the additive specification with lead bank and year-quarter fixed effects). The interaction rules out possible sorting based on unobservable variations in the risk preferences in each lead arranger; the magnitude of the common ownership coefficient is similar.

In column 4, we consider borrower-year fixed effects to control for unobserved time-varying borrower heterogeneity, where estimates indicate an even larger reduction in spread associated with high common ownership.[25]

The syndicated loan market is concentrated. JP Morgan and the Bank of America are the most active lead arrangers, with around 63% of the loans in the sample (77% in value). We repeat our analysis excluding the loans arranged by these two banks, with the results reported in column 5. The coefficient estimate of common ownership is negative, similar in magnitude, and somewhat noisier given the reduction in sample size; the result confirms the effectiveness of our controls at the lead arranger level and that the negative effect of common ownership on prices is not driven only by the two main actors in this market, but impacts the market as a whole.

In column 6, we show the results of a logarithmic specification for the dependent variable; the magnitude of the coefficient of common ownership is similar. We conclude that our results are not driven by outliers.

Our common ownership measure, mainly based on 13F filings, is most accurate for public U.S. banks, even though we construct a control for non-bank syndicate members. In column 7 of Table B.III, we restrict the sample to deals including only U.S. public banks, thus removing deals with non-banks or foreign lenders as members. Our results hold, and the coefficient of common ownership is larger in magnitude.

Finally, in column 8, we run a robustness exercise excluding all loans that contain facilities with private banks. Because the data generally do not allow us to observe the ownership structure of private banks, common ownership is measured only among public banks. While excluding all loans that contain facilities with private banks reduces the sample size, the results remain similar to those reported in the main specification of the paper.

Measures of common ownership We assess the robustness of our findings to alternative treatments of the common ownership measure along four dimensions. First, we replicate our analysis using only the holdings data of Amel-Zadeh et al. (2022) and Kasperk et al. (2024). Second, we consider different treatments of outliers (trimming vs. winsorization). Third, we employ an alternative definition of common ownership based on minimum commonly held shares. Finally, we vary the aggregation of κ_{ab_i} within a facility, from equal- to value-weighted averages.

We re-estimate the main specification (Equation 5) using only the Kasperk et al. (2024)'s

[25]Following Degryse et al. (2019), we prefer the use of year-quarter-industry fixed effects as our main specification. The use of borrower-year fixed effects implies the loss of single-period borrowers, which could bias our results.

sample (2000q4–2017q1). This dataset adjusts voting rights in multiple-class stock structures to reflect actual control rights, ensuring accurate measurement of common ownership. Table B.IV reports the results. Across specifications, the coefficients remain negative, highly significant, and of comparable magnitude to those in Table III. For example, in the baseline specification, a one–standard deviation increase in common ownership is associated with a spread reduction of 3.15 basis points (column 1). Likewise, the quintile-split results closely mirror those in Table III, with spreads declining monotonically across higher quintiles of common ownership.[26] These findings confirm that our results are not driven by parsing issues pre-2000q4 and remain robust when using only the improved holdings data of Amel-Zadeh et al. (2022) and Kasperk et al. (2024).

Following common practice, we trimmed our common ownership measure at the 1% right tail of the distribution to reduce the influence of outliers. Our conclusions are unchanged when we winsorize instead, as shown in Table B.V.

Finally, our baseline specification aggregates κ_{ab_i} using equal-weighted averages across facility members (Equation 2). We replicate the analysis with a value-weighted average, where the weights are given by the market capitalization of each syndicate member bank.[27] As shown in columns 1 and 3 of Table B.VI, the results are very similar to those in Table III. In addition, we implement an alternative definition of common ownership, computed as the average of the minimum commonly held shares between the lead arranger and the syndicate members (Newham et al., 2022). The results, reported in columns 2 and 4 of Table B.VI, continue to indicate a negative effect of common ownership on loan spreads (and the retained share). Specifically, an increase of one standard deviation in this alternative measure is associated with a reduction in spreads of 9.72 basis points.

Non-investment grade loans and common ownership Recent literature has focused on the market of non-investment grade loans, which is a rapidly growing segment characterized by originate-to-distribute loans. Pipeline risk, the risk that the loan becomes a "hung" deal, may arise when the market is unwilling to absorb the loan under the conditions arranged by the lead bank: Bruche et al. (2020). Table B.VII in the Internet Appendix (Appendix B) presents our empirical analysis that deals with pipeline risk.

First, in columns 1 and 2, we exclude from our sample non-investment grade loans. Our results hold; an increase in common ownership decreases loan prices. Second, in columns

[26] Quintile cutoffs are computed using the full sample distribution of common ownership to ensure comparability with Table III.

[27] These weights reflect the relative size of the syndicate members in the banking market, not their contractual shares in the loan facility, which are not systematically reported in Dealscan.

3 and 4, we include time-on-the-market as a control, namely the number of days from the start to completion of syndication, as a proxy for the mismatch between the loan pricing and market demand (hot or cold deals). Our results are strengthened by the inclusion of the variable; the coefficient of common ownership is larger in magnitude and significant, notwithstanding the limited sample size.

5.1.3 Common Ownership and Syndicate Participation

Our variable of interest, common ownership (CO_{iat}), depends on the syndicate composition, which is endogenously determined through lender participation decisions. If unobserved factors influence both syndicate formation and loan pricing, estimates may be biased. We extend our model to account for this form of self-selection. We assume that the utility maximization problem of potential members can be characterized by a reservation interest rate (spread) or reservation return. The reservation interest rate will depend on the characteristics of the member, along with the assessment of the riskiness of the borrower, as follows:

$$Spread^r_{iabt} = \gamma_0 + \gamma_1 \kappa_{iabt} + \gamma_2 X_{iabt} + \upsilon_{iabt}, \tag{6}$$

where i indexes the facility, a the lead arranger, b the potential syndicate member. The term κ_{iabt} is the weight that the lead arranger a puts on the profit of each potential syndicate member b in facility i arranged in quarter t, as defined in Equation (1). Finally, X_{iabt} is a vector of controls including characteristics of: (i) the potential member; (ii) the lead arranger; (iii) the loan and the facility; and (iv) the borrower. As above, since each facility i is associated with a single borrower, we omit a separate subscript for the borrowing firm to simplify notation.

If the actual interest rate offered to the potential members is below the reservation interest rate, $Spread^r_{iabt}$, the potential member does not participate in the syndicate. The participation decision of a potential member bank (p_{iabt}) is therefore:

$$\begin{aligned} p_{iabt} &= 1 \text{ if } Spread_{iat} - Spread^r_{iabt} > 0 \\ &= 0 \text{ if } Spread_{iat} - Spread^r_{iabt} \leq 0. \end{aligned}$$

Using the definition of $Spread_{iat}$ in Equation (5) and the level of common ownership between the lead bank a and each syndicate member bank in facility i (b_i), as in Equation

(1), the inequality can be expressed as follows:

$$\begin{aligned} p^*_{iabt} &= (\beta_0 - \gamma_0) + (\beta_1 \kappa_{iabt} - \gamma_1 \kappa_{iabt}) + \\ & \quad (\beta_2 X_{iabt} - \gamma_2 X_{iabt}) + (\varepsilon_{iabt} - \upsilon_{iabt}) \\ &= \delta_0 + \delta_1 \kappa_{iabt} + \delta_2 X_{iabt} + \eta_{iabt}. \end{aligned}$$

The participation equation is therefore:

$$p_{iabt} = 1[\delta_0 + \delta_1 \kappa_{iabt} + \delta_2 X_{iabt} + \eta_{iabt} > 0]. \tag{7}$$

The resulting outcome equation is:

$$\begin{aligned} Spread_{iat} &= \beta_0 + \beta_1 \kappa_{iabt} + \beta_2 X_{iabt} + \varepsilon_{iabt} \text{ if } p^*_{iabt} > 0 \\ &= \text{not observed if } p^*_{iabt} \leq 0, \end{aligned} \tag{8}$$

where we revisit Equation (5) to use a more granular unit of observation at member-facility level rather than facility level as in the main specification. The coefficient β_1 should be interpreted as the average association between a participating member's κ_{iabt} and the facility spread after correcting for selection.[28] The error term η_{iabt} involves the unobserved determinants influencing the interest rate offered to the members ε_{iabt}. To account for the correlation between unobservable drivers of participation and the resulting interest rate offered to the syndicate members, we assume a joint normal distribution for the two error terms:

$$\begin{pmatrix} \eta_{iabt} \\ \varepsilon_{iabt} \end{pmatrix} \sim N\left(0, \begin{pmatrix} 1 & \sigma_{12} \\ \sigma_{12} & \sigma_2^2 \end{pmatrix}\right).$$

We estimate the model using the standard Heckman two-step procedure. The joint normality of the errors implies that the error in the pricing equation, ε_{iabt}, is a multiple of the error in the participation decision equation (σ_{12}) plus some noise that is independent of the participation decision equation.

Identification While the sample selection model is theoretically identified without any restriction on the regressors (through nonlinearities), we strengthen identification by using exclusion restrictions to pin down the parameters through variation in the data rather than

[28]The dependent variable, $Spread_{iat}$, is set at facility level and does not vary across members of the same facility.

parametric assumptions. Specifically, we employ two variables that should affect syndicate participation but should not directly affect spreads once borrower risk and facility terms are controlled for. The first is multimarket contact between the lead and potential member banks. Hatfield and Wallen (2022) show that banks with greater multimarket contact in the deposit market are more likely to co-syndicate, due both to collusive incentives in the opaque syndicated market and to information advantages from lending network externalities (Chodorow-Reich, 2014). Importantly, this measure is not mechanically related to bank size or distance. The second exclusion variable is the geographical distance between the potential member and the lead bank, following Mian (2006). Distance directly affects monitoring costs and thus the likelihood of participation, but it should not affect spreads conditional on syndicate composition.

The measure of multimarket contact between bank a and b is defined as the *overlap of their deposits* across markets (counties, denoted by c) weighted by market concentration:

$$MMC_{a,b} = \sum_{c} \left(\theta_c^a \cdot \theta_c^b\right)^{\frac{1}{2}} \cdot HHI_c,$$

where $\theta_c^a = \frac{q_c^a}{\sum_c q_c^a}$ denotes the lead arranger bank a's deposits in market c (q_c^a) divided by the total deposits of bank a. In other words, θ_c^a is the deposit portfolio share of bank a in market c. The term HHI_c denotes the local market concentration and is defined as the sum of squared deposit shares of all banks within a county c. The first component, $\left(\theta_c^a \cdot \theta_c^b\right)^{1/2}$, captures the extent of overlapping deposits at risk of direct competition between a and b. The second component, HHI_c, scales this overlap by the profitability of those deposits, as higher concentration makes threatened deposits more valuable.

Taken together, multimarket contact and geographical distance are relevant predictors of syndicate participation and plausibly excluded from the spread equation, providing credible sources of identification. To calculate the measure of multimarket contact, we use publicly available information from the annual survey of branch office deposits conducted by the Federal Deposit Insurance Corporation. To calculate geographical distance, we use the latitude and longitude of each bank's headquarters.

Results Columns 1–2 of Table IV present the results without correcting for selection, while columns 3–6 report results using the Heckman two-step selection model. Results from the selection equation indicate that participation is not random. As expected, potential members with higher common ownership with the lead bank are more likely to join the syndicate, confirming that high levels of common ownership mitigate information asymmetries. Better-informed potential members, being more aware of investment opportunities, face a lower reservation price and are thus more likely to participate in the syndicate. Other statistically significant drivers of participation include the degree of multimarket contact (positive) and the geographic distance between the lead and the potential member (negative).

The significant sample selection term, λ, with an implied correlation coefficient of 0.63, confirms the presence of unobserved attributes positively affecting both syndicate participation and loan pricing. Nonetheless, the results with and without the selection correction remain qualitatively similar. In particular, the standardized coefficient of common ownership is close in magnitude to the one in Section 5, implying that a one standard deviation increase in common ownership reduces the loan spread by 3.55 basis points. We conclude that common ownership increases the demand for loans, which would, per se, reduce the spread through the book-building process. However, even after accounting for selection, common ownership reduces the loan spread, which is an effect that we attribute to the role of common ownership in mitigating information asymmetries between the lead arranger and members. The fact that results remain similar with and without the selection correction further suggests that the extensive set of fixed effects in our specification already captures much of the impact associated with the book-building process on prices.

Finally, column 6 reports results using the same selection equation as before but modifying the outcome equation, Equation (8), by replacing κ_{iabt} with $CO_{ia}^{\max}$, the maximum common ownership across lead–member pairs within the facility. The results remain robust.

5.1.4 Difference-in-Differences Design

To further support the causal interpretation of our estimates, we employ a strategy that is based on exogenous shocks to common ownership; following He and Huang (2017) and Lewellen and Lowry (2021), we identify 18 mergers between non-bank financial institutions. We consider those mergers plausibly exogenous shocks to lenders' common ownership, as asset managers do not directly own syndicated loans in their portfolios. By the same token, we do not consider bank mergers as the loan portfolio directly owned by financial institutions could be pivotal to the merger decision. We calculate the hypothetical increase in common ownership between lenders in the quarter before the announcement of each merger; none of those mergers generates a significant change in common ownership between lenders, except for the largest one, BlackRock's acquisition of Barclays Global Investors (BGI) in 2009. We explain below that our setting is robust to the points raised by the literature when using mergers as an exogenous shock. Lewellen and Lowry (2021) scrutinize the use of the BlackRock-BGI merger to identify firm-level effects; their main criticisms relate to the sample period (the post-merger period coincides with the financial crisis) and the differential impact of the financial crisis on control and treated groups.

As detailed by Azar et al. (2018), the history of the acquisition, with Barclays' attempt to sell to investors other than BlackRock, suggests that the deal was not driven by considerations on the combination of the portfolio of BlackRock and BGI for potential future syndicated loans and the "no anticipation" hypothesis is likely to hold.

We calculate: (i) the level of common ownership in the quarter before the acquisition was announced (2009 Q2) for each bank-pair present in our sample; (ii) the counterfactual level of common ownership for the same period where we treat the holdings of BlackRock and BGI as one entity; and (iii) the implied change in common ownership (CO delta). Similarly to Azar et al. (2018), we define as "treated" lender-pairs as those with a CO delta in the top tercile of the CO delta distribution; lender-pairs in the bottom tercile are the placebo group. Finally, we define the treatment at the facility level when more than half of the lead-member pairs in a facility are treated. We use our repeated cross-section of facilities-loans to estimate a 2×2 difference-in-differences specification:

$$Spread_{iat} = \delta_0 + \delta_1 Post_{iat} + \delta_2 Treat_{iat} + \delta_3 Treat_{iat} \times Post_{iat} + \delta_4 X_{iat} + \varepsilon_{iat}, \tag{9}$$

where $Spread_{iat}$ denotes the all-in-drawn spread paid to syndicate members of facility i arranged by bank a in quarter t, $Treat_{iat}$ equals one if the majority of lead–member pairs in facility i are treated, and zero otherwise; $Post_{iat}$ is an indicator equal to one if the loan origination quarter falls in the post-merger period. Following He and Huang (2017), the post-merger period is two years (eight quarters) after the acquisition announcement to avoid potential confounding events affecting the outcome and the ownership ties after the merger.

In the Appendix Figure B.2, we verify that the BlackRock–BGI merger does not appear to generate portfolio rebalancing around the event. BlackRock's holdings exhibit a discrete upward shift after the merger, consistent with the mechanical consolidation of the two portfolios. We do not observe anticipatory increases in BlackRock's holdings prior to the merger announcement. Figure B.3 plots the average lead–member profit weights for treated and control pairs. The two groups display stable and broadly parallel trends before the merger. After 2009q2, treated pairs experience a modest increase relative to controls, consistent with the merger shock.

Importantly, in the period before the acquisition announcement, the average spread grew from around 150 basis points between 2005 and 2007 to 209 basis points in 2008 and 360 basis points in 2009; it declined in 2010 to 293 basis points without returning to the pre-crisis level. While the post-merger period coincides with the aftermath of the crisis, the spread remains much higher than in the pre-treatment period, which would mechanically suggest a positive treatment–spread relationship, contrary to our hypothesis. This underscores the importance of the difference-in-differences framework to isolate the merger effect from the crisis shock. In addition, our identification strategy is not based on sectoral shocks because treatment and controls are defined at the bank-facility-loan level; practically all industries see the presence of loans in the treated and control groups. Differential effects on treatment versus control loans are unlikely to be contaminated by how loans granted to firms in different industries responded to the crisis. In the baseline specification, we also incorporate facility and loan-level covariates, borrower and lead arranger controls, and fixed effects for: (i) facility type, (ii) loan purpose, (iii) sector interacted with year, and (iv) lead arranger.

Finally, commonly owned banks may present different characteristics and fund different borrowers with respect to banks characterized by lower levels of common ownership. In our panel identification, we use an extensive set of controls at the loan level and fixed effects related to the lead arrangers and the borrowers. In the difference-in-differences design, we refine our analysis using the recent doubly robust difference-in-differences estimator proposed by Sant'Anna and Zhao (2020). The estimator tackles the possibility that treated and control loans may differ in observable characteristics; it is a propensity score weighting method robust to either a misspecification of the propensity score model or the outcome regression model.

We also extend the baseline specification in Equation (9), allowing year-specific heterogeneity via two-way fixed effects. The dynamic version allows us to test that pre-treatment trends in the treatment-control spread differences are absent (consistent with the parallel-trend assumption). We use the robust estimator proposed by Callaway and Sant'Anna (2021), extending Sant'Anna and Zhao (2020) to multiple periods.

The results are reported in Figure 3 and Table B.VIII; the most conservative coefficient estimates imply a reduction in the spread of treated facilities by 17 to 25 basis points; the average increase in common ownership for treated banks following the acquisition is around 3.6 percent. Figure 3, reporting the event-study plot, also shows that pre-trends are not evident (the average pre-treatment effect is small and not statistically different from zero).

5.2 Funds Committed by the Lead Bank

5.2.1 Empirical Design

Prediction 2 of Proposition 1 says that at higher levels of common ownership, information sharing between the lead bank and the members of the syndicate implies that the lead bank retains a lower share of funds for each facility in the loan. We test Prediction 2 by estimating the following equation:

$$Percent\ Lead\ Amount_{iat} = \beta_0 + \beta_1 CO_{iat} + \beta_2 X_{iat} + \varepsilon_{iat}, \tag{10}$$

where the dependent variable is the percent of facility i's amount retained by lead bank a in quarter t. The term X_{iat} includes the same extensive set of controls used in Equation (5) related to: (i) the loan and the facility; (ii) the borrower; and (iii) the lender. As before, we account for variation in facility type and loan purpose by including industry-year-quarter fixed effects to control for aggregate variation in demand for syndicated loans in each sector, and use lead bank fixed effects to capture time-invariant supply factors. As before, we use two alternative measures of CO_{iat}: (i) the average common ownership between the lead bank and other syndicate members, as defined in Equation (2); and (ii) the maximum level of common ownership between the lead arranger and any syndicate member, as defined in Equation (3).

Information on the share retained by the lead arranger is available for only half of the facilities in our sample. Blickle et al. (2020), using an alternative database, document that, for 12% of all loans, the lead arranger sells the entire share within four months, while the average loan duration is four years. These sales are concentrated among term B loans (48%) and leveraged loans (41%). Moreover, in the DealScan data, the retained share is missing not at random. In particular, reported shares at origination tend to under-represent loans for which the lead arranger sales occur (4% in this sample).

We address both challenges in our empirical analysis. First, we exclude all term B and leveraged loans; for those loans, the lead share at origination may not be a good measure for the lead arranger's exposure to the borrower over the loan's duration. The exclusion of leveraged loans also allows us to address pipeline risk. Most of the literature notes that lead arrangers hold larger shares in loans provided to opaque borrowers to avoid adverse selection and mitigate moral hazard; instead, for originate-to-distribute loans, loan retention could be the result of a "hung" deal, which may happen when the market is not willing to absorb the loan under the conditions arranged by the lead bank: Bruche et al. (2020).

Second, we implement Blickle et al. (2020)'s approximation method to compute estimates of the post-origination loan shares held by the lead arranger. The method applies to reported and missing shares using Dealscan information; it addresses both selection bias in reporting and the informativeness of the reported shares.

5.2.2 Coefficient Estimates

Prediction 2 implies that β_1 is negative. Table V presents the coefficient estimates of Equation (10): columns 1 and 4 of Table V report the effect of our common ownership measure on the share of loan retained by the lead bank without controlling for the issue of selection and misreporting; columns 2 and 5 report the effect excluding all term B and leveraged loans from the sample; and columns 3 and 6 report the effect computing the share of loan retained by the lead bank using Blickle et al. (2020)'s approximation method. Table B.IX in the Internet Appendix (Appendix B) reports the full set of coefficient estimates.

The coefficient estimates of our preferred specifications (columns 3 and 6) indicate that an increase of one standard deviation in the average common ownership implies a 0.30 percentage point decrease in the amount retained by the lead bank, holding all other variables constant at their mean values. An increase of one standard deviation in the maximum level of common ownership between the lead arranger and any syndicate member in facility i implies a larger effect, that is, a 0.78 percentage point decrease in the amount retained by the lead bank. Lead arrangers retain, on average, 14.6% of the facility amount (using the approximation method).

5.3 Lead arrangers' capacity constraints

5.3.1 Empirical Design

Prediction 3 from Proposition 1 states that lead banks that commit more funds to loans with low common ownership subsequently face tighter liquidity/capacity constraints, reducing their ability to underwrite new syndicated loans.

Let $w_{a,t}$ denote the intensity of lending relationships for a lead bank a in quarter t, measured as the dollar amount of loans underwritten by the lead bank (lead bank market allocation) divided by total market allocations in quarter t. Let $w^L_{a,t-1}$ be the analogous lending intensity for loans with low common ownership, defined as facilities where the common-ownership measure lies below the fourth quintile.

We test the prediction by estimating the following dynamic-panel specification looking at the impact of lead-bank commitments in low common-ownership loans in one period on subsequent lending behavior:

$$w_{a,t} = \beta_0 + \beta_1 w_{a,t-1} + \beta_2 w^L_{a,t-1} + \beta_3 X_{a,t} + \mu_a + \mu_t + \varepsilon_{a,t}. \tag{11}$$

A negative coefficient β_2 would support the prediction that higher commitments to low common-ownership loans (which require the lead bank to retain a larger share) reduce lending in the subsequent period due to tighter liquidity constraints.

The vector $X_{a,t}$ includes lead-bank control (bank size, market value of equity capital, book leverage, profitability, and a measure of the portfolio distance between the lead bank and the syndicate participants in the previous four quarters as in Cai et al. (2018)), as well as the 3-month LIBOR rate to control for temporal variation in monetary conditions (which we treat as exogenous) and year fixed effects (μ_t) to capture time-specific shocks. Lead bank fixed effects (μ_a) account for time-invariant bank heterogeneity.

To address endogeneity in the lagged dependent variable ($w_{a,t-1}$) and the low common-ownership lending intensity ($w^L_{a,t-1}$), we employ the Arellano–Bover/Blundell–Bond system-GMM estimator (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998).[29] Exogenous variables, used as standard instrumental variables, include a lead bank control for multimarket contact, as described in Section 5.1.3, and the 3-month LIBOR rate. Year dummies are also included as exogenous instruments.

5.3.2 Coefficient Estimates

Table VI reports the estimation of Equation (11) using the two-step system-GMM estimator with collapsed instruments (lags 3 and 4).

In all specifications, the autoregressive term is persistent, reflecting dynamics in lead-bank lending intensity. Most interestingly, the coefficients on lagged lending intensity with low common ownership are negative, suggesting that a higher commitment to low common-ownership loans in the previous period significantly reduces current lending intensity. This negative and statistically significant estimate aligns with the hypothesis that retaining a larger share of such loans imposes capacity constraints. Based on the standard deviation of $w^L_{a,t-1}$ (0.046) and the mean of $w_{a,t}$ (0.035), a one standard deviation increase in lagged low common-ownership lending intensity reduces current lending intensity by 0.016 (approximately 46% of the mean of $w_{a,t}$) in the short run.[30]

[29]Bank-level controls are treated as endogenous as well, instrumented using their own lagged values.

[30]Standard errors are robust and adjusted for small-sample bias. Using the Arellano-Bond tests up to

6 Additional Results

Our findings are consistent with the predictions of the theoretical model in Section 3. In this section, we conduct additional tests whose results confirm our theory.

6.1 New Versus Repeated Borrowers

In our analysis, we have so far considered the overall effect of common ownership on the financing terms of syndicated loans. We expect that the role of common ownership will be stronger when information asymmetries are pronounced. Following Sufi (2007), we consider the reputation of borrowers, measured by their past access to the loan market, as a proxy of heterogeneity in information asymmetry between the informed lead arranger and the uninformed syndicate members.

Table VII reports the results of regressing the all-in-drawn spread against the common ownership measure for the subsamples of new borrowers and repeated borrowers. We find that common ownership matters only for borrowers whose reputation is less established. Those borrowers have practically no history in the loan market; thus, the lead arranger carrying out the due diligence will be more likely to hold an informational advantage over the uninformed syndicate participants. For borrowers forming new relationships with the lead arrangers in the market, we find statistically significant decreases in the top quintile. Within the fifth quintile, an increase in common ownership from the minimum to the maximum level implies a 5.94 reduction in spread. In contrast, common ownership does not appear to impact the spread of repeated borrowers.

6.2 Falsification Test: Common Ownership Member-Lead

We now present a falsification test that leverages the testable implications of our hypothesis that common ownership operates as a channel for information transmission *from* the lead arranger *to* syndicate members. The test exploits the asymmetry in our measure of common ownership between pairs of banks; that is, lead-member κ_{ab_i}, and member-lead $\kappa_{b_i a}$. As discussed in Backus et al. (2021b), any difference in the value of these two measures is driven by differences in relative investor concentration.[31] Such asymmetry is a feature of

order 3, we verify the absence of serial correlation in the differenced residuals beyond order 1. The Hansen test of overidentifying restrictions fails to reject instrument validity.

[31] In the Internet Appendix (Appendix B), we provide a decomposition of the profit weights member-lead into cosine similarity and relative lender concentration: see Equation (4). Figure B.4 shows the results. Panel (a) shows that the cosine similarity member-lead is identical to the lead-member, as reported in Figure 2.

our common ownership measure and results in the following testable implication: since only the lead arranger holds superior information on the borrower, the level of common ownership *from* the syndicate member *to* the lead arranger ($\kappa_{b_i a}$) should not impact the lending conditions once we control for the weight that the lead arranger puts on the profit of the syndicate member (κ_{ab_i}).

This test also helps rule out pipeline risk as an alternative explanation. Under the demand-discovery model of Bruche et al. (2020), common ownership could transmit market information to the lead bank. In that case, member-to-lead common ownership would matter as much as lead-to-member, contrary to what we find.

We estimate Equation (5) by regressing the all-in-drawn spread on our two measures of common ownership between the lead arranger and syndicate members in a facility (CO_{ia}), as in Equations (2) and (3), and two measures of the common ownership between *syndicate members* and *the lead arranger* in a facility (CO_{ib}): the average common ownership between syndicate members and the lead arranger, and the maximum common ownership between syndicate members and a lead arranger. The expectation is that adding CO_{ib} should not impact the lending conditions. Table VIII shows the results: in all specifications, the magnitude of the coefficient of our measures of common ownership lead-member (CO_{ia}) is practically unchanged. Most importantly, the coefficient of common ownership member-lead (CO_{ib}) is not statistically different from zero.

7 Conclusion

We study the impact of common ownership in the syndicated loan market, focusing on the connection between the lead bank and the syndicate members. Our hypothesis is that sufficiently high common ownership facilitates the transmission of private information about borrowing firms from the lead bank to the other syndicate members, thereby mitigating information asymmetries in financial intermediation.

We propose a signaling model in which a lead bank has private information on the riskiness of a project while seeking funding to finance it. In the absence of common ownership, the lead bank must signal borrower quality by retaining a larger share of the loan, a costly commitment that tightens its balance-sheet capacity. With sufficiently high common ownership, however, the lead bank can credibly transmit private information without costly retention, thereby relaxing capacity constraints. The model delivers three empirical predictions: when

Panel (b) depicts the relative concentration of lenders in the measure of common ownership member-lead, which differs from Panel (c) of Figure 2.

common ownership is sufficiently high, (i) the interest rate paid to the syndicate members is lower; (ii) the lead bank retains lower funds; and (iii) liquidity constraints at issuance are relaxed, increasing the lead bank's capacity to arrange new loans.

We use data on the syndicated loan market to empirically verify these predictions and find empirical support for all of them. In panel regressions, a one–standard deviation increase in common ownership reduces spreads by 3 to 4 bps on average, with effects concentrated at the upper end of the distribution. Within-loan estimates, which exploit variation in syndicate composition across facilities of the same loan while holding borrower risk constant, indicate that a one–standard deviation increase in common ownership reduces spreads by about 6.7 bps. Higher common ownership also reduces the lead bank's retained share: a one–standard deviation increase in common ownership lowers the retained amount by 0.3 to 0.8 percentage points; the average retained share is 14.6%. Finally, we show that common ownership mitigates lead arrangers' capacity constraints. A one–standard deviation increase in lagged low common-ownership lending intensity reduces current lending intensity by about 46% of its mean value, consistent with tighter liquidity when retention is higher.

Regulators acknowledge that common ownership can facilitate the transmission of information about the borrower. We provide empirical evidence consistent with the presence of this flow of information and quantify the impact of common ownership on the contractual terms of the loan.

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Tables and Figures

Table I: **Summary statistics**

	Mean	Std.Dev	p25	p50	p75	Obs.
			Facility Variables			
All-in-Drawn Spread	188.684	122.039	100.000	175.000	250.000	38,496
CO^{avg}	0.657	0.217	0.520	0.699	0.817	38,631
CO^{max}	0.878	0.279	0.721	0.967	1.079	38,631
CO Bank-Borrower	0.387	0.339	0.000	0.403	0.688	38,519
Facility Amount $M	615.297	1175.420	122.000	300.000	700.000	38,631
Retained Lead Amount (%)	19.375	15.177	9.167	14.000	25.000	12,195
# Facilities within Loan	1.860	1.073	1.000	2.000	2.000	38,631
Log Maturity	3.828	0.593	3.638	4.094	4.094	37,958
Secured Loan	0.492	0.500	0.000	0.000	1.000	38,631
Refinancing	0.694	0.461	0.000	1.000	1.000	38,631
Log Number of Members	2.098	0.714	1.609	2.079	2.565	38,631
Guarantor	0.100	0.301	0.000	0.000	0.000	38,631
Relationship Score	0.038	0.019	0.030	0.036	0.044	38,631
Reciprocity	0.278	0.402	0.078	0.186	0.377	38,572
New Lending Relation	0.520	0.500	0.000	1.000	1.000	38,631
LIBOR 3M	0.025	0.023	0.003	0.013	0.051	38,631
Non-Bank Synd. Member	0.225	0.418	0.000	0.000	0.000	38,631
Credit Line	0.675	0.468	0.000	1.000	1.000	38,631
Term Loan	0.325	0.468	0.000	0.000	1.000	38,631
			Borrower-Year Variables			
Size	7.344	1.637	6.216	7.258	8.394	15,424
ROA	0.072	2.424	0.054	0.089	0.130	15,397
Book Leverage	0.332	0.970	0.168	0.291	0.435	15,381
Tangibilities	0.319	0.240	0.128	0.254	0.463	15,374
Tobin's Q	1.858	6.121	1.183	1.498	2.017	13,765
Prob. Default	0.036	0.143	0.000	0.000	0.000	12,272
Stock Volatility	0.417	0.205	0.281	0.372	0.496	12,849
Log Int. Cov.	2.213	1.165	1.471	2.039	2.745	14,421
Liquidity Ratio	0.079	0.102	0.014	0.041	0.106	15,411
Unrated Borrower	0.455	0.498	0.000	0.000	1.000	15,657
High Yield	0.269	0.443	0.000	0.000	1.000	15,657
Investment Grade	0.277	0.447	0.000	0.000	1.000	15,657
			Lead-Year Variables			
Lead Size	11.650	1.429	10.744	11.534	12.577	698
Lead Market Equity	0.148	0.117	0.086	0.129	0.177	698
Bank Book Equity	0.088	0.070	0.065	0.080	0.097	698
Lead Book Leverage	0.258	0.181	0.137	0.212	0.294	695
Lead ROA	0.010	0.025	0.007	0.011	0.013	698

The table reports summary statistics of the main variables in our sample related to (i) facilities and loans; (ii) borrowers; (iii) lead banks. CO denotes common ownership. All variables are defined in Table B.II in the Internet Appendix.

Table II: **Board connections and common ownership**

	(1) Connect (0/1)	(2) Connect (0/1)	(3) Connect Total	(4) Connect Total
CO	0.227***	0.0790***	0.720***	0.263***
	(7.61)	(3.01)	(5.24)	(2.66)
Portf. Distance Lead-Member		-0.174***		-0.528***
		(-4.88)		(-3.92)
Relationship Lead-Member		0.251***		0.996***
		(6.52)		(5.45)
Lead Size		0.0766***		0.324***
		(7.85)		(6.95)
Lead Market Equity		-0.203***		-0.425***
		(-5.35)		(-3.09)
Lead Book Leverage		-0.0489		-0.227
		(-1.15)		(-1.41)
Lead ROA		-0.0679		-0.278
		(-1.50)		(-1.64)
Member Size		0.0706***		0.212***
		(6.89)		(5.69)
Member Market Equity		-0.0270		0.0266
		(-0.58)		(0.17)
Member Book Leverage		-0.0127		0.0731
		(-0.30)		(0.51)
Member ROA		-0.0835		-0.311
		(-1.57)		(-1.45)
Member S&P 500		-0.0196		-0.154**
		(-1.00)		(-2.38)
Member Top 4		0.0342		0.373**
		(0.92)		(2.11)
Year FE	No	Yes	No	Yes
Observations	10,918	10,639	10,918	10,639
Adjusted R-squared	0.0215	0.176	0.0161	0.184

The table reports the OLS regression parameter estimates and t-statistics. The dependent variable is as an indicator equal to one if a pair of banks have a board connection. The coefficient of interest is the one of CO, a measure of common ownership between each lead-member pair. Portf. Distance Lead-Member is the portfolio distance between the lead bank and the syndicate participant in the previous four quarters as in Cai et al. (2018), Relationship Lead-Member is the number of loans arranged by the lead bank where the member bank participated in the previous four quarters divided by the number of loans arranged by the lead bank in the previous four quarters. Standard errors are clustered by lead-member bank pairs. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Table III: **Interest rates**

	(1)	(2)	(3)	(4)	(5)	(6)
CO^{avg}	-15.64***					
	(-5.52)					
CO^{avg} Quintile 2		1.251				
		(0.62)				
CO^{avg} Quintile 3		-3.584				
		(-1.46)				
CO^{avg} Quintile 4		-7.859***				
		(-3.41)				
CO^{avg} Quintile 5		-10.05***				
		(-4.89)				
$CO^{\max}$			-11.42***		-24.18**	
			(-3.93)		(-2.57)	
$CO^{\max}$ Quintile 2				-6.387**		-22.96***
				(-2.09)		(-3.67)
$CO^{\max}$ Quintile 3				-8.410***		-13.95
				(-3.06)		(-1.64)
$CO^{\max}$ Quintile 4				-7.506***		-18.81**
				(-2.77)		(-2.49)
$CO^{\max}$ Quintile 5				-13.26***		-29.88***
				(-5.15)		(-3.88)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes	No	No
Borrower FE	Yes	Yes	Yes	Yes	No	No
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes	No	No
Loan FE	No	No	No	No	Yes	Yes
Observations	25,975	25,975	25,975	25,975	29,314	29,314
Adjusted R-squared	0.794	0.794	0.794	0.794	0.918	0.918

The table reports OLS regression estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). For each measure, we also show quintile indicators. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table IV: **Interest rates: selection into the syndicate**

	No Selection		Heckman Selection			
	(1) Spread	(2) Spread	(3) Member	(4) Spread	(5) Member	(6) Spread
CO	-13.027***		0.136***	-12.478***	0.136***	
	(-6.847)		(2.881)	(-11.100)	(2.881)	
$CO^{\max}$		-10.470***				-10.047***
		(-7.229)				(-9.672)
MMC			1.988***		1.988***	
			(2.957)		(2.957)	
$MMC > 0$			-0.121***		-0.121***	
			(-3.027)		(-3.027)	
log(distance)			-0.046***		-0.046***	
			(-6.641)		(-6.641)	
λ			36.665***		37.969***	
			(9.567)		(9.930)	
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
SIC2 FE	Yes	Yes	Yes	Yes	Yes	Yes
Member FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	79,446	79,694	75,801	75,801	75,801	75,801

The table reports regression estimates and t-statistics of a one-step OLS estimation of Equation (8) (Columns 1–2) and a two-step Heckman selection estimation combining Equation (7) and Equation (8) (Columns 3–6). The dependent variable in the outcome equation is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) CO between the lead and potential member bank, as defined in Equation (1), and (ii) maximum CO across member banks in the outcome equation, as defined in Equation (3). MMC denotes the multi market contact measure (Hatfield and Wallen, 2022) and distance the geographic distance. Standard errors are clustered by member bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Table V: **Facility amount retained by the lead bank**

	(1) Lead Amount Dealscan	(2) Exclude Term B And Leveraged	(3) Lead Amount Approximated	(4) Lead Amount Dealscan	(5) Exclude Term B And Leveraged	(6) Lead Amount Approximated
CO^{avg}	-2.476**	-2.858*	-1.396***			
	(-2.35)	(-1.87)	(-3.29)			
CO^{max}				-4.429***	-3.505***	-2.770***
				(-2.85)	(-3.11)	(-6.07)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	No	Yes	Yes	No	Yes
SIC2 $\times$ Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,955	2,839	24,601	7,955	2,839	24,601
Adjusted R-squared	0.806	0.806	0.783	0.806	0.807	0.784

The table reports OLS regression estimates and t-statistics of Equation (10). The dependent variable is the percentage facility amount retained by each lead bank in the syndicate. The coefficients of interest are those on two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). Columns (1) and (4) reports the baseline specification. Columns (2) and (5) excludes Term B and Leveraged loans. Column (3) and (6) replicates the baseline using the amount retained by the lead arranger computed following Blickle et al. (2020)'s approximation method. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table VI: **Lead arrangers' capacity constraints**

	(1)	(2)	(3)
$w_{a,t-1}$	1.210***	0.925***	0.957***
	(18.230)	(9.325)	(8.705)
$w^L_{a,t-1}$	-0.365**	-0.336**	-0.354**
	(-2.450)	(-2.099)	(-2.051)
Bank Size		0.008	0.005
		(1.041)	(0.727)
Bank Market Equity		-0.021	-0.055
		(-0.680)	(-1.450)
Bank Book Leverage		0.001	0.007
		(0.028)	(0.308)
Bank ROA		0.031	0.046
		(0.378)	(0.581)
Portf. Distance Lead-Member$_{avg}$			-0.005
			(-0.956)
LIBOR 3M			0.063
			(0.874)
Year FE	Yes	Yes	Yes
Obs	1,820	1,820	1,820
AR(1) z	-2.369	-2.341	-2.368
AR(1) p	0.018	0.019	0.018
AR(2) z	0.791	0.672	0.672
AR(2) p	0.429	0.502	0.502
AR(3) z	0.146	0.117	0.128
AR(3) p	0.884	0.906	0.898
Hansen χ^2	5.961	13.748	11.827
Hansen p	0.428	0.469	0.692

The table reports dynamic system-GMM estimates and t-statistics of Equation (11). The dependent variable is the lead bank's lending intensity, $w_{a,t}$, measured as the share of syndicated loan underwriting allocated to bank a in quarter t. The key independent variable is lagged lending intensity in low common-ownership loans, $w^L_{a,t-1}$, defined as the share of underwriting allocated to bank a in facilities where the common-ownership measure is below the fourth quintile. Control variables include bank size, equity, book leverage, profitability, 3-month LIBOR, and the average portfolio distance between the lead bank and the syndicate participant in the previous four quarters as in Cai et al. (2018), Portf. Distance Lead-Member$_{avg}$. All specifications include year fixed effects. Lead-bank effects are accounted for in the System-GMM columns via the transformation. System-GMM estimates use two-step estimation with collapsed instruments (lags 3 and 4). Standard errors are robust and adjusted for small-sample bias. AR tests up to order 3 confirm the absence of higher-order serial correlation in first differences, and Hansen tests do not reject instrument validity. All control variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table VII: **Interest rates and common ownership - new versus repeated borrowers**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	New Borrower				Repeated Borrower			
CO^{avg}	-25.17***				-5.723			
	(-4.16)				(-1.29)			
CO^{avg} Quintile 2		-1.915				-2.525		
		(-0.49)				(-0.71)		
CO^{avg} Quintile 3		-3.783				-5.171		
		(-0.78)				(-1.56)		
CO^{avg} Quintile 4		-4.648				-6.892*		
		(-1.23)				(-1.77)		
CO^{avg} Quintile 5		-14.50***				-4.477		
		(-3.32)				(-1.28)		
$CO^{\max}$			-16.19***				-1.478	
			(-3.15)				(-0.38)	
$CO^{\max}$ Quintile 2				-0.731				-2.542
				(-0.25)				(-0.87)
$CO^{\max}$ Quintile 3				-6.397				-1.762
				(-1.36)				(-0.52)
$CO^{\max}$ Quintile 4				-9.667**				-1.711
				(-2.30)				(-0.55)
$CO^{\max}$ Quintile 5				-19.77***				-4.574
				(-3.94)				(-1.23)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,743	12,743	12,743	12,743	13,096	13,096	13,096	13,096
Adjusted R-squared	0.744	0.744	0.744	0.744	0.750	0.750	0.750	0.750

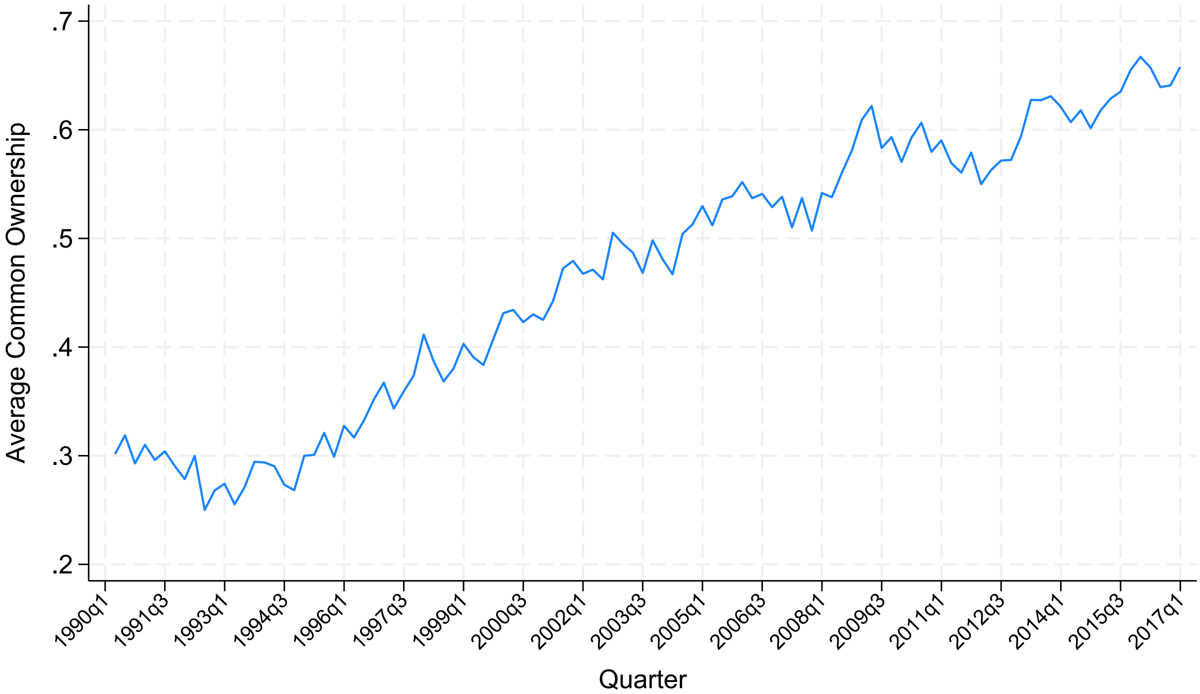
The table reports OLS regression estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). Columns (1)–(4) report results for loans issued to new borrowers, while Columns (5)–(8) report results for repeated borrowers. For each borrower group, we present baseline regressions and specifications using quintile indicators. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table VIII: **Falsification test: common ownership member-lead and lead-member**

	(1)	(2)	(3)	(4)	(5)	(6)
CO^{avg} Member-Lead	-3.276	-2.429	-3.430	-4.138		
	(-0.50)	(-0.37)	(-0.53)	(-0.65)		
CO^{max} Member-Lead					-1.132	-0.822
					(-0.22)	(-0.16)
CO^{avg}	-15.60***					
	(-4.97)					
CO^{avg} Quintile 2		1.498				
		(0.76)				
CO^{avg} Quintile 3		-3.329				
		(-1.35)				
CO^{avg} Quintile 4		-7.617***				
		(-3.26)				
CO^{avg} Quintile 5		-9.829***				
		(-4.59)				
CO^{max}			-11.55***		-11.21***	
			(-3.85)		(-4.05)	
CO^{max} Quintile 2				-6.329**		-6.287**
				(-2.08)		(-2.05)
CO^{max} Quintile 3				-8.347***		-8.208***
				(-3.02)		(-3.03)
CO^{max} Quintile 4				-7.558***		-7.395***
				(-2.75)		(-2.80)
CO^{max} Quintile 5				-13.38***		-13.10***
				(-4.96)		(-5.24)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes	Yes	Yes
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,925	25,925	25,925	25,925	25,925	25,925
Adjusted R-squared	0.794	0.794	0.794	0.794	0.794	0.794

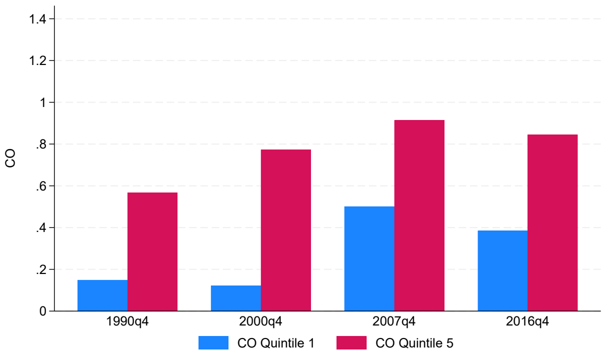
The table reports OLS regression estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3), as well as those on *CO Member-Lead*, measuring common ownership between a syndicate member and the lead in the same facility. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure 1: **Average common ownership in the syndicated loan industry over time**

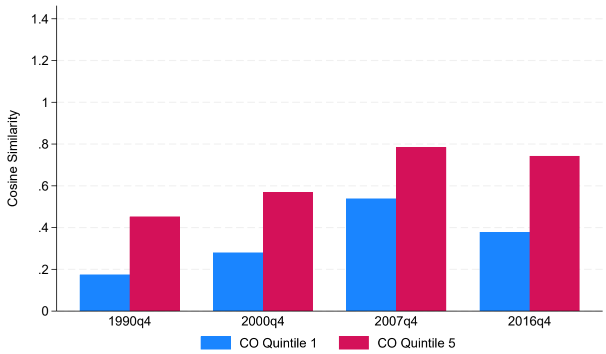


This figure reports the average common ownership among banks in the same syndicate between 1990 and 2017q1 at a quarterly frequency. Common Ownership is defined as the average profit weights between the syndicate lead-arranger(s) and the syndicate members.

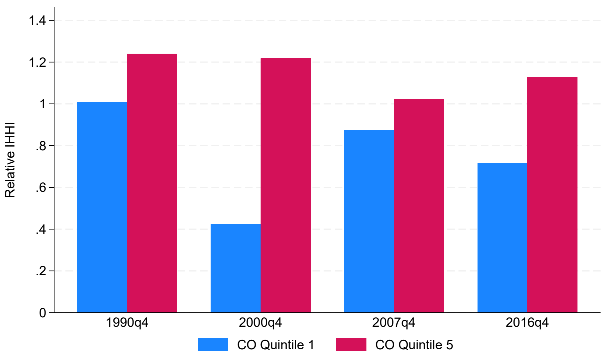
Figure 2: **Decomposition of lead-member common ownership measure**



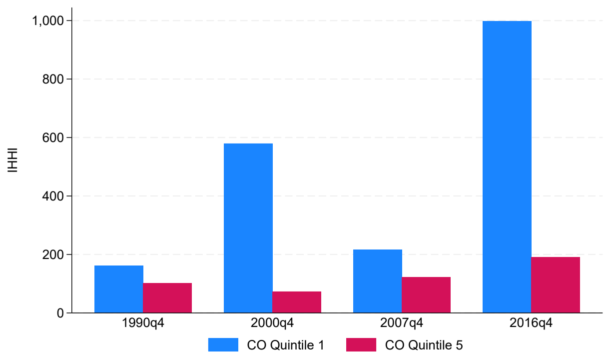
(a) CO



(b) Cosine Similarity



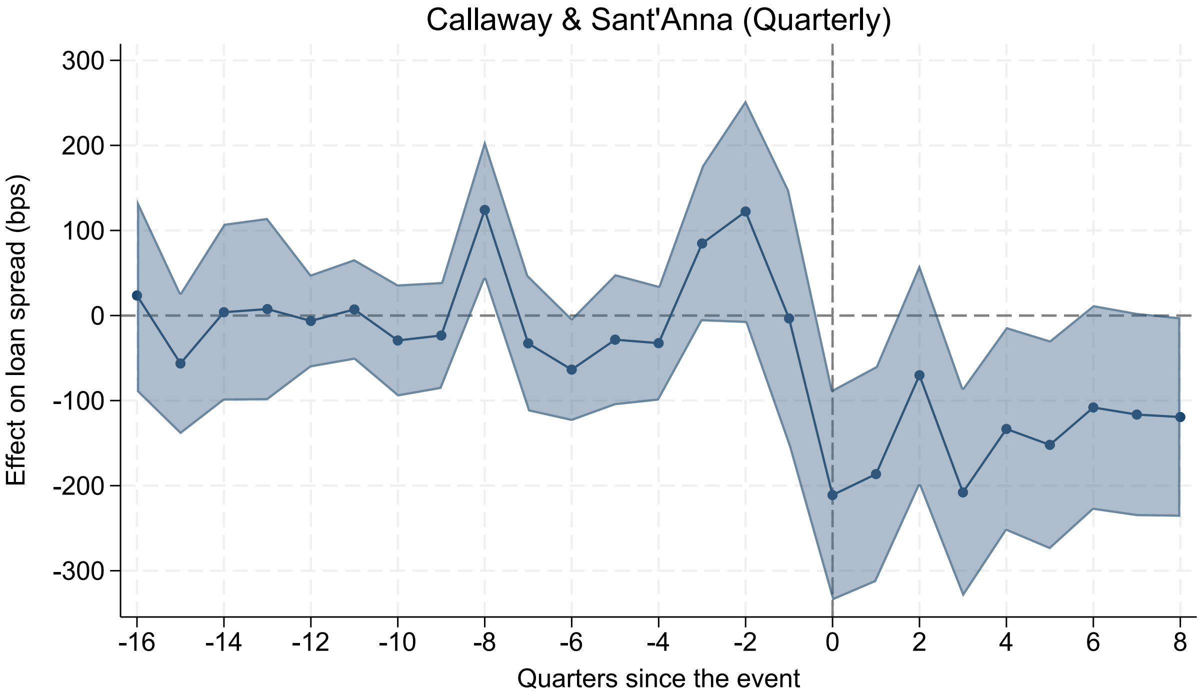
(c) Relative IHHI



(d) Lead IHHI

The figure reports the average values of syndicate common ownership (a) and its decomposition (b) and (c) for the highest and lowest quintile of the common ownership distribution over time. Syndicate common ownership (CO) is defined in Equation 2 and the decomposition in Equation 4. Panel (d) reports the average shareholders' concentration of lead banks (Lead IHHI) for the highest and lowest quintile of the common ownership distribution over time.

Figure 3: **Dynamic treatment effects of BlackRock–BGI acquisition on interest rates**



This figure reports the dynamic estimates from the difference-in-differences estimator of Callaway and Sant'Anna (2021), extending Sant'Anna and Zhao (2020) to multiple periods. The dependent variable is the all-in-drawn loan spread, expressed in basis points. The x-axis measures quarters relative to the merger announcement event (2009Q2). Coefficient estimates are plotted with 95% confidence intervals; standard errors are clustered at the lead-bank level.

Internet Appendix

Appendix A

In this section, we present the formal details of the model and solve the results we present in Section 3.

Recall that the economy is populated by a penniless borrower who owns a project but lacks the financial resources to carry it out. The borrower delegates the lead bank (L) to form a syndicate for a loan of size 1; it then shares with the lead bank the returns of the investment. A continuum of potential syndicate members (M) operate in perfectly competitive financial markets and have the financial resources to fund the project. A, with $0 < A < 1$, is the maximum loan amount the lead bank can pledge.

The borrower's project can be one of two types. The good type (G) has a probability of success equal to p. The bad type (B) has a probability of success $q < p$. Independently of the type, the project yields R in the case of success and 0 in the case of failure. The lead bank knows the type of the borrower's project. We denote by α and $(1-\alpha)$ the potential syndicate members' prior probabilities that the borrower's project is of type G and type B, respectively.

We make the following parametric assumptions.

Assumption 1.

$$pR > 1 > 1 - A > qR, \tag{A.1}$$

$$qR - A > \frac{q}{p}\left(\frac{1-\kappa\theta qR}{1-\kappa\theta}\right). \tag{A.2}$$

In Assumption 1.(A.1), $pR > 1$ implies that the good borrower's project has a positive net present value (NPV). $1 - A > qR$ means that the bad borrower's project has a negative NPV despite the use of the lead bank's funds A. At the right-hand side of the condition in Assumption 1.(A.2), parameter $\kappa \in [0, 1]$ captures the weight that the lead bank attaches to the utility of the fraction $\theta \in (0, 1)$ of commonly owned syndicate members. On the left-hand side, $qR - A$ is the project return of a lead bank representing a bad type (qR), net of the "inside liquidity" A. The condition implies that the value of such net utility is large, which, as we will see, makes signaling the good type particularly costly for the lead bank. Taken together, Assumptions 1.(A.1) and 1.(A.2) imply that $0 < A < 1/2$ and an upper bound on θ. Both are satisfied in our data.

All agents are risk neutral, the lead bank is protected by limited liability, and the risk-free interest rate is nil. The contract we consider is $(x_j, R^s_{j,L}, R^f_{j,L}, R^s_{j,M}, R^f_{j,M}, \mathcal{A}_j)$, with

$j \in \{G, B\}$. We denote by $x_j \in [0, 1]$ the decision on whether a lead bank representing a borrower of type j receives funding by the potential syndicate members. The share of the returns on a project of type $j = G, B$ received by $i = L, M$ in the case of success (s) is $R^s_{j,i}$, it is $R^f_{j,i}$ in the case of failure (f). We assume for simplicity that $R^f_{j,L} = 0$; $R^f_{j,M} = 0$ follows from limited liability. Finally, $\mathcal{A}_j \leq A$ is the amount of cash invested by L in the loan. Suppressing the notation for success, the contract can be rewritten as $(x_j, R_{j,L}, R_{j,M}, \mathcal{A}_j)$, with $j \in \{G, B\}$.[32]

L holds all the bargaining power. It designs contracts that can be accepted or rejected by M. When indifferent, L will prefer not to commit any cash in the loan (i.e., $\mathcal{A}_j = 0$). We will analyze the perfect Bayesian equilibrium of the contract design game. We use $\kappa \in [0, 1]$ to denote the level of common ownership between the lead bank and the syndicate member, where κ is the weight that the lead bank L places on the utility of the commonly owned syndicate members. Similarly to Antón et al. (2023), we restrict κ within values in the unit interval. However, values of κ larger than one are empirically possible: they correspond to situations in which the lead bank places more weight on the utility of the commonly owned syndicate members than its utility. Consequently, the lead bank would be incentivized to transfer its funds to the syndicate members.

To begin with, we solve a funding game without common ownership ($\kappa = 0$). We then introduce common ownership. In our model, the lead bank uses common ownership to truthfully channel its private information regarding the borrower's probability of success to the commonly owned syndicate members. We derive empirical predictions on the interest rate paid to the syndicate members ($1 + r = R - R_{j,L}$) and the amount of the loan retained by the lead bank ($\mathcal{A}_j$).

Before continuing, it is important to note that, with symmetric information, the lead bank rejects the loan to the bad type ($x_B = 0$) and grants the loan to a good type ($x_G = 1$). Moreover, it does not pledge its funds in the loan to the good type ($\mathcal{A}_G = 0$), and sets the reward to investors so to satisfy their break-even condition ($R_{G,M} = 1/p$). If these symmetric-information contracts were available under asymmetric information, a lead bank representing a bad borrower mimics the good borrower and its utility would be positive (because $pR - 1 > 0$). However, the syndicate members would not break even in expectation.[33]

[32] $R_{j,L}$ is then split between the lead bank and the borrower according to a bargaining game that is outside the model.

[33] Upon accepting, and given their priors, investors' expected utility is $\alpha p(1/p) + (1 - \alpha)q(1/p) < 1$ because of Assumption 1.(A.1).

A.1 Funding Without Common Ownership

We now solve the contract design game without common ownership. As discussed in the main text, we focus on the *low-information-intensity* optimum of the contract design game (Rothschild and Stiglitz, 1976; Wilson, 1977).

Proposition 2. *Without common ownership, the separating contracts offered by the lead bank are* $(x_B, R_{B,L}, R_{B,M}, \mathcal{A}_B) = (0, 0, 0, 0)$ *and*

$$(x_G, R_{G,L}, R_{G,M}, \mathcal{A}_G) = (1, A/q, R - A/q, A).$$

Only the lead bank representing the good borrower chooses $(x_G, R_{G,L}, R_{G,M}, \mathcal{A}_G)$.

Proof. We solve for the separating allocation featuring a contract $c = (x_G, R_{G,L}, R_{G,M}, \mathcal{A}_G)$ for the good borrower and the symmetric information contract $\bar{c} = (x_B, R_{B,L}, R_{B,M}, \mathcal{A}_B) = (0, 0, 0, 0)$ for the bad borrower. Contract c will maximize the good borrower's utility subject to M breaking even for the good borrower and to the bad borrower not preferring c to $\bar{c}$. Under a condition equivalent to Assumption 1.(A.1), Tirole (2006) Lemma 6.2 proves that this separating allocation is the low-information-intensity optimum. In what follows, we construct the low-information-intensity optimum in our setting.

Contract c solves the following maximization problem:

$$\max_{\{x_G, R_{G,L}, R_{G,M}, \mathcal{A}_G\}} x_G p R_{G,L} - \mathcal{A}_G \tag{A.3}$$

subject to

$$x_G(pR_{G,M} - 1) + \mathcal{A}_G \geq 0, \tag{A.4}$$

$$x_G q R_{G,L} - \mathcal{A}_G \leq 0, \tag{A.5}$$

$$R = R_{G,L} + R_{G,M}, \tag{A.6}$$

$$x_G \in [0, 1], \; \mathcal{A}_G \leq A. \tag{A.7}$$

Condition (A.4) is the participation constraint of the potential syndicate members; Condition (A.5) is the mimicking constraint of the lead bank representing a bad borrower.[34]

To begin with, $x_G > 0$ as otherwise the contract would yield a zero payoff for L, despite a type-G borrower holds a positive-NPV project. Moreover, were $x_G < 1$, then increasing x_G slightly, keeping $x_G R_{G,L}$ constant, does not affect neither the maximand nor the left-hand

[34] We write investors' participation constraint in *ex-ante* expected terms and treat the lead's cash pledge $\mathcal{A}_j$ as posted at date 0, prior to the funding decision.

side of Condition (A.5), but increases the left-hand side of Condition (A.4) (because $pR > 1$ and $R_{G,M} = R - R_{G,L}$). Then, $x_G = 1$.

Since with symmetric information the utility of the bad borrower is equal to zero, Constraint (A.5) must be binding. That is, $qR_{G,L} = \mathcal{A}_G$. Plugging $R_{G,L} = \mathcal{A}_G/q$ into Expression (A.3), we obtain:

$$\mathcal{A}_G \left(\frac{p}{q} - 1 \right),$$

which increases in $\mathcal{A}_G$; thus, $\mathcal{A}_G = A$ (L commits its entire funds in the loan) and $R_{G,L} = A/q$.

Finally, the participation constraint of M can be rewritten as

$$pR - 1 > A \left(\frac{p}{q} - 1 \right), \tag{A.8}$$

which holds true under Assumption 1.(A.2). $\square$

To sum up, without common ownership, the lead bank (L) representing a good borrower will underwrite the loan by committing $\mathcal{A}^* = \mathcal{A}_G = A$. The syndicate members (M) receives an interest rate equal to $1 + r^* = R - A/q$.

A.2 Funding with Common Ownership

Consider now the case in which the lead bank places a weight κ on the utility of the commonly owned potential syndicate members. Specifically, there is a fraction $\theta \in (0, 1)$ of commonly owned potential syndicate members (M_{Co}) and a complementary fraction $(1-\theta)$ that are not commonly owned with the lead bank (M_{NCo}). Any contract offered by the lead bank features the same reward to M_{Co} and M_{NCo} (so that $R_{j,M} = R_{j,M_{Co}} = R_{j,M_{NCo}}$, with $j = G, B$).

We equate common ownership to an information transmission device. We let the lead bank channel its private information regarding the borrower's probability of success to the commonly owned syndicate members (M_{Co}). We say that information transmission can happen only if $\kappa \geq \underline{\kappa}$. As a consequence of information transmission, M_{Co} are perfectly informed about the type of the borrower. M_{NCo} know that the lead bank shares its private information with M_{Co}, but do not observe the type of the firm represented by the lead bank L.

The timing of the game with common ownership is as follows. Having shared with M_{Co} its information about the type of borrower it is representing, L designs the contracts to offer to investors. Subsequently, M_{Co} accept or reject. Finally, after observing M_{Co}'s decision, it is M_{NCo}'s turn to accept or reject the contracts offered by L.[35] In approaching the informed potential investors first, the lead bank implements a cheaper form of signaling, through the acceptance decision of the commonly owned syndicate members instead of contract design. This timing is consistent with the institutional setting of loan syndication. Post-mandate, the lead bank informally contacts a group of potential investors to target; the lead bank first presents the loan and shares information about the loan terms and the borrower's creditworthiness to these potential investors. This process is described in Ivashina and Sun (2011) and Bruche et al. (2020).

We find the following:

Proposition 3. *With common ownership, the lead bank representing a good borrower will offer the equilibrium contract with symmetric information, namely:* $x_G = 1$*,* $R_{G,L} = R - 1/p$*,* $R_{G,M} = 1/p$ *and* $\mathcal{A}_G = 0$*. The lead bank representing a bad borrower will never get access to funding (*$x_B = 0$*).*

Proof. We solve the contract design game with common ownership by assuming that L offers $c_j = (\mu_j, x_j, R_{j,L}, R_{j,M}, \mathcal{A}_j)$, with $j = G, B$, where μ_j denotes the probability that the commonly owned investors M_{Co} accept c_j, $x_j \in [0, 1]$, $R = R_{j,L} + R_{j,M}$ and $0 \leq \mathcal{A}_j \leq A$. The timing of the game is:

1. The lead bank L formulates its offer to M_{Co} and M_{NCo}.

2. M_{Co}, being informed about the type of borrower represented by L, accept or reject the offer.

3. Conditional on observing the decision taken by M_{Co}, M_{NCo} update their priors α. We denote M_{NCo}'s posteriors by $\hat{\alpha}$, which depend on the contract offer (including μ).

4. Given $\hat{\alpha}$, M_{NCo} decide whether to accept or reject L's offer.

Because M_{Co} observe the borrower's type, when L offers the symmetric-information contract to a good type, M_{Co} accept with probability one. We therefore restrict attention to candidate equilibria with $\mu_G = \mu_B = 1$; acceptance for B is immaterial since $x_B = 0$. Under

[35] We obtain the same results if we consider a model in which L's decision to share information with M_{NCo} is an equilibrium outcome, M_{NCo} only observe L's decision to share information (not the type of the borrower), and the decision to accept the contract is taken simultaneously by M_{Co} and M_{NCo}. In this alternative model, M_{NCo} update their beliefs on the type of borrower represented by L only based on the latter's decision to share information (and the contract it designs).

c_G^{SI} the M_{Co} participation term binds at zero, so the value of μ_G does not affect feasibility or L's payoff. We can thus compare the symmetric-information contracts directly with the low-information-intensity contracts below.

Specifically, we consider the symmetric-information contracts and the low-information-intensity contracts. By comparing the two, we will show that signaling via the acceptance decision of M_{Co} (as it happens under the acceptance of the symmetric-information contracts) is preferred by the lead bank L to the signaling via the contract design that takes place in the low-information-intensity contracts.

Symmetric information equilibrium contracts. Let the lead bank representing type $j \in \{B, G\}$ offer:

$$\begin{aligned} c_G^{SI} &= (\mu_G, x_G, R_{G,L}, R_{G,M}, \mathcal{A}_j) = (1, 1, R - 1/p, 1/p, 0), \\ c_B^{SI} &= (\mu_B, x_B, R_{B,L}, R_{B,M}, \mathcal{A}_j) = (1, 0, 0, 0, 0). \end{aligned}$$

Since they observe the type of the borrower, M_{Co} accept these contracts. After observing the contract offer and M_{Co}'s decision, M_{NCo} will also accept because $\hat{\alpha}|c_G^{SI} = 1$ and $\hat{\alpha}|c_B^{SI} = 0$, so their participation constraint (PC) is always satisfied with equality:

$$\begin{aligned} PC(c_G^{SI}) :\ & (1-\theta)[x_G(pR_{G,M} - 1) + \mathcal{A}_G] = 0, \\ PC(c_B^{SI}) :\ & (1-\theta)[x_B(qR_{B,M} - 1) + \mathcal{A}_B] = 0. \end{aligned}$$

It follows that, at the symmetric information contracts, the utility of a lead bank representing a good type is $U_L^{SI} = pR - 1$; the utility of a lead bank representing a bad type is equal to zero.

Low-information-intensity optimum contracts. We now construct the separating allocation corresponding to the low-information-intensity optimum of the game with common ownership. Assumption 1.(A.2) guarantees that this optimum allocation exists in this setting.

For the same reason as in the proof of Proposition 2, the lead bank L sets

$$(\mu_B, x_B, R_{B,L}, R_{B,M}, \mathcal{A}_B) = (1, 0, 0, 0, 0),$$

and maximizes $\mathcal{M}_{G,L}(c_G)$ with respect to $c_G = (1, x_G, R_{G,L}, R_{G,M}, \mathcal{A}_G)$, subject to:

$$x_G(pR_{G,M} - 1) + \mathcal{A}_G \geq 0, \tag{A.9}$$

$$x_G q R_{G,L} - \mathcal{A}_G + \theta\kappa \tilde{U}_{B,M_{Co}} \leq 0. \tag{A.10}$$

Condition (A.9) is M_{NCo}'s participation constraint, Condition (A.10) is the mimicking constraint, and $\tilde{U}_{B,M_{Co}} \equiv x_G(qR_{G,M} - 1) + \mathcal{A}_G$. Proceeding as in the analysis without common ownership, we find that $x_G = 1$, $\mathcal{A}_G = A$, and

$$R_{G,L} = \frac{A}{q} - \frac{\theta\kappa}{(1-\theta\kappa)q}(qR - 1). \tag{A.11}$$

Plugging these values into $\mathcal{M}_{G,L}(c_G)$ we find that, with common ownership, the utility of the lead bank representing a good borrower at the low-information-intensity optimum separating allocation is

$$U_L^{SE} = (1-\theta\kappa)A\left(\frac{p}{q} - 1\right) - \frac{\theta\kappa p}{q}(qR - 1) + \theta\kappa(pR - 1).$$

Finally, the participation constraint of M_{NCo} in (A.9) can be rewritten as

$$U_L^{SI} \geq U_L^{SE}, \tag{A.12}$$

which holds true by Assumption 1.(A.2).

Equilibrium contracts. Given the results above, and, in particular, Condition (A.12), it follows that: (i) a lead bank L representing a good borrower strictly prefers offering c_G^{SI} to the low-information-intensity optimum contracts; (ii) a lead bank L representing a bad borrower will never get access to funding. □

To sum up, if common ownership is an information transmission device, we find that, as with symmetric information, only the good projects will be funded ($x_G = 1$,$x_B = 0$), the loan is fully underwritten by the members of the syndicate ($\mathcal{A}^{**} = \mathcal{A}_G = 0$) in exchange of an interest rate equal to $1 + r^{**} = 1/p$. In analogy to the case without common ownership, the contract targeting a good type can be interpreted as a debt contract in which the members of the syndicate transfer 1 upfront and get $1/p$ in the case of project success, or else the borrower goes bankrupt.

In the proof, we also show that the lead bank L prefers signaling through the acceptance decision of the commonly owned syndicate members to signaling via the contract design in the low-information-intensity contracts.

A.3 Empirical Predictions

The following proposition gives the three empirical predictions of the model (also listed in Proposition 1), and formally proves them. Our null hypothesis is that common ownership facilitates information transmission; thus, our predictions are based on comparing the results in Proposition 2 and Proposition 3.

Proposition 4. *Building on the lending contracts obtained with and without common ownership, we find the results in Proposition 1.*

Proof. For the first prediction,

$$r^* - r^{**} \quad = \quad R - \frac{A}{q} - \frac{1}{p} > 0 \tag{A.13}$$

$$\iff \quad A < \frac{q(pR-1)}{p} \tag{A.14}$$

follows from Assumption 1.

The second prediction directly follows from $\mathcal{A}^{**} = 0 < A = \mathcal{A}^*$.

For the third prediction, we consider the budget allocation problem of a lead bank L during two periods, $t = 1$ and $t = 2$. We assume that n good borrowers are seeking a loan in each period t, each associated with one project $j = 1, ..., n$. The lead bank that takes the mandate on the project is fully informed about the type. The maximum liquidity that can be invested in each specific loan is A. We denote by $\overline{A}$ the exogenously given capital allocated by the lead bank to the syndicated lending business over the two periods. Each project is characterized by a level of common ownership κ_j with the share of commonly-owned syndicate members and a threshold level such that common ownership κ_j is high or low, $\underline{\kappa}_j$.

At the beginning of each period t, the lead bank L decides the projects for which it takes the mandate. With high common ownership, the loan will be funded according to the conditions in Proposition 3 (high common ownership). Otherwise, the contracts are those in Proposition 2 (no common ownership).

The following conditions will determine the number of loans for which a lead bank L can commit to take the mandate in each period t:

$$t = 1: \quad \overline{A} \geq \sum_{j=1}^{n} \left\{ \mathrm{I}_{\kappa_j < \underline{\kappa}_j} \times A + (1 - \mathrm{I}_{\kappa_j < \underline{\kappa}_j}) \times 0 \right\} = n_1 A \tag{A.15}$$

$$t = 2: \quad \max(\overline{A} - n_1 A, 0) \geq \sum_{j=1}^{n} \left\{ \mathrm{I}_{\kappa_j < \underline{\kappa}_j} \times A + (1 - \mathrm{I}_{\kappa_j < \underline{\kappa}_j}) \times 0 \right\}, \tag{A.16}$$

where we use that $\mathcal{A}_G = 0$ with high common ownership, and $\mathcal{A}_G = A$ with low or no common ownership, n_1 is the number of good projects with low common ownership in period $t = 1$ and $\mathrm{I}_{\kappa_j < \underline{\kappa}_j}$ is an indicator function that equals one if $\kappa_j < \underline{\kappa}_j$, zero otherwise.

Ceteris paribus, conditions (A.15) and (A.16) are the more slack, the lower the number of good projects with a low level of common ownership for which the lead bank has committed to take the mandate during the funding period.

$\square$

Appendix B

Table B.I: **Largest Shareholders of Three Largest Banks**

JP Morgan

2002		2007		2014	
CAPITAL RESEARCH & MANAGEMENT	8%	HANSON INVESTMENT MANAGEMENT	6%	BLACKROCK INC	6%
BARCLAYS GLOBAL INVESTORS	4%	AXA	5%	VANGUARD GROUP INC	5%
STATE STREET CORP	3%	STATE STREET CORP	4%	STATE STREET CORP	5%
DEUTSCHE BANK	3%	FMR LLC	3%	FMR LLC	3%
AXA	3%	DAVIS SELECTED ADVISERS	2%	CAPITAL WORLD INVESTORS	3%

Citigroup

2002		2007		2014	
STATE STREET CORP	5%	STATE STREET CORP	3%	BLACKROCK INC	6%
BARCLAYS GLOBAL INVESTORS	4%	CAPITAL RESEARCH GLOBAL INVESTORS	3%	VANGUARD GROUP INC	5%
MANUFACTURERES LIFE INSURANCE	4%	CAPITAL WORLD INVESTORS	3%	STATE STREET CORP	5%
FMR CORP	4%	FMR LLC	2%	FMR LLC	3%
AXA	3%	AXA	2%	WELLINGTON MANAGEMENT GROUP	2%

Bank of America

2002		2007		2014	
MANUFACTURERES LIFE INSURANCE	8%	STATE STREET CORP	3%	BLACKROCK INC	6%
BARCLAYS GLOBAL INVESTORS	4%	FMR LLC	3%	VANGUARD GROUP INC	5%
FMR CORP	4%	AXA	2%	STATE STREET CORP	5%
DEUTSCHE BANK	3%	CAPITAL RESEARCH GLOBAL INVESTORS	2%	FMR LLC	4%
AXA	3%	WELLINGTON MANAGEMENT GROUP	2%	JPMORGAN	2%

This table reports the five largest shareholders of the three largest lead arrangers in the U.S. syndicated loan market. Ownership data comes from the Thomson Reuters s34 database.

Table B.III: **Interest rates - full results and robustness checks**

	(1) Baseline	(2) Baseline	(3) Lead × Year-Qtr FE	(4) Borrower × Year FE	(5) No Top2	(6) log(Spread)	(7) Remove Non-Banks and Foreign Banks	(8) Remove Private Banks
CO^{avg}	-15.64***		-21.40***	-38.25***	-16.63*	-0.0981***	-25.46**	-30.37***
	(-5.52)		(-6.36)	(-4.92)	(-1.97)	(-3.57)	(-2.53)	(-3.07)
CO^{avg} Quintile 2		1.251						
		(0.62)						
CO^{avg} Quintile 3		-3.584						
		(-1.46)						
CO^{avg} Quintile 4		-7.859***						
		(-3.41)						
CO^{avg} Quintile 5		-10.05***						
		(-4.89)						
CO Bank-Borrower	-13.70***	-13.47***	-13.35***	-21.68**	-36.75***	-0.0508**	-47.73*	1.466
	(-3.23)	(-3.17)	(-2.82)	(-2.15)	(-2.87)	(-2.62)	(-1.97)	(0.12)
Facility Amount \$M	-18.92***	-19.01***	-19.29***	-27.04***	-2.035	-0.0698***	-29.64***	-28.73***
	(-4.24)	(-4.25)	(-4.23)	(-5.85)	(-0.24)	(-4.49)	(-3.55)	(-3.24)
Log Maturity	1.126	1.169	0.0613	-2.491*	6.698**	0.0242***	1.698	-1.037
	(0.93)	(0.97)	(0.05)	(-1.76)	(2.39)	(4.37)	(0.82)	(-0.41)
Secured Loan	17.32***	17.22***	13.38***	-8.174	38.30***	0.190***	16.01**	2.361
	(4.29)	(4.25)	(3.04)	(-1.23)	(6.46)	(7.45)	(2.17)	(0.42)
Refinancing	-9.814***	-9.817***	-11.15***	-18.74***	-10.88*	-0.0612***	-5.426	-16.96***
	(-10.08)	(-9.95)	(-8.44)	(-6.73)	(-1.96)	(-6.77)	(-0.60)	(-6.16)
Log Number of Members	-19.47***	-19.58***	-18.78***	-17.17***	-23.82***	-0.115***	-20.41	-30.80***
	(-8.37)	(-8.53)	(-9.56)	(-6.14)	(-6.44)	(-10.20)	(-1.47)	(-6.42)
Guarantor	-5.739***	-5.560***	-4.731***	-18.53**	-10.43	0.0168	-2.305	-15.09***
	(-3.48)	(-3.37)	(-3.24)	(-2.54)	(-1.28)	(1.24)	(-0.44)	(-3.96)
Relationship Score	-240.3***	-232.1***	-255.9***	-198.3	-184.9***	-1.714***	-146.0	-389.6**
	(-4.02)	(-3.89)	(-3.60)	(-1.53)	(-4.44)	(-4.18)	(-1.52)	(-2.66)
Reciprocity	-3.755**	-3.954**	-6.173**	-25.76***	-1.908	0.0146	5.340	-1.551
	(-2.14)	(-2.27)	(-2.63)	(-4.51)	(-0.58)	(1.30)	(0.56)	(-0.25)
New Lending Relation	-0.903	-0.894	-0.442	-1.313	-3.491	0.00601	-0.201	-3.198
	(-0.74)	(-0.72)	(-0.33)	(-0.51)	(-0.97)	(0.82)	(-0.04)	(-0.88)
LIBOR 3M	-106.2	-129.5	-66.55	-1458.7***	-826.3	-3.244	-1226.9	-1216.9
	(-0.19)	(-0.23)	(-0.16)	(-6.66)	(-0.47)	(-1.09)	(-1.16)	(-1.46)
Non-Bank Synd. Member	12.03***	12.17***	10.05***	1.113	23.50***	0.0896***	0	-2.276
	(4.86)	(4.89)	(4.05)	(0.16)	(3.94)	(7.51)	(.)	(-0.38)
Prob. Default	44.22***	44.04***	44.03***	34.62*	37.86**	0.182***	42.27**	8.476
	(6.20)	(6.13)	(4.81)	(1.89)	(2.50)	(6.14)	(2.32)	(0.38)
Stock Volatility	103.8***	103.4***	110.2***	147.2***	66.46***	0.346***	4.576	88.77***
	(13.27)	(13.19)	(15.01)	(4.19)	(5.71)	(8.41)	(0.24)	(4.98)
Size	-6.029***	-6.015***	-4.883***		-4.151	-0.0563***	-15.63***	-14.68***
	(-4.54)	(-4.52)	(-3.31)		(-1.48)	(-4.34)	(-2.94)	(-3.50)
Profitability	-58.88***	-58.56***	-57.27***		-18.96	-0.176**	-57.11	-81.97***
	(-5.42)	(-5.45)	(-5.96)		(-1.17)	(-2.13)	(-0.64)	(-3.45)
sd of profitability	1.811	1.869	2.529		-0.517	0.0176***	539.2***	11.17
	(1.34)	(1.35)	(1.18)		(-0.68)	(2.70)	(3.91)	(0.26)
Book Leverage	38.57***	38.44***	38.43***		17.16	0.268***	100.9***	96.64***
	(4.59)	(4.54)	(4.37)		(1.15)	(5.77)	(3.94)	(4.98)
Tangibilities	43.50***	44.04***	45.81***		12.49	-0.000159	136.5*	87.29**
	(3.83)	(3.85)	(3.70)		(1.07)	(-0.00)	(1.89)	(2.22)
Tobin's Q	-6.794***	-6.785***	-6.734***		-3.378	-0.0611***	-8.242	-6.363**
	(-6.13)	(-6.10)	(-6.33)		(-1.23)	(-8.12)	(-1.30)	(-2.36)
Log Int. Cov.	-7.110***	-7.152***	-6.720***		-15.22***	-0.0603***	1.150	-3.450*
	(-3.73)	(-3.78)	(-3.56)		(-8.46)	(-6.53)	(0.36)	(-1.73)
Liquidity Ratio	40.82***	41.52***	34.62***		51.66*	0.272***	90.35***	37.27
	(4.02)	(4.08)	(3.90)		(1.83)	(4.41)	(2.71)	(1.07)
S&P Rating D	-32.03**	-33.93**	11.34		0	-0.379***	0	0
	(-2.24)	(-2.33)	(0.50)		(.)	(-10.73)	(.)	(.)
S&P Rating CC	35.93**	34.10**	-14.19		44.31**	-0.108	0	0
	(2.48)	(2.30)	(-0.59)		(2.14)	(-1.25)	(.)	(.)
S&P Rating CCC	38.23**	38.09**	36.81**		68.26	0.133***	59.02	89.13**
	(2.55)	(2.56)	(2.32)		(1.10)	(2.87)	(1.25)	(2.28)
S&P Rating B	-2.218	-2.266	-0.240		14.75	-0.0732***	8.870	8.422
	(-0.65)	(-0.66)	(-0.07)		(1.62)	(-5.29)	(0.52)	(1.03)
S&P Rating BB	-6.171**	-6.316**	-7.601***		5.635	-0.0358***	19.66	-7.773
	(-2.47)	(-2.57)	(-3.19)		(0.91)	(-2.72)	(1.52)	(-1.26)
S&P Rating BBB	-24.30***	-24.57***	-28.65***		-13.08*	-0.140***	-18.08	-12.45**

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	(1) Baseline	(2) Baseline	(3) Lead × Year-Qtr FE	(4) Borrower × Year FE	(5) No Top2	(6) log(Spread)	(7) US Banks Only	(8) No Private Banks
	(-10.56)	(-10.66)	(-11.28)		(-1.90)	(-7.86)	(-0.99)	(-2.33)
S&P Rating A	-38.68***	-39.03***	-42.95***		-33.95***	-0.501***	-71.71**	-32.03***
	(-10.00)	(-10.22)	(-12.00)		(-2.98)	(-19.30)	(-2.30)	(-3.42)
S&P Rating AA	-29.87***	-30.64***	-33.84***		-32.49*	-0.712***	-24.79	-22.85
	(-5.30)	(-5.62)	(-6.21)		(-1.79)	(-13.88)	(-0.53)	(-1.15)
S&P Rating AAA	-19.04*	-18.56*	-18.40***		1.552	-0.955***	0	0
	(-1.95)	(-1.90)	(-3.20)		(0.07)	(-16.38)	(.)	(.)
Lead Size Q2	2.414	3.371		-3.354	-9.882	-0.0221	2.307	9.187
	(0.46)	(0.64)		(-0.81)	(-0.82)	(-0.54)	(0.46)	(0.89)
Lead Size Q3	-6.385	-5.705		-6.602	-27.41**	-0.0925**	-9.640	-0.933
	(-1.15)	(-1.03)		(-1.15)	(-2.18)	(-2.07)	(-1.16)	(-0.08)
Lead Size Q4	-4.927	-3.911		-8.444	-30.15**	-0.0981**	-10.91	-3.749
	(-0.82)	(-0.65)		(-1.28)	(-2.49)	(-2.16)	(-1.02)	(-0.31)
Lead Size Q5	-7.188	-6.011		-9.740	-65.54***	-0.121**	-7.792	-4.473
	(-1.11)	(-0.93)		(-1.41)	(-3.24)	(-2.18)	(-0.75)	(-0.36)
Lead Market Equity	-2.269	-1.146		4.378	57.11**	-0.0109	-9.479	29.05
	(-0.14)	(-0.07)		(0.71)	(2.10)	(-0.12)	(-0.52)	(1.40)
Lead Book Leverage	6.073	2.244		11.11	49.85	0.0651	-29.85	40.82*
	(0.46)	(0.17)		(1.04)	(1.39)	(0.68)	(-1.51)	(1.83)
Lead ROA	61.47	61.57		43.73	113.7***	0.329*	10.44	0.893
	(1.27)	(1.28)		(1.56)	(2.74)	(1.79)	(0.56)	(0.02)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes
SIC2 × Year-Quarter FE	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Lead × Year-Quarter FE	No	No	Yes	No	No	No	No	No
Borrower × Year FE	No	No	No	Yes	No	No	No	No
Observations	25,975	25,975	25,904	23,769	6,015	25,975	4,942	10,664
Adjusted R-squared	0.794	0.794	0.803	0.878	0.714	0.869	0.911	0.823

The table reports OLS regression estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). Columns (1)-(2) report the main results with the full set of controls. Column (3) and (4) report results on the full sample with a different set of fixed-effects. Column (5) excludes all the loans that had Bank of America or JP Morgan as lead arrangers. Column (6) reports the results the logarithm of the all-in-drawn spread as the dependent variable. Column (7) restricts the sample to syndicates composed exclusively by U.S. commercial banks. Column (8) excludes all loans that contain facilities with private banks. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B.II: **Variable Definition**

Variable	Description
	Loan Variables
All-in-Drawn Spread	Facility all-in-drawn spread over the LIBOR rate
CO^{avg}	Average common ownership (profit weight) between syndicate lead arranger and syndicate members
CO Quintile Q1,...,5	Common ownership quintile dummy
CO Member-Borrower	Average common ownership (profit weight) between borrower and syndicate banks
CO^{max}	Maximum common ownership (profit weight) between the lead arranger and any syndicate members
CO^{vw}	Lead-size–weighted average common ownership (profit weight) between syndicate lead arranger and syndicate members
CO^{mh}	Average of the minimum commonly held shares between the lead arranger and the syndicate member
Facility Amount	Facility amount divided by borrower's total assets
Loan Amount $	Loan amount in million dollars
Lead Amount	% of the facility amount retained by the lead bank
$w_{a,t}$	Ratio of the dollar value of loans underwritten by the lead bank to the total loan market allocations in quarter t.
$w^L_{a,t}$	Ratio of the dollar value of loans underwritten by the lead bank in low CO syndicates to the total loan market allocations in quarter t.
# Facilities within Loan	Number of facilities within the same loan
Log Maturity	Natural logarithm of the maturity of the facility in months
Secured Loan	Dummy variable equal to 1 if the facility is secured
Refinancing	Dummy variable equal to 1 if the purpose of the facility is refinancing
Log Number of Members	Natural logarithm of the number of syndicate members
Time-on-the-Market (TOM)	Number of days between syndication start (launch) and closing date.
Guarantor	Dummy variable equal to 1 if the facility has a guarantor
Relationship Score	$\frac{\frac{1}{N}\times\sum_j^N \text{Number of facilities between lead}_i \text{ and participant}_j \text{ in the past 3 years}}{\text{Number of facilities arranged by lead}_i \text{ in the past 3 years}}$
Reciprocity Depth	Average fraction of reciprocal loans taken by the lead arranger
New Lending Relation	Dummy equal to 1 if the borrower has not received a loan from the lead arranger(s) in the syndicate before
LIBOR 3M	LIBOR 3-months rate at the time of the loan origination
FED Funds Rate	Federal Funds Effective Rate (dff)
VIX	VIX index
Non-Bank Syndicate Member	Dummy variable equal to 1 if the facility has a non-bank lender in the syndicate
Prob. Default	Borrower default risk as in Bharath and Shumway (2008)
Volatility	SD of the borrower's stock return over the 12 months period before loan issuance
Credit Line	Dummy variable equal to 1 if the facility is a credit line
Term Loan A	Dummy variable equal to 1 if the facility is a term loan A
Term Loan B	Dummy variable equal to 1 if the facility is a term loan B or higher (C,D,...,H)
	Borrower Variables
Size	natural logarithm of the borrower's total assets
ROA	EBIT over total assets
Book Leverage	Debt over total assets
Tangibilities	PP&T over total assets PP&T over total assets
S&P Rating AAA, AA, ... C	S&P credit rating of the borrower.
High Yield	Dummy variable equal to 1 if the borrower has a high-yield rating
Unrated Borrower	Dummy variable equal to 1 if the borrower is unrated
Tobin's Q	Market to book value
Log Int. Cov.	Log of 1 plus interest coverage truncated at 0
Liquidity Ratio	Cash over total asset
	Bank Variables
Lead Size	Natural logarithm of the bank's total assets
Lead Size Q1,...,5	Lead size quintile dummy
Lead Market Equity	Market value of equity capital over total assets
Lead Book Equity	Book value of equity capital over total assets
Lead Leverage	Bank debt over total assets
Lead ROA	Net income over total assets
MMC	Multi-market contact between lead and member as in Hatfield and Wallen (2022)
log(distance)	Log distance (km) between lead and member HQs
Portf. Distance Lead-Member	Portfolio distance between the lead bank and the syndicate participant in the previous four quarters as in Cai et al. (2018)

Table B.IV: **Interest rates - CO data from Amel-Zadeh et al. (2022) only**

	(1)	(2)	(3)	(4)	(5)	(6)
CO^{avg}	-14.52***					
	(-3.58)					
CO^{avg} Quintile 2		-0.391				
		(-0.16)				
CO^{avg} Quintile 3		-4.088				
		(-1.30)				
CO^{avg} Quintile 4		-5.451*				
		(-2.01)				
CO^{avg} Quintile 5		-10.51***				
		(-3.24)				
CO^{max}			-14.73***		-47.77**	
			(-3.81)		(-2.33)	
CO^{max} Quintile 2				-9.738***		-40.44*
				(-2.86)		(-1.94)
CO^{max} Quintile 3				-17.24***		-59.08**
				(-4.63)		(-2.50)
CO^{max} Quintile 4				-12.31***		-51.53***
				(-3.15)		(-3.32)
CO^{max} Quintile 5				-18.24***		-65.34***
				(-4.61)		(-4.46)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	No	No
Lead FE	Yes	Yes	Yes	Yes	No	No
Borrower FE	Yes	Yes	Yes	Yes	No	No
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes	No	No
Loan FE	No	No	No	No	Yes	Yes
Observations	16,604	16,604	16,604	16,604	16,535	16,535
Adjusted R-squared	0.807	0.807	0.807	0.807	0.932	0.932

The table reports OLS regression estimates and t-statistics of Equation (5) using the sample of Kasperk et al. (2024) (2000q4-2017q1). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). For each measure, we also show quintile indicators. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B.V: **Interest rates - CO data winsorized**

	(1)	(2)	(3)	(4)	(5)	(6)
CO^{avg}	-14.76***					
	(-5.10)					
CO^{avg} Quintile 2		1.850				
		(0.91)				
CO^{avg} Quintile 3		-5.527**				
		(-2.32)				
CO^{avg} Quintile 4		-8.908***				
		(-3.67)				
CO^{avg} Quintile 5		-9.883***				
		(-4.89)				
CO^{max}			-10.20***		-21.72***	
			(-3.66)		(-2.81)	
CO^{max} Quintile 2				-6.599**		-17.21***
				(-2.31)		(-2.85)
CO^{max} Quintile 3				-8.481***		-8.520
				(-3.15)		(-0.89)
CO^{max} Quintile 4				-7.845***		-9.981
				(-2.68)		(-1.32)
CO^{max} Quintile 5				-11.77***		-24.60***
				(-4.63)		(-4.12)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	No	No
Lead FE	Yes	Yes	Yes	Yes	No	No
Borrower FE	Yes	Yes	Yes	Yes	No	No
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes	No	No
Loan FE	No	No	No	No	Yes	Yes
Observations	26,002	26,002	26,002	26,002	29,337	29,337
Adjusted R-squared	0.794	0.794	0.794	0.794	0.918	0.918

The table reports OLS regression estimates and t-statistics of Equation (5) using a sample in which the distributions of the common ownership measures are windsorized at the 1% level of the left and right tail of the distribution. The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). For each measure, we also show quintile indicators. Specifications control for facility-loan, lender, and borrower characteristics as indicated. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B.VI: **Common Ownership - Alternative definitions**

	(1)	(2)	(3)	(4)
	Spread		Lead Amount Imputed	
CO^{vw}	-15.96***		-1.528***	
	(-5.25)		(-3.29)	
CO^{mh}		-104.1***		-16.97***
		(-4.22)		(-7.26)
Facility Type FE	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes	Yes
SIC2 × Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	25,923	25,851	24,551	24,483
Adjusted R-squared	0.794	0.796	0.782	0.785

The table reports OLS regression estimates and t-statistics of Equation (5) and Equation (10). Columns (1) and (3) use a value-weighted definition of common ownership (CO^{vw}), where syndicate members are weighted by their market capitalization.[36] Columns (2) and (4) implement the alternative definition of common ownership from Newham et al. (2022), computed as the average of the minimum commonly held shares between the lead arranger and the syndicate members (CO^{mh}). The dependent variables are the all-in-drawn loan spread in basis points (Columns 1–2) and the percentage of the loan retained by the lead arranger (Columns 3–4). Specifications include facility type, loan purpose, lead, borrower, and SIC2 × year-quarter fixed effects. Standard errors are clustered by lead bank. All variables are defined in Table B.II. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B.VII: **Common Ownership and Time-on-the-Market**

	(1)	(2)	(3)	(4)
	Invest. Grade only		Full Sample	
CO	-23.85***		-31.10**	
	(-3.84)		(-2.14)	
CO (Max)		-20.26***		-20.05*
		(-3.86)		(-1.86)
Time-On-Market			0.141	0.144
			(1.39)	(1.40)
Facility Type FE	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	No
SIC2 × Year-Quarter FE	Yes	Yes	No	No
SIC2 × Year FE	No	No	Yes	Yes
Observations	8,601	8,601	2,657	2,657
Adjusted R-squared	0.841	0.841	0.701	0.701

The table reports OLS regression estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficients of interest are those on the two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). In columns (1) and (2), the dependent variable is the all-in-drawn loan spread, expressed in basis points; the OLS regression is performed on the subsample of investment-grade loans. In columns (3) and (4), we add time-on-the-market, namely the number of days from the start to completion of syndication, as a control in the regression. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table B.VIII: **Interest rates**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			TWFE			Doubly robust DiD	
Treat x Post	-20.67*	-36.18***	-33.86***	-25.51***	-24.73*	-17.13***	-21.35***
	(-1.87)	(-3.64)	(-3.49)	(-3.02)	(-1.68)	(-30.39)	(-6.40)
Facility and loan controls	Yes	Yes	Yes	Yes	No	No	No
Borrower controls	Yes	Yes	Yes	Yes	No	No	No
Lead bank controls	Yes	Yes	Yes	Yes	No	No	No
Facility type FE	Yes	Yes	Yes	Yes	No	No	No
Loan purpose FE	Yes	Yes	Yes	Yes	No	No	No
SIC 3 x Year	Yes	No	No	No	No	No	No
Lead FE	Yes	Yes	No	No	No	No	No
SIC 3	Yes	No	No	No	No	Yes	No
SIC 2	No	No	No	No	No	No	Yes
SIC 2 x Year	No	Yes	Yes	Yes	No	No	No
Lead FE x Year	No	No	Yes	No	No	No	No
Lead FE x Quarter	No	No	No	Yes	No	No	No
Observations	4987	5114	5105	5049			

The table reports the parameter estimates and t-statistics of Equation (9). The dependent variable is the all-in-drawn loan spread, expressed in basis points. In columns (1) to (4), we report the OLS estimates from a two-way-fixed-effect regression; in columns (5) to (7) we report estimates from the doubly robust difference-in-differences estimator of Sant'Anna and Zhao (2020). The variable treat is an indicator equal to one if the facility level of common ownership is in the top tercile of the CO delta distribution; CO delta is calculated as the difference between the actual level of common ownership between lenders and the counterfactual level of common ownership between lenders where we treat the holdings of BlackRocks and BGI as one entity. The variable Post is an indicator equal to one if the loan originates after the merger BlackRock-BGI. Standard errors are clustered at the lead-bank level. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Table B.IX: **Facility amount retained by the lead bank - full results and robustness checks**

	(1) Lead Amount Dealscan	(2) Exclude Term B And Leveraged	(3) Lead Amount Approximated	(4) Lead Amount Dealscan	(5) Exclude Term B And Leveraged	(6) Lead Amount Approximated
CO^{avg}	-2.476**	-2.858*	-1.396***			
	(-2.35)	(-1.87)	(-3.29)			
CO^{max}				-4.429***	-3.505***	-2.770***
				(-2.85)	(-3.11)	(-6.07)
CO Bank-Borrower	-2.522**	0.126	-0.655***	-2.195**	0.111	-0.552**
	(-2.60)	(0.25)	(-2.97)	(-2.46)	(0.22)	(-2.56)
Facility Amount \$M	1.740	2.431**	-6.861***	1.793	2.374**	-6.792***
	(1.57)	(2.43)	(-15.32)	(1.60)	(2.36)	(-15.40)
Log Maturity	0.258	-0.382*	-0.921***	0.251	-0.365*	-0.934***
	(0.87)	(-1.93)	(-9.40)	(0.85)	(-1.86)	(-9.61)
Secured Loan	0.334	-0.0625	-0.448***	0.307	-0.0946	-0.453***
	(0.40)	(-0.12)	(-3.13)	(0.37)	(-0.19)	(-3.20)
Refinancing	-0.636	-0.454	-1.208***	-0.671	-0.347	-1.172***
	(-0.77)	(-1.07)	(-10.18)	(-0.84)	(-0.82)	(-10.21)
Log Number of Members	-12.65***	-12.98***	-6.090***	-12.25***	-12.68***	-5.840***
	(-7.67)	(-9.62)	(-22.15)	(-7.30)	(-10.10)	(-21.21)
Guarantor	0.124	0.0343	-0.0625	0.0692	0.0223	-0.0615
	(0.38)	(0.15)	(-0.51)	(0.21)	(0.10)	(-0.53)
Relationship Score	41.73	-97.79***	-14.26	40.86	-94.98***	-13.48
	(1.64)	(-3.39)	(-1.47)	(1.62)	(-3.28)	(-1.48)
Reciprocity	-1.907***	-0.533	-0.221	-1.837***	-0.651	-0.228
	(-3.29)	(-0.93)	(-1.30)	(-3.24)	(-1.11)	(-1.34)
New Lending Relation	0.258	-0.348	-0.284**	0.418	-0.223	-0.169
	(0.88)	(-0.81)	(-2.13)	(1.49)	(-0.56)	(-1.23)
LIBOR 3M	82.49	-217.1	98.16	96.99	-216.0	101.3
	(0.39)	(-1.59)	(1.39)	(0.47)	(-1.62)	(1.42)
Non-Bank Synd. Member	2.281***	0.874*	1.235***	2.168***	0.858	1.159***
	(4.15)	(1.71)	(7.52)	(4.01)	(1.69)	(7.48)
Prob. Default	4.664**	9.492***	0.759	3.904*	8.763***	0.685
	(2.12)	(3.73)	(1.67)	(1.79)	(3.67)	(1.50)
Stock Volatility	0.930	2.341	1.526***	1.437	1.802	1.472***
	(0.56)	(0.53)	(3.41)	(0.90)	(0.40)	(3.47)
Size	0.149	0.719***	-2.369***	0.276	0.676**	-2.292***
	(0.33)	(2.73)	(-14.61)	(0.62)	(2.70)	(-13.89)
Profitability	1.313	-2.457	-1.234*	1.612	-2.253	-1.301*
	(0.58)	(-1.59)	(-1.74)	(0.69)	(-1.61)	(-1.83)
sd of profitability	0.453***	12.11	0.149**	0.467***	13.44	0.147**
	(3.22)	(1.02)	(2.63)	(3.32)	(1.10)	(2.62)
Book Leverage	-0.544	1.607	-1.493***	-0.499	1.465	-1.509***
	(-0.33)	(0.97)	(-3.20)	(-0.32)	(0.91)	(-3.35)
Tangibilities	-4.828	2.239	-2.822***	-4.618	2.130	-2.601***
	(-1.66)	(1.42)	(-3.33)	(-1.59)	(1.40)	(-3.15)
Tobin's Q	-0.748***	0.155	-0.0551	-0.758***	0.123	-0.0558
	(-3.23)	(0.96)	(-0.62)	(-3.27)	(0.70)	(-0.63)
Log Int. Cov.	0.500	0.254	0.0434	0.507	0.234	0.0317
	(1.23)	(1.39)	(0.50)	(1.27)	(1.41)	(0.36)

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Table B.IX: **Facility amount retained by the lead bank - full results and robustness checks**

	(1) Lead Amount Dealscan	(2) Exclude Term B And Leveraged	(3) Lead Amount Approximated	(4) Lead Amount Dealscan	(5) Exclude Term B And Leveraged	(6) Lead Amount Approximated
Liquidity Ratio	3.104	1.673	0.350	2.908	1.873	0.457
	(0.84)	(1.12)	(0.30)	(0.78)	(1.22)	(0.40)
S&P Rating D			-6.719***			-6.237***
			(-7.34)			(-6.69)
S&P Rating CC			6.106***			6.801***
			(2.73)			(3.06)
S&P Rating CCC			-1.770*			-1.636*
			(-1.88)			(-1.72)
S&P Rating B	0.859	-10.41***	-0.976***	0.804	-10.46***	-0.915***
	(0.80)	(-6.32)	(-2.90)	(0.74)	(-6.49)	(-2.86)
S&P Rating BB	0.453	0.249	-0.670***	0.287	0.256	-0.623**
	(0.46)	(0.24)	(-2.85)	(0.29)	(0.25)	(-2.66)
S&P Rating BBB	0.952	0.499	-0.00356	0.790	0.537	-0.0293
	(1.05)	(0.74)	(-0.01)	(0.85)	(0.85)	(-0.11)
S&P Rating A	0.847	0.355	0.634*	0.804	0.342	0.612*
	(1.00)	(0.63)	(1.97)	(0.92)	(0.65)	(1.96)
S&P Rating AA	1.846	0.314	0.455	2.067	0.564	0.457
	(1.42)	(0.32)	(1.19)	(1.54)	(0.64)	(1.21)
S&P Rating AAA	2.633	0.681	-0.0697	2.067	0.542	-0.116
	(0.59)	(0.57)	(-0.09)	(0.47)	(0.46)	(-0.15)
Lead Size Q2	0.667	-6.214***	-0.779*	0.548	-6.205***	-0.843**
	(0.68)	(-7.43)	(-1.90)	(0.59)	(-7.66)	(-2.05)
Lead Size Q3	1.022	-6.233***	-0.505	0.861	-6.300***	-0.618
	(1.02)	(-6.96)	(-1.04)	(0.90)	(-7.29)	(-1.32)
Lead Size Q4	1.494	-6.868***	-0.265	1.324	-6.921***	-0.344
	(1.27)	(-5.59)	(-0.38)	(1.17)	(-5.72)	(-0.51)
Lead Size Q5	2.082	-6.815***	0.0789	1.895	-6.880***	-0.0119
	(1.61)	(-6.14)	(0.11)	(1.54)	(-6.34)	(-0.02)
Lead Market Equity	-3.445	-4.421	0.275	-2.445	-3.913	0.731
	(-0.55)	(-1.10)	(0.18)	(-0.39)	(-0.95)	(0.50)
Lead Book Leverage	-4.917	8.532**	1.115	-4.398	8.960**	1.762
	(-1.34)	(2.24)	(0.88)	(-1.19)	(2.35)	(1.41)
Lead ROA	-110.8**	76.95***	0.994	-112.4**	78.38**	0.382
	(-2.29)	(2.77)	(0.24)	(-2.33)	(2.67)	(0.09)
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	Yes	No	Yes	Yes	No	Yes
SIC2 $\times$ Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,955	2,839	24,601	7,955	2,839	24,601
Adjusted R-squared	0.806	0.806	0.783	0.806	0.807	0.784

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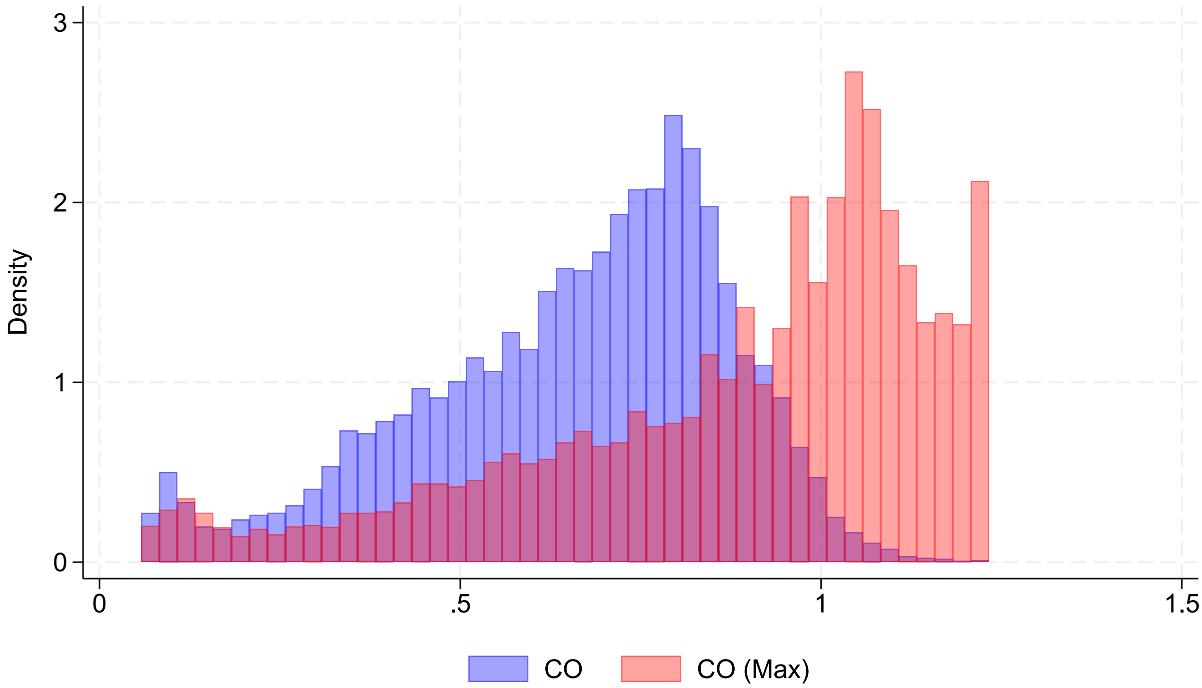
Table B.IX: **Facility amount retained by the lead bank - full results and robustness checks**

	(1)	(2)	(3)	(4)	(5)	(6)
	Lead Amount Dealscan	Exclude Term B And Leveraged	Lead Amount Approximated	Lead Amount Dealscan	Exclude Term B And Leveraged	Lead Amount Approximated

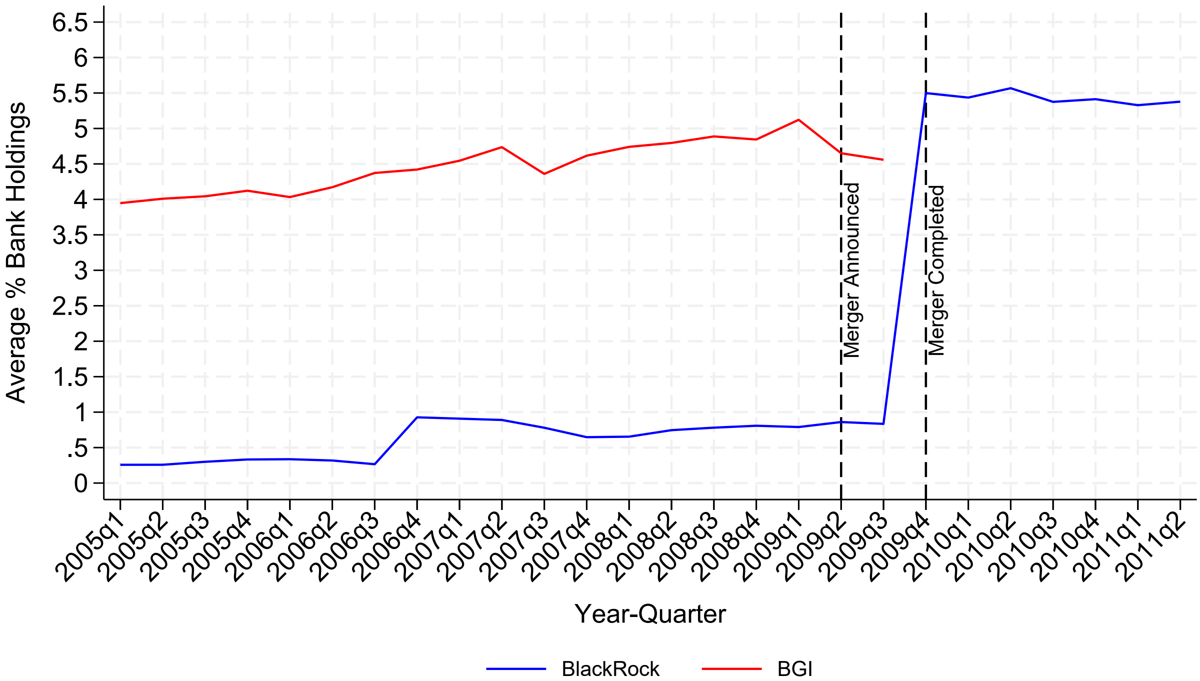
The table reports OLS regression estimates and t-statistics of Equation (10). The dependent variable is the percentage facility amount retained by each lead bank in the syndicate. The coefficients of interest are those on two measures of common ownership (CO): (i) average CO between the lead and member banks in a facility, as in Equation (2), and (ii) maximum common ownership across member banks in a facility, as in Equation (3). Columns (1) and (4) reports the baseline specification. Columns (2) and (5) excludes Term B and Leveraged loans. Column (3) and (6) replicates the baseline using the amount retained by the lead arranger computed following Blickle et al. (2020)'s approximation method. Standard errors are clustered by lead bank. All variables are defined in Table B.II in the Internet Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Figure B.1: **Distribution of CO^{avg} and CO^{max}**



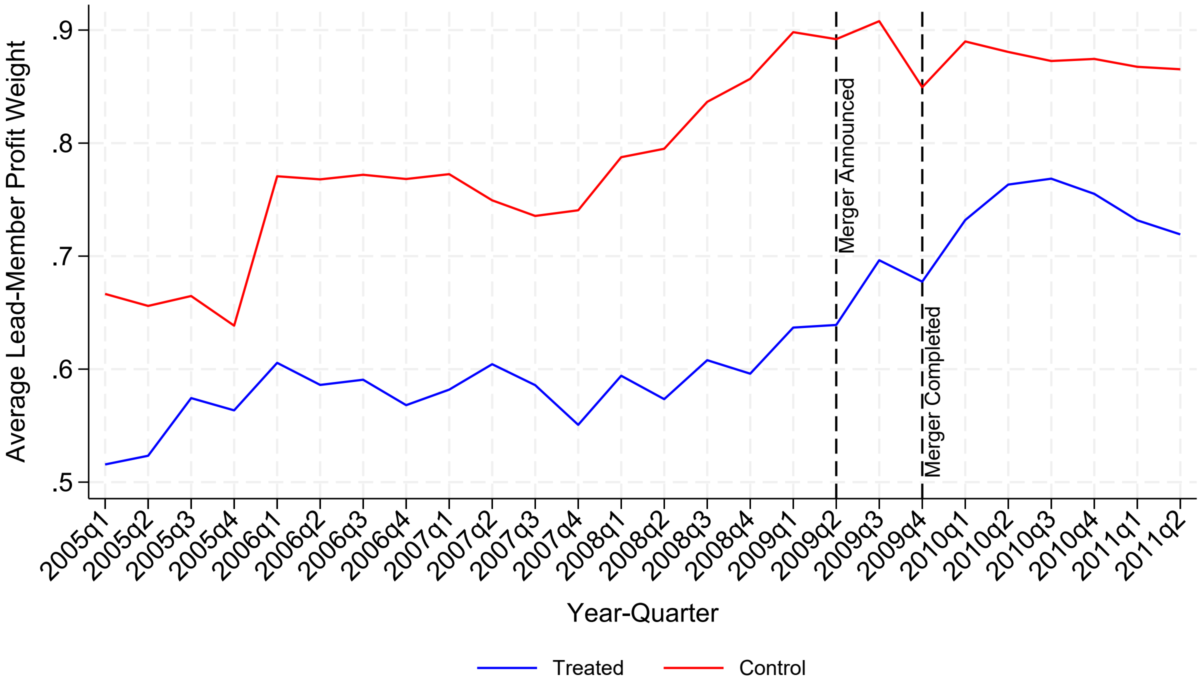
This figure shows the distribution, at a quarterly frequency between 1990 and 2017q1, of two alternative measures of common ownership among banks participating in the same syndicate. In particular: (i) the average common ownership between the lead arranger and member banks in a facility, as defined in Equation (2), and (ii) the maximum common ownership across member banks in a facility, as defined in Equation (3).

Figure B.2: **Average Blackrock and BGI bank holdings**



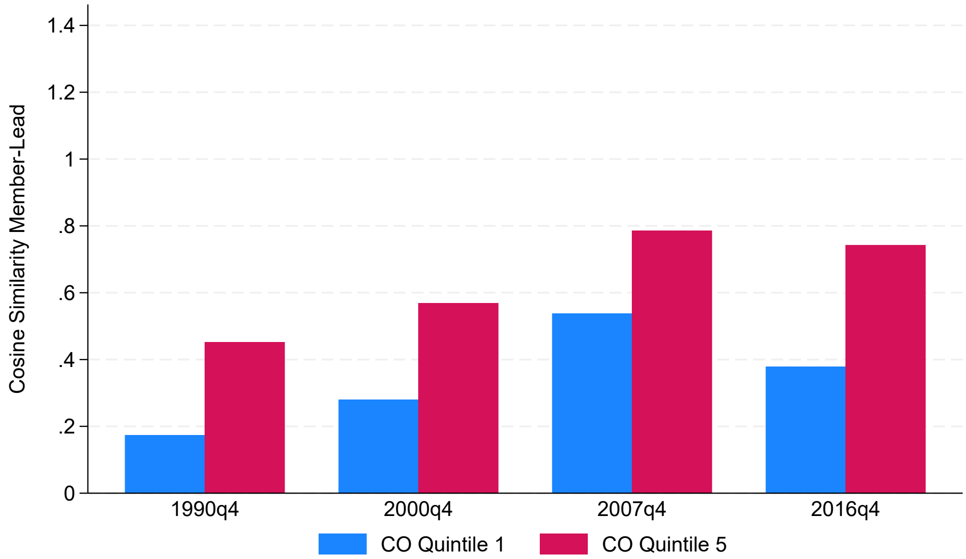
This figure displays the average holdings of U.S. banks in the syndicated loan market by BlackRock and BGI in the quarters surrounding their merger, which was announced in 2009Q2 and completed in 2009Q4.

Figure B.3: **Average common ownership between treated and control lead-member pairs**

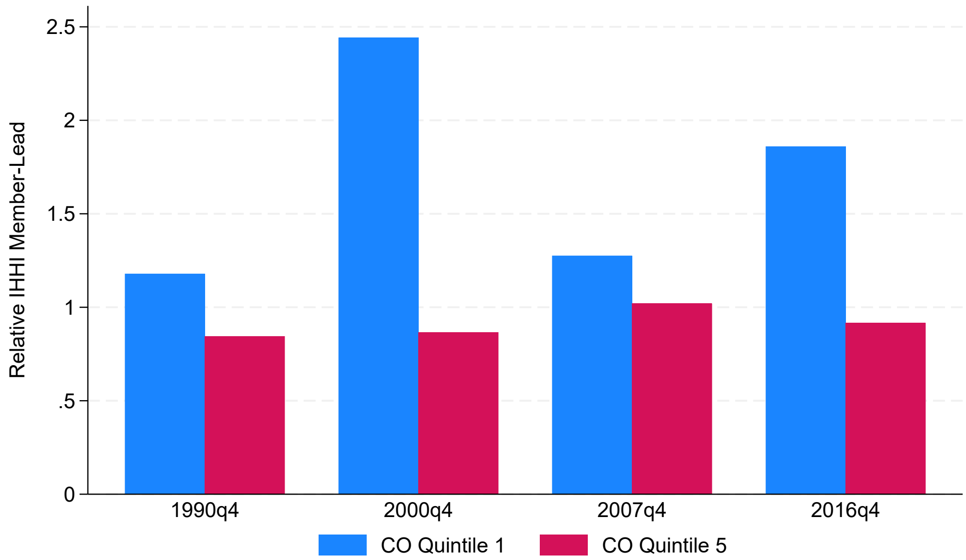


The figure depicts the evolution of average common ownership between lead–member pairs surrounding the BlackRock–BGI merger, which was announced in 2009Q2 and completed in 2009Q4. We classify treated pairs as those in the top tercile of the distribution of the implied change in common ownership resulting from the merger, while control pairs are defined as those in the bottom tercile.

Figure B.4: **Decomposition of member-lead common ownership measure**



(a) Cosine Similarity



(b) Relative IHHI

The figure reports the decomposition of the average values of syndicate common ownership (Member-Lead) for the highest and lowest quintile of the common ownership (Member-Lead) distribution over time. Syndicate common ownership (CO) is defined in Equation 2 and the decomposition in Equation 4.