Credit Conditions when Lenders are Commonly Owned

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Abstract

We investigate how common ownership between lenders affects the terms of syndicated loans. We conjecture that common ownership between lenders mitigates information asymmetries on the quality of the borrower. We theoretically and empirically show that high common ownership decreases loan rates, lowers the share of the loan retained by the lead bank, and mitigates rationing at issuance. Further investigations support the hypothesis that common ownership is an information transmission device: it especially affects the terms of loans to new borrowers, and, as information flows from the lead bank to syndicate members, member-to-lead common ownership does not affect credit conditions.

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 2013, the four largest U.S. asset managers (Blackrock, Vanguard, State Street, and Fidelity) held a combined 20% of the shares of the four largest commercial banks (JP Morgan, Citigroup, Bank of America, and Wells Fargo).

Common ownership affects credit conditions and credit availability in a complex way. Recent empirical work mainly focuses on a potential downside of common ownership: 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., 2022, 2018; He and Huang, 2017). In this paper, we focus on a new potential upside of common ownership: reducing information asymmetries in syndicate relationships. We refer to the asymmetric information between lenders that characterizes the syndicated loan industry, where lead banks possess an informational advantage on the borrower's risk profile relative to other participants and are tasked with loan monitoring. We conjecture that a lender with superior information, such as the lead bank in a syndicated loan, can truthfully transmit such information to another lender when the two are interconnected via a common shareholder. As common ownership eases information asymmetries, the lead bank does not need to signal the quality of the borrower to potential investors. Thus, common ownership may have positive effects on risk-pricing and credit availability for borrowers.

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 regarded as anticompetitive per se; however, lenders should not disclose sensitive information, collude, or otherwise harm the borrowers. The syndicated market has been subject to repeated investigations by the U.S., E.U., 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.

To investigate how common ownership between lenders affects credit conditions and credit availability, we proceed in two steps. First, we use a stylized 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.[1] 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

[1]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.

commit its own funds to the loan. By doing so, the lead bank signals the quality of the borrower to other potential lenders. As only some lead banks possess sufficiently large funds to signal the quality of the loan in the capital market, low common ownership will determine rationing at issuance. If, instead, common ownership is high, lending can take place at the conditions that would prevail with symmetric information. In sum, at high levels of common ownership: (i) the interest rate paid to the syndicate members is lower; (ii) the lead bank retains lower funds; and (iii) we observe less rationing at the issuance. Our model also allows us to show that our empirical results are inconsistent with alternative recent theories of common ownership and syndicated lending markets. In particular, models in which common ownership is a mechanism for incentive alignment (as in Antón et al. 2023), or in which the lead bank faces pipeline risk (as in Bruche et al. 2020) would yield different predictions.

In the second step, we empirically test these 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 a number of 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 price and composition of the syndicates 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.[2] 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.

Before testing our theoretical predictions, we present two pieces of motivating evidence. The first shows that common ownership changes the intensity of lending relations between syndicate members and borrowers. We show that, after subscribing a loan featuring a high degree of common ownership with the lead bank, a syndicate member increases its lending relationship with the borrower. This result holds within the same member-borrower relation over time. The second empirically documents a positive relationship between common ownership and the degree of overlap between directors sitting on the board of lenders; this fact supports the plausibility of information transmission between lenders, for example, through common directors, when common ownership is sufficiently high.

We find support for all three predictions in the data. First, high levels of common ownership between the lead bank and the syndicate participants are associated with lower prices. 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

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

fixed effects related to: the loan and the facility; the borrower; and the lead bank. In panel regressions, coefficient estimates indicate that an increase of one standard deviation in common ownership is associated with a lower spread of 5 basis points, where the average spread is 170 basis points. Based on conversations with industry experts, we learned that, in the presence of ownership overlap, a lead bank might selectively transmit pre-bid information to investors in order to convince them to subscribe to the loan at the margin. This explains the relatively small size of our estimates when considering the average impact of common ownership, and the larger nonlinear magnitudes when considering the intra-quintile effects (see below).

To rule out the possibility that variations in common ownership and spread may reflect omitted characteristics that systematically correlate with prices and common ownership levels, we estimate the effect of common ownership on the pricing of facilities of the same type *within* a given loan. The within-loan estimates confirm the negative effect on prices: an increase of one standard deviation in common ownership implies a reduction in spread of 8 basis points.

We then discretize our common ownership measure into five indicator variables corresponding to the quintiles of its support. All our estimates show that reductions in spread are relevant only for high levels of common ownership (quintiles 3 to 5), and that those reductions are monotonically increasing in common ownership. Within a quintile, a change in common ownership from the minimum to the maximum level reduces the price by roughly 7 to 15 basis points, where the average loan spread is around 195 points for the upper quintiles.

Second, we find that an increase of one standard deviation in common ownership is associated with a statistically significant 0.75 percentage point decrease in the amount of the loan retained by the lead bank. As the lead arrangers retain on average 13% of the loan amount, the impact of common ownership is sizeable. In analyzing the share of loan retained by the lead arranger, we explicitly account for the presence of originate-to-distribute loans and sample selection in reported shares, as highlighted in the recent literature: Blickle et al. (2020). In practice, we exclude all term B and leveraged loans from the analysis; 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. We correct for sample selection bias by modeling the probability of missing information.

Third, we find that common ownership impacts credit supply. We empirically compare the intensity of lending relationships between two types of lead arrangers: arrangers that experience a prevalence of loans with high common ownership in their portfolio in a given quarter, and arrangers that do not. Lead arrangers with a prevalence of high common ownership have stronger lending relationships: they underwrite 17% more loans in a quarter with respect to lead arrangers with a low prevalence and 65% more in terms of the amount.

We are careful to rule out alternative explanations to our findings. First, we explicitly control for vertical relations, namely common ownership between lenders and borrowers. Second, we use a selection model to empirically address the fact that lenders' decisions to enter the syndicate may depend, among other factors, on the level of common ownership with the lead arranger and other unobservables collected in the error term. Our results are not qualitatively different when accounting for selection.

We provide two additional pieces of evidence consistent with common ownership as a mechanism of information transmission. First, we exploit borrower heterogeneity in our data to empirically show that common ownership has an impact only in the case of new borrowers, as the lead arranger is more likely to hold an informational advantage over the syndicate members. Second, we 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 lead bank and syndicate members should have an impact on our outcome variables, not common ownership between syndicate members and lead bank. 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. Finally, 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., 2022, 2018; He and Huang, 2017).[3] We contribute to this literature by proposing a positive role of common ownership - so far overlooked in the literature - in reducing information asymmetries and distortions in credit conditions.

In related work, 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 (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. Finally, 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. In contrast to all these papers, we are the first to look at common ownership between lenders and its effect on credit terms. We find empirical evidence consistent with the results of a model in which, thanks to common ownership, the lead

[3] Boller and Scott Morton (2020) use 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 Gerakos and Xie (2019) analyze the effect of common ownership on entry. Antón et al. (2023) investigate how managerial incentives can link common ownership and competition. Aslan (2019) 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 Schmalz (2021) and Backus et al. (2020) provide a summary of the empirical evidence.

bank does not need to signal to other lenders in the syndicate the quality of the borrower by means of costly signals, such as the retention of a share of the loan. In all our specifications, we nevertheless account for relationships of common ownership between lenders and borrowers.

We also contribute to the literature on syndicated lending. We are the first to show that common ownership reduces the distortions of risk pricing and credit rationing that the previous literature shows to be caused by 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 syndicate is headed by the lead bank or arranger. 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 chosen 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. Syndicated loans are not considered to be a "security" under federal or state laws, as recently confirmed by the Southern District of New York in the case Kirschner v. JPMorgan Chase Bank, and loan syndication is not a "security distribution". As a consequence, 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 the presence of 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 contemporaneous presence of adverse selection and moral hazard. More recent work has documented that the market has seen an increase in the originate-to-distribute loans, especially in the non-investment grade loan segment targeted toward institutional investors: Bord and Santos (2012) and Bruche et al. (2020). If the lead arranger syndicates a loan with the intention of selling it immediately, pipeline risk, that is the risk that the loan becomes a "hung" deal, may arise when the market is not willing to absorb the loan under the conditions arranged by the lead bank: Bruche et al. (2020). Pipeline risk adds a layer of complexity that intersects with asymmetric information because, for originate-to-distribute loans, loan retention may be the result of pipeline risk. In the empirical section of the paper, we propose a falsification test to show that pipeline risk is unlikely to explain our results (see Section 6.2). We will also take into consideration this feature of the market in our empirical strategy (see Section 5.3.2).

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. 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 does not have an obligation 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. JP Morgan and the Bank of America arrange around 63% of the loans in the sample. 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 Black Rock, 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. A recent literature has contributed to clear the doubts regarding whether these investors exercise any influence on the firms they are invested in. Appel et al. (2016) and Brav et al. (2019) present evidence that institutional investors use their voting blocs to influence the governance of firms. In practice, asset managers may exert their control through "voice" (Edmans et al., 2019), by direct interventions, such as monitoring the managers, or by 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 has a direct impact on 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. Our conjecture is that common ownership facilitates the transmission of private information regarding the borrowing firms from the informed lead bank to the uninformed members of the syndicate. 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 information transmission may arise when the lead bank and syndicate members are commonly owned (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 between lenders via the common owner.

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 in order 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 interests between the bloc of lead bank and syndicate members and the creditor.

3 Hypothesis Development

Consider a penniless borrower who owns a project but lacks the financial resources to carry it out.[4] 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 members of the syndicate (M) operate in perfectly competitive financial markets and have the financial resources to fund the project. We denote by A, with $0 < A < 1$, the maximum amount of the loan that 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 $q < p$.[5] Independent of the

[4]This setting extends the model in Tirole, Chapter 6, which in turn uses the mechanism approach in Maskin and Tirole (1992) to solve the contract's design problem. In this section, we describe the model we use to derive our empirical predictions. See the Theoretical Appendix for the derivation of the formal results.

[5]The predictions of the model would not change if the lead bank had superior information on the cost of

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.[6]

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 positive, which makes it costly for the lead bank to signal the good type and achieve separation from the bad type. As a result of this assumption, a lead bank representing a good borrower would be strictly better off if it could truthfully disclose its information about the quality of borrowing.

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 $R_{j,L} + R_{j,M} = R$.[7] The sharing rule is complemented by two additional components. The first is a decision rule on whether the loan is extended by potential syndicate members to a firm of a given type $j = G, B$ ($x_j \in [0, 1]$). The second is the amount of cash that the lead bank L invests in the loan ($\mathcal{A}_j \leq A$).

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, the presence of alternative investment opportunities that are more remunerative than the borrower's project. We solve for the perfect Bayesian equilibrium of the contract design game. When solving the model, 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 M. Finally, all agents in the economy are risk neutral, the lead bank is protected by limited liability, and the risk-free interest rate is nil.

We solve the model under two scenarios: the first is the case without common ownership ($\kappa = 0$); while the second considers the case with common ownership ($\kappa > 0$). The lead bank can use common ownership to truthfully channel its private information regarding the borrower's probability of success to the commonly owned syndicate members. In other words, in this model common ownership is equivalent to an information transmission technology.

Funding without common ownership We first consider the case without common ownership ($\kappa = 0$). 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 a rent. In practice, this separating contract is unappealing to a bad borrower and allows the potential members to break

monitoring the borrower (see the discussion below).

[6]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.

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

even.[8] In the discussion below, we describe the merits of this choice (including the condition such that the equilibrium we focus on is the unique equilibrium of the signaling game).

In equilibrium, if potential syndicate members subscribe 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, it requires the lead bank L to pledge all its funds as a signal that it is confident about the good borrower's future returns ($\mathcal{A}_G = A$). Second, the reward to the lead bank L is determined by the mimicking condition of the bad type: the lead bank picks the largest repayment that makes the lead bank representing a bad type indifferent between accepting the contract targeting the good type 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 Consider now the case in which the lead bank places a weight $\kappa > 0$ on the utility of the commonly owned potential syndicate members. Specifically, there is a fraction of commonly owned potential syndicate members (M_{Co}) and a complementary fraction that are not commonly owned with the lead bank (M_{NCo}). In line with our empirical application, 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 model common ownership as an information transmission device. We say that information transmission can happen only if $\kappa \geq \underline{\kappa}$, and then empirically identify the threshold $\underline{\kappa}$ in the application. The lead bank can credibly channel its private information regarding the borrower's probability of success to the commonly owned syndicate members M_{Co}. As a consequence, M_{Co} are perfectly informed about the type of borrower. M_{NCo} observe the choice of the commonly owned syndicate members M_{Co}, and 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.

We construct an equilibrium in which the lead bank representing a bad borrower does not get access to 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 for $R_{G,M_{Co}} = R_{G,M_{NCo}} = 1/p$.

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 decision to accept or reject the offer. As a consequence, they accept the symmetric-information contract if the commonly owned investors M_{Co} 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

[8] 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 equilibrium of our game under a condition on the parameter α. If this condition is not satisfied, there may also exist pooling equilibria (see the discussion below).

upfront and get $1/p$ in the case of the project's success, or else the borrower goes bankrupt.

Empirical predictions We now list the empirical predictions of the model (see the Theoretical Appendix for their formal derivation). Our null hypothesis is that sufficiently high levels of common ownership facilitate information transmission.

Proposition 1. *Comparing the lending conditions (interest rate and amount of the loan retained by the lead bank) with and without common ownership, we find that:*

1. *The interest rate charged by syndicate members is lower with high common ownership than without common ownership;*

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

3. *Without common ownership, we observe rationing at issuance. We do not observe rationing at issuance with high common ownership;*

Absent common ownership, the separation of types 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 its 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 by means of a costly signal (loan retention). With high common ownership, instead, separation is achieved thanks to the channeling of the lead bank's private information to the commonly owned investors. Finally, for the third implication in the proposition, we assume heterogeneous lead banks with respect to the value of A that they can commit to the loan, so that only the lead banks with sufficiently large funds can offer the separating equilibrium contractual terms that avoid the breakdown of capital markets.

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 key difference we expect 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 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: it is unnecessary to retain a share of the loan or underprice the loan in the low-demand state.

The reversal of the source of asymmetric information results in a falsification 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), we should find the same effects as in our primary empirical analysis. However, this is different from our setting; 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 (from the lead arranger to investors) as a proxy for common ownership. In Section 6.2, we find no statistically significant effect under the falsification 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 shows that, under a condition on the value of prior beliefs α, which we implicitly make, the separating equilibrium we consider is the unique equilibrium of the model. Otherwise, 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.[9] 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. [10]

Common ownership To compute our common ownership measures, we use several sources. The primary one is the 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 have to report at quarterly frequency. We complement the Thomson Reuters S34 data with hand-collected 13F holdings from Backus et al. (2021b) and aggregate Blackrock holdings filed separately under different entities (Ben-David et al., 2021). We also use infor-

[9] 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".

[10] 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.

mation on the 13D/G filings assembled by Schwartz-Ziv and Volkova (2020) for large (above 5%) shareholders; we, therefore, take 13D/G filings into account when 13F disclosures are not applicable, for example when the assets are owned by individuals. 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 a minor effect on our common ownership measure; 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 to 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 syndicate member-facility-loan level.

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, 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:

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

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 $\gamma_{b_i s} = \beta_{b_i s}$.[11]

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

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

where $B_i \in [1, \overline{B}]$ is the number of syndicate members in each facility i. We consider other choices to aggregate profit weights between the lead bank and members at facility level, such as the median and mode, and find that estimation results remain unchanged. Finally, we repeat the same exercise to determine the degree of common ownership between: (i) borrowing firms

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

and banks; (ii) syndicate member to lead arranger; and (iii) syndicate members within each loan relationship. Measure (i) will be an additional control to account for the presence of common and cross ownership between vertically related firms. Measures (ii) and (iii) will be useful to run falsification tests 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:

$$\kappa_{ab_i}(\beta) = \underbrace{\cos(\beta_a, \beta_{b_i})}_{\text{overlapping ownership}} \cdot \underbrace{\sqrt{\frac{IHHI_{b_i}}{IHHI_a}}}_{\text{relative IHHI}}. \tag{3}$$

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 (3) 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 27,868 borrower-bank-loan-facility observations. We observe 17,430 loans granted to 3,988 firms between 1990 and the first quarter of 2017. We identify 70 lead banks. The average syndicate size is 10 members. Syndicates extend loans of \$1,180 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 1.8 facilities. The average facility spread is 170 basis points and the average amount \$685 million. 44% of loans are secured by collateral. Most facilities in our sample are credit lines (71%).[12] On average, lead banks retain 19.3% of the facility amount, and this variable is reported for around 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) hold 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 0.72 on the profits of the other syndicate members, with an increase from 0.44 in 1990 to 0.82 in 2017.

To interpret these patterns, we decompose the profit weights into overlapping ownership and relative investor concentration, see Equation (3). 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 the clear 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 increasing over time as common investor positions in lenders have become larger over time. 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.

[12] 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.

4.4 Motivating Empirical Evidence

We begin by documenting two key empirical facts. The first one shows that, after a loan deal with high common ownership between the lead bank and the syndicate member banks, those member banks present a stronger lending relationship with a given borrower with respect to lenders participating in a low common ownership deal with the same borrower. According to our model, as lenders in the high common ownership loan possess superior information on the creditworthiness of the borrower, they will be more likely to engage with that borrower afterward.

Second, we look at connected directors as a simple mechanism of information transmission across lenders. Indeed, we find a positive association between the degree of common ownership and connected directors.[13]

These facts provide suggestive evidence that common ownership can serve as a mechanism to overcome asymmetric information problems.

Common ownership and the intensity of lending relations We empirically compare the intensity of the lending relationship to a given borrowing firm between two types of lenders: lenders that experienced high common ownership with the lead bank and members that experienced low common ownership with the lead bank. We measure intensity in terms of number of deals and dollar amount. We first select a panel at syndicate member-borrower and year-quarter level according to three criteria: (i) a given borrower is granted at least two loans at the origination date, where one of the loans is characterized by a high level of common ownership and the other one by a low level of common ownership; (ii) borrowers are granted at least one loan before and after the loan origination date; and (iii) the loans are not refinancing loans. Second, for each borrower we calculate the total number of loan facilities and the total dollar amount of these facilities in which the same syndicate member participates before and after a given loan deal date, scaled by the borrower's total newly initiated number of loans or the loan amount during the same period. The before/after period covers 16 quarters, reflecting the average loan duration in our sample. We conduct the comparison between these two groups as follows:

$$Intensity\ Lending\ Relations_{fbt} = \beta_0 + \beta_1 I_{CO}^{H} I_t^{Post} + \beta_2 I_t^{Post} + \varepsilon_{fbt}, \tag{4}$$

where f indexes the borrower firm, b the syndicate member bank, and t indexes the quarter; I_{CO}^{H} takes a value of one for members in the loan with high common ownership and zero otherwise; ; I_t^{Post} takes a value of one after the date of the loan origination and zero otherwise. The coefficient of interest is β_1. Panel (a) of Table II reports the coefficient estimates of Equation (4), where the intensity of financial relationships between the borrower and the syndicate member is measured in the number of loans normalized by the total number of newly initiated loans. In the most saturated specification, with member-borrower, and year-quarter fixed effects (column 3), syndicate members in the high common ownership deal increase their participation after the origination date by 16 percentage points relative to the control group. When measuring

[13] 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).

the intensity of financial relationships in dollar amount (column 6), we find the same effect (an increase of 16 percentage points).

Connections between lenders and common ownership We investigate the association between common ownership and directorship interconnections (interlocks) in our setting. For each pair of lead bank-potential syndicate members, we define a director interlock as an indicator equal to one if: (i) at least one director sits on the boards of both banks; or (ii) at least one director from each bank in the pair serves on the board of a common third firm. Information on directors and their joint employment is retrieved from BoardEx, with yearly frequency, for the period 1999-2017.[14] We then describe the probability of director interlocks by regressing the indicator on a measure of common ownership and an extensive set of covariates capturing characteristics of the lender pair.

Table III presents the results of a linear probability model. We empirically document a positive relationship between common ownership and shared directors; that is, pairs of lead bank-potential syndicate members with higher levels of common ownership are more likely to exhibit interlocking directorships. 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 common directors are more likely at higher levels of common ownership. Our findings complement the work of Azar (2012), who provides descriptive evidence that firms with common owners are more likely to share directors, and Nili (2020), who documents the rise of so-called horizontal directors, serving on the boards of multiple companies within the same industry.[15]

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

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

[15] In a similar vein, 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 informational advantage that the connected bank retains over other banks.

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 the average weight that the lead bank a puts on the profits of other syndicate members present in a specific facility i, as defined in Equation (2). 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. 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. 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, 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 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 difference 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 or hold a certain reputation), 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 quarter-year fixed effects, interacted with the industry in which the borrower operates, the coefficient is 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 borrower and lead arranger level.

Before presenting the coefficient estimates, we assess the importance of each source of variation. We regress our common ownership measure 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. We find that the first component explains around 69.0% 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 24.9% of the variance in common ownership. The remaining 6.1% arises from differences in common ownership attributable to variation across facilities within a loan, and this is the variation that we will exploit in the within-loan specifications (see below).

5.1.2 Panel-regression Estimates

Table IV presents the estimation results for the coefficients of primary interest. Columns 1 and 2 of Table B.III in the Internet Appendix report the full set of coefficient estimates. The estimated coefficient indicates that an increase of one standard deviation in common ownership is associated with a lower spread of 5.07 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 IV shows that reductions in spread are relevant only for high levels of common ownership (quintiles 3 to 5, corresponding to 60% of the facilities in our sample), and those reductions are monotonically increasing in common ownership. 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 are not only statistically significant but also economically significant: within a quintile, a change in common ownership in a facility from the minimum to the maximum level reduces the price by 7 to 15 basis points. The average facility spread in quintiles 3, 4, and 5 of common ownership is around 195 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.IV in the Internet Appendix presents our empirical analysis that deals with pipeline risk.

First, in column 1, we exclude from our sample non-investment grade loans. Our results hold; an increase in common ownership decreases loan prices, with a smaller effect with respect to the main specification as asymmetric information plagues investment-grade loans to a lesser extent. Second, in column 2, 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 of the loan 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. Third, based on our theoretical model, high common ownership should be associated with lower average time-on-the-market as information asymmetries between the lead arranger and investors should be mitigated. The hypothesis is empirically verified, with a negative relationship between common ownership and time-on-the-market for non-investment grade loans, for which pipeline risk is most relevant (column 3).

Robustness The Internet Appendix contains the results of several robustness tests. Table B.V reports the same empirical specification using an alternative definition of common ownership as the average of the minimum commonly held shares between the lead arranger and the syndicate members (Newham et al., 2022). Here, the parameter estimates suggest an even stronger effect of common ownership on spread.

Our results are also 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 resulting coefficient has roughly the same magnitude. 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.[16] 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, larger 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.

Finally, we consider the pricing structure of loans more holistically, particularly the comprehensive total-cost-of-borrowing measure developed by Berg et al. (2016), which accounts for fees, spreads, and the likelihood that they will have to be paid. Fees are used to price options included in loan contracts and to screen borrowers, as those borrowers self-select into a specific fee structure based on private information. Column 6 of Table B.III shows that our results are robust when using this alternative measure of the cost of debt.

5.1.3 Within-loan Estimates

We now focus on pricing differentials between different facilities of the same type *within* a loan with varying degrees of common ownership. This identification strategy was first used by Ivashina and Sun (2011) and later adopted by Lim et al. (2014). It rules out the possibility that

[16]Following Degryse et al. (2019), we prefer the use of quarter-year-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.

the variation in spread associated with common ownership reflects omitted characteristics related, for example, to borrower risk that systematically correlates both with price and common ownership. As a credit event on one or more facilities within a loan triggers the default of the entire loan (loans with split control rights are removed from the sample), facilities of the same type and in the same loan essentially reflect the same underlying risk characteristics. We also control for any other remaining differences across facilities of the same type (size and maturity) that may influence their pricing.

We exploit the variation in pricing arising from the set of 463 loans with multiple facilities of the same type. We estimate Equation (5) on this subsample, with results reported in columns 3 and 4 of Table IV. The estimates again confirm our hypothesis that price reduces as common ownership increases. Our estimates imply a spread reduction of an even greater magnitude with respect to the above estimation; that is, within a quintile, a change in common ownership in a facility from the minimum to the maximum level reduces the spread by roughly 20 basis points.

An even more demanding test of the hypothesis comes from cases in which we have the contemporaneous presence of facilities of the same type displaying high and low common ownership within a particular loan. We only have 135 facilities satisfying the requirement, so we run into issues of small sample size. Nevertheless our results hold: Table B.VI shows that when common ownership is high, syndicate members receive a lower spread on the particular facility relative to a facility with low-common ownership, and the coefficient magnitude is consistent with the above specifications.

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:

$$Percent\ Lead\ Amount_{iat} = \beta_0 + \beta_1 CO_{iat} + \beta_2 X_{iat} + \varepsilon_{iat}, \tag{6}$$

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.

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 from the analysis; 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 correct for sample selection bias using a probit selection equation ((Wooldridge, 2010)). In particular, we model the probability of missing information on the retained share for a specific loan as a function of the reported retained shares on the total number of loans syndicated by the same lead arranger in the previous quarter. In the selection equation, we also use loan and lead arranger characteristics included in the estimating Equation (6).[17]

5.2.2 Coefficient Estimates

Prediction 2 implies that β_1 is negative. Table V presents the coefficient estimates of Equation (6): column 1 of Table V reports 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; column 2 reports the effect excluding all term B and leveraged loans from the sample; and column 3 reports the effect accounting for selection and excluding term B and leveraged loans. Table B.VII in the Internet Appendix reports the full set of coefficient estimates, including the ones related to the selection equation (the probit).

The coefficient estimates of our preferred specification (column 3) indicate that an increase of one standard deviation in common ownership as measured by CO_{iat} implies a 0.75 percentage point decrease in the amount retained by the lead bank, holding all other variables constant at their mean values. Lead arrangers retain on average 13% of the facility amount for the sample excluding term B and leveraged loans. We therefore find empirical support for our hypothesis of reduction in the amount retained by the lead bank for each facility when common ownership is sufficiently high.

5.3 Rationing

5.3.1 Empirical Design

According to Prediction 3 of Proposition 1, we expect to observe rationing at issuance with low levels of common ownership, as lead arrangers need to commit larger funds in the loans and their funding resources are limited. On the contrary, as lead banks with high common ownership do not need to signal their type of borrower by committing funds in the loans, they should be able to fund multiple and larger projects. We test the prediction by empirically comparing the intensity of lending relationships between two types of lead arrangers: first, arrangers that in a given quarter experience a prevalence of loans with high common ownership in their portfolio; and

[17] In the selection equation, we exclude lead arranger fixed effects to avoid endogeneity issues.

second, arrangers with fewer loans in high common ownership in their portfolio. We define I_{CO}^{H} taking a value of one for lead arrangers with more than 60 percent of the loans in high common ownership and zero with 40 to 60 percent of the loans in high common ownership. We exclude lead arrangers with loans that always present a low level of common ownership (quintiles 1 to 3). Doing so ensures that the two groups that we are comparing present similar characteristics. For the four bank-related variables (bank leverage, profitability, size, and market equity), we verify that the differences between the two groups (high and low common ownership in the portfolio) are low. In particular, we use the normalized differences in the average values; we find test statistics between 0.01 and 0.17 for the variables, well below the rule of thumb of one quarter suggested by Imbens and Wooldridge (2007) and Imbens and Wooldridge (2009). In other words, we select two groups of lead arrangers whose difference in the level of common ownership in a quarter is driven by quasi-random circumstances tied to the differences in fund inflows of potential investors, which in turn determines a slightly different composition in the syndicate and, as a consequence, the level of common ownership in their portfolio.

Following Jiang et al. (2010), we measure the intensity of lending relationships in terms of the number of deals and the dollar amount, both normalized by the size of the lead arranger. We conduct the comparison between these two groups and test Prediction 3 by estimating the following equation:

$$Intensity\ Lending\ Relations_{at} = \beta_0 + \beta_1 I_{CO}^{H} + \beta_2 X_{at} + \varepsilon_{at}, \tag{7}$$

where the dependent variable is the number of loans or the dollar amount underwritten by a lead bank a in quarter t normalized by the lead bank size. In all specifications, we include lenders' related controls such as size, capital, profitability, and quarter-year fixed effects.

5.3.2 Coefficient Estimates

Prediction 3 implies that β_1 is positive. Table VI presents the estimations of Equation (7). Based on the regression results, lead arrangers with a prevalence of high common ownership in their portfolio underwrite 0.17 more loans in a quarter than lead arrangers with a low prevalence, or \$492 in terms of amount (columns 1 and 2). The median number of loans is 0.9 and the median amount is \$751 (both figures are normalized by the size of the lead arranger). In other words, lead banks with a prevalence of high common ownership underwrite 17% more loans in a quarter on average than lead banks with low prevalence, or 65% more in terms of amount.

Finally, we consider a specification with all lead arrangers present in the sample, and add lead bank fixed effects to account for persistent differences across lead arrangers. Columns 3 and 4 report the results of the specifications; results are robust to this alternative specification.

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 quintiles 3 to 5. Within a quintile, an increase in common ownership from the minimum to the maximum level implies a reduction in spread corresponding to 5.5 basis points in quintile 3, 12.7 basis points in quintile 4, and 16.9 basis points in quintile 5. 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 the results of a falsification test that leverage the testable implications of our hypothesis of common ownership as a mechanism of information transmission *from* the lead *to* the member banks. The falsification 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 entirely driven by differences in relative investor concentration.[18] Such asymmetry is a feature of 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 allows us to conclude that pipeline risk is unlikely to explain our results. In the demand-discovery model of Bruche et al. (2020), it is the market that holds superior information. Thus, if common ownership mitigates pipeline risk through the transmission of information from the investors to the lead bank on the demand state, then the falsification test we propose here should give the same results as in our main analysis.

We estimate Equation (5) and Equation (6) by regressing both the all-in-drawn spread and the amount of loan retained by the lead on our measure of average common ownership between

[18] In the Internet Appendix, we provide a decomposition of the profit weights member-lead into cosine similarity and relative lender concentration: see Equation (3). Figure B.1 shows the results. Panel (a) shows that the cosine similarity member-lead is identical to the lead-member, as reported in Figure 2. Panel (b) depicts the relative concentration of lenders in the measure of common ownership member-lead, which differs from Panel (c) of Figure 2.

the lead arranger and syndicate members in a facility (CO_{ia}), as before, and a measure of the average common ownership between syndicate members and the lead arranger in a facility (CO_{ib}). 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 common ownership lead-member (CO_{ia}) is practically unchanged. Most importantly, the coefficient of common ownership member-lead (CO_{ib}) is small in magnitude and not statistically different from zero.

7 Common Ownership and Syndicate Participation

Our variable of interest (that is, common ownership) is a function of the syndicate structure, namely the set of lenders participating in the syndicate. As the lender's decision to enter the syndicate is not random and may depend, among other factors, on the level of common ownership with the lead arranger and other unobservables collected in the error term, 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 on the riskiness of the borrower, as follows:

$$Spread^r_{iabt} = \gamma_0 + \gamma_1 \kappa_{iabt} + \gamma_2 X_{iabt} + \upsilon_{iabt}, \tag{8}$$

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, we omit the subscript for the borrowing firm to simplify the 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 a slightly different version of the definition of $Spread_{iat}$ in Equation (5), the inequality can be expressed as follows:

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

The participation equation is therefore:

$$p_{iabt} = 1[\delta_0 + \delta_1 \kappa_{iabt} + \delta_2 X_{iabt} + \eta_{iabt} > 0]. \tag{9}$$

The resulting outcome equation is:

$$\begin{aligned} Spread_{iat} &= \beta_0 + \beta_1 \kappa_{iabt} + \beta_2 X_{iat} + \varepsilon_{iabt} \text{ if } p^*_{iabt} > 0 \\ &= \text{not observed if } p^*_{iabt} \leq 0, \end{aligned} \tag{10}$$

where we modify Equation (5) to use a more granular unit of observation at member-facility level rather than facility level as in the main specification.[19] Clearly, 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.

While the sample selection model is theoretically identified without any restriction on the regressors, we use exclusion restrictions to allow for the identification of the parameters attributable to variation in the data rather than parametric assumptions. We argue that the following variables should impact participation, but should not affect the resulting prices: (i) the characteristics of potential members (except for the profit weight κ_{iabt}); and (ii) a variable capturing the portfolio similarity between the potential member and the lead (Euclidian distance). Interest rates are a function of a variety of determinants linked to the lead bank, the borrower and the loan, but the characteristics of potential members should not directly influence the final price. Within the characteristics of potential members, we include trading liquidity of potential members as a determinant of equity ownership by mutual funds. While the validity of exclusion restrictions cannot be directly tested, we perform numerous sensitivity analyses and the results do not change. Finally, all the variables included in the outcome equation are also present in the participation equation.

Table IX presents the results without the correction for selection (column 1) and with the correction (columns 2 and 3). Results from the selection model indicate that participation is not random. Table IX presents the results using the full sample of observations. In column 2, we present the results of the participation equation. As expected, potential members with higher common ownership with the lead bank are more likely to enter the syndicate, confirming that high levels of common ownership can mitigate information asymmetries. As those potential members are more aware of investment opportunities, or hold superior information to other

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

uninformed participants, their reservation price is lower, and they are more likely to participate in the syndicate. Other statistically important drivers of participation include the level of common ownership between the potential member and the borrower (positive), and the portfolio distance between the lead and the member (negative).

We find evidence of selection, with a significant sample selection term, λ, and an implied correlation coefficient of 0.16. We have unobserved attributes that positively affect both the probability of participating in the syndicate and the prices offered to the syndicate members. These results do not appear to be different from those without correction, especially with regard to the impact of common ownership on prices. 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.

8 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 novel hypothesis is that high levels of common ownership facilitate the transmission of private information on the borrowing firms between the lead bank and other members of the syndicate. Common ownership is therefore a tool to ease information asymmetries.

We propose a signaling model in which a lead bank detains private information on the riskiness of a project while seeking funding to finance it. Signaling is costly in that it requires a larger commitment of funds by the lead bank. We conjecture that common ownership allows the lead bank to credibly transmit information about the borrower, and solve the model accordingly. The model provides three empirical predictions. At higher levels of common ownership: (i) the interest rate paid to the syndicate members is lower; (ii) the lead bank retains lower funds; and (iii) we observe less rationing at the issuance.

We use data on the syndicated loan market to empirically verify these predictions and find empirical support for all of them. Our identification strategy leverages the cross-sectional variation in the level of common ownership arising from differences in the composition of the syndicate both across facilities within a loan and across loans. An increase of one standard deviation in common ownership between the lead arranger and members of the syndicate is associated with a decrease equal to 5 basis points in interest rates (the average spread is 170 basis points) and 0.75 percentage points in the amount retained by the lead (the lead arranger retains on average 13% of the loan amount). Lead arrangers with a prevalence of high common ownership in their portfolio experience stronger lending relationship. They underwrite 17% more loans in a quarter with respect to lead arrangers with a low prevalence, and 65% more in terms of the amount. These results are robust to a variety of robustness and falsification tests.

Regulators recognize that common ownership can be conducive to 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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Table I: **Summary statistics**

	Mean	Std.Dev	p25	p50	p75	Obs.
			Loan Variables			
All-in-Drawn Spread	170	107	100	150	225	27,868
CO	0.720	0.180	0.630	0.760	0.840	27,868
CO Member-Borrower	0.480	0.350	0.070	0.550	0.770	27,868
Facility Amount $M	684.9	1,293.7	150.0	345.0	760.0	27,868
Loan Amount $M	1,180.4	2,187.3	250.0	600.0	1,350.0	27,868
Lead Amount	19.3%	15.1%	9.1%	14.0%	25.0%	12,165
# Facilities within Loan	1.840	1.090	1.000	2.000	2.000	27,868
Log Maturity	3.810	0.600	3.610	4.090	4.090	27,868
Secured Loan	0.440	0.500	0.000	0.000	1.000	27,868
Refinancing	0.720	0.450	0.000	1.000	1.000	27,868
Log Number of Members	2.170	0.700	1.790	2.200	2.640	27,868
Guarantor	0.110	0.310	0.000	0.000	0.000	27,868
Relationship Score	0.040	0.020	0.030	0.040	0.040	27,868
New Lending Relation	0.500	0.500	0.000	0.000	1.000	27,868
LIBOR 3M	0.020	0.020	0.000	0.010	0.050	27,868
Non-Bank Synd. Member	0.200	0.400	0.000	0.000	0.000	27,868
Prob. Default	0.030	0.120	0.000	0.000	0.000	27,868
Stock Volatility	0.380	0.180	0.260	0.340	0.450	27,868
Credit Line	0.710	0.460	0.000	1.000	1.000	27,868
Term Loan	0.290	0.460	0.000	0.000	1.000	27,868
			Borrower Variables			
Size	7.890	1.610	6.780	7.830	8.950	27,868
ROA	0.100	0.070	0.060	0.090	0.130	27,868
Book Leverage	0.330	0.200	0.200	0.310	0.440	27,868
Tangibilities	0.300	0.230	0.120	0.240	0.450	27,868
Tobin's Q	1.780	0.950	1.220	1.520	2.000	27,868
Log Int. Cov.	2.230	0.960	1.580	2.100	2.730	27,868
Liquidity Ratio	0.070	0.070	0.010	0.040	0.090	27,868
Unrated Borrower	0.340	0.470	0.000	0.000	1.000	27,868
High Yield	0.660	0.470	0.000	1.000	1.000	27,868
Investment Grade	0.340	0.470	0.000	0.000	1.000	27,868
			Bank Variables			
Lead Size	13.480	1.160	12.620	13.920	14.470	27,868
Lead Market Equity	0.120	0.060	0.080	0.110	0.150	27,868
Bank Book Equity	0.080	0.020	0.070	0.090	0.100	27,868
Lead Book Leverage	0.250	0.100	0.200	0.240	0.290	27,868
Lead ROA	0.010	0.000	0.010	0.010	0.010	27,868

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: **Lending intensity to a borrower with loan with high versus low common ownership**

	(1) # Loans	(2) # Loans	(3) # Loans	(4) Amount	(5) Amount	(6) Amount
Member CO High	0.093	0.075	-0.076**	0.102*	0.083	-0.076**
	(1.643)	(1.507)	(-2.202)	(1.777)	(1.613)	(-2.065)
Post	-0.133**	-0.142***	-0.151***	-0.113*	-0.125**	-0.140**
	(-2.459)	(-2.755)	(-2.678)	(-1.947)	(-2.230)	(-2.285)
Member CO High X Post	0.133*	0.138**	0.161**	0.126*	0.132*	0.162**
	(1.966)	(2.099)	(2.234)	(1.748)	(1.885)	(2.091)
Year-Quarter of Loan FE	Yes	Yes	Yes	Yes	Yes	Yes
Member FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower FE	No	Yes	Yes	No	Yes	Yes
Member X Borrower FE	No	No	Yes	No	No	Yes
Observations	826	826	820	806	806	801
Adjusted R-squared	0.105	0.116	0.207	0.106	0.116	0.202

The table reports the OLS regression parameter estimates and t-statistics of Equation (4). The dependent variable is number of loan underwritten by a syndicate member normalized by the total newly initiated number of loans (Column 1-3) and the amount of loan underwritten by a syndicate member normalized by the total newly initiated number of loans (Column 4-6). The coefficient of interest is the one of *Member CO High X Post*, an indicator variable taking the value of one for syndicate members in the loans with high common ownership and after the date of the loan origination. Standard errors are clustered by lender and year-quarter. 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 III: **Board connections and common ownership**

	(1)	(2)	(3)	(4)
CO	0.202***	0.054**	0.152***	0.076**
	(6.675)	(2.049)	(3.954)	(2.027)
Distance Lead-Member		-0.156***	-0.153***	-0.079*
		(-4.368)	(-3.291)	(-1.934)
Relationship Lead-Member		0.249***	0.225***	0.203***
		(6.182)	(5.830)	(5.684)
Lead Size		0.053***		
		(5.394)		
Lead Market Equity		0.024		
		(0.233)		
Lead Book Leverage		0.076*		
		(1.681)		
Lead ROA		0.525		
		(0.642)		
Member Size		0.059***	0.073***	0.049
		(8.858)	(10.884)	(1.624)
Member Market Equity		0.121	-0.085	-0.338***
		(1.419)	(-0.934)	(-2.664)
Member Book Leverage		0.088*	-0.078	-0.029
		(1.887)	(-1.602)	(-0.336)
Member ROA		-0.020	-0.123	0.479
		(-0.026)	(-0.147)	(0.669)
Year FE	No	No	No	No
Lead X Year FE	No	No	Yes	Yes
Member FE	No	No	No	Yes
Observations	10,405	10,126	10,126	10,126
Adjusted R-squared	0.018	0.119	0.184	0.214

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. *Distance Lead-Member* is the portfolio distance between the lead bank and the syndicate participant in the previous four quarters, *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 member bank. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Table IV: **Interest rates**

	Full Sample		*Same Facility Type - Same Loan*	
	(1)	(2)	(3)	(4)
CO	-26.647***		-44.447**	
	(-4.008)		(-2.235)	
CO Quintile 2		-2.657		-1.275
		(-0.732)		(-0.155)
CO Quintile 3		-8.853**		-19.660**
		(-2.151)		(-2.061)
CO Quintile 4		-10.584***		-23.596**
		(-3.057)		(-2.492)
CO Quintile 5		-15.627***		-23.182**
		(-3.762)		(-2.134)
Loan Purpose FE	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes
Year-Quarter FE	No	No	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	No
SIC2 X Year-Quarter FE	Yes	Yes	No	No
Observations	25,466	25,466	1,431	1,431
Adjusted R-squared	0.790	0.790	0.723	0.724

The table reports the OLS regression parameter estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). The specification also controls for facility-loan, lender, and borrower characteristics. Standard errors are clustered by lead bank. 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 V: **Facility amount retained by the lead bank**

	(1) Full Sample	(2) Exclude Term B And Leveraged	(3) Selection
CO	-2.698***	-2.965*	-4.641**
	(-2.874)	(-1.897)	(-2.134)
Loan Purpose FE	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes
SIC2 X Year-Quarter FE	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes
Observations	8,110	2,753	2,746
Adjusted R-squared	0.743	0.805	0.804

The table reports the OLS regression parameter estimates and t-statistics of Equation (6). The dependent variable is the percentage facility amount retained by each lead bank in the syndicate. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). The specification also controls for facility-loan, lender, and borrower characteristics. Standard errors are clustered by lead bank. 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 VI: **Rationing**

	CO Threshold [0.4,0.6];(0.6,max(CO)]		CO Threshold [0,0.5];(0.5,max(CO)]	
	(1)	(2)	(3)	(4)
	# Loans	Amount Lent	# Loans	Amount Lent
CO High Lead	0.168**	492.425***	0.156***	274.182***
	(2.243)	(4.631)	(3.571)	(4.197)
Bank Size	1.094***	1,191.518***	0.630***	505.464***
	(19.674)	(14.818)	(9.573)	(7.336)
Bank Market Equity	-6.533***	-6,439.994***	-0.079	619.380
	(-5.516)	(-3.907)	(-0.212)	(1.588)
Bank Book Leverage	-4.882***	-3,053.603***	-0.123	654.518**
	(-13.318)	(-6.554)	(-0.660)	(2.149)
Bank ROA	2.842	-9,600.885	-5.272*	-11,042.869***
	(0.307)	(-0.758)	(-1.868)	(-2.827)
Year-Quarter FE	Yes	Yes	Yes	Yes
Lead FE	No	No	Yes	Yes
Observations	477	477	1,861	1,861
Adjusted R-squared	0.706	0.683	0.768	0.664

The table reports the OLS regression parameter estimates and t-statistics of Equation (7). The dependent variable is the number of loans (odd columns) and the dollar amount (even columns) underwritten by a lead bank in a quarter, normalized by the lead bank size. The coefficient of interest is the one of *CO High Lead*, an indicator variable taking the value of one for lead arrangers with prevalence of high common ownership in their portfolio and zero otherwise. The specification also controls for lead bank characteristics and year-quarter fixed effects. Standard errors are clustered by year-quarter. 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 VII: **Interest rates and common ownership - New versus repeated borrowers**

	(1)	(2)	(3)	(4)
	New Borrower		Repeated Borrower	
CO	-29.407***		-6.518	
	(-3.147)		(-0.936)	
CO Quintile 2		-4.906		-2.222
		(-1.242)		(-0.587)
CO Quintile 3		-8.221*		-9.438*
		(-1.999)		(-1.818)
CO Quintile 4		-16.644***		-6.238
		(-3.649)		(-1.282)
CO Quintile 5		-19.553***		-6.419
		(-4.329)		(-1.418)
Loan Purpose FE	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
SIC2 X Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	12,685	12,685	12,653	12,653
Adjusted R-squared	0.729	0.730	0.744	0.744

The table reports the OLS regression parameter estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). Column (1) and (2) contain loans issued to new borrowers. Column (3) and (4) report the effect of syndicate common ownership on facility spreads for repeated lending relations. Standard errors are clustered by lead bank. 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 VIII: **Falsification test: common ownership member-lead and member-member**

	(1) Spread	(2) Spread	(3) Lead Amount	(4) Lead Amount
CO Member-Lead	-6.472	-6.753	-1.549	0.830
	(-0.801)	(-0.834)	(-0.933)	(0.492)
CO Lead-Member	-26.626***		-2.326**	
	(-3.962)		(-2.415)	
CO Quintile 2		-2.335		-2.463**
		(-0.637)		(-2.526)
CO Quintile 3		-8.515**		-4.713***
		(-2.064)		(-3.439)
CO Quintile 4		-10.295***		-3.920**
		(-2.934)		(-2.628)
CO Quintile 5		-15.397***		-4.494***
		(-3.650)		(-2.829)
Loan Purpose FE	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	No
SIC2 X Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	25,420	25,420	8,083	8,066
Adjusted R-squared	0.791	0.791	0.742	0.742

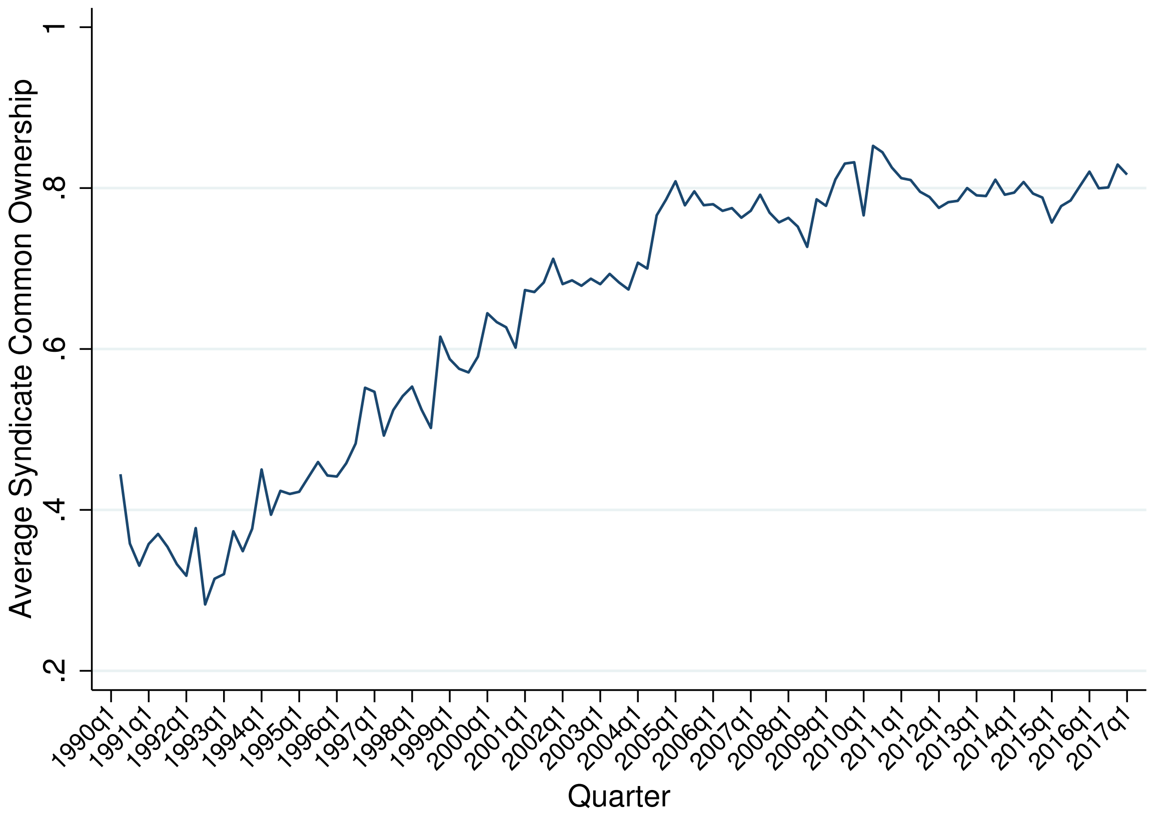
The table reports the OLS regression parameter estimates and t-statistics of Equation (5) in Column (1) and (2) and Equation (6) in Column (3) and (4). The dependent variable is facility loan spread (Column 1 and 2) and the percentage of loan retained by the lead bank (Column 3 and 4). The coefficient of interest is the one on *CO Member-Lead*, a measure of common ownership between the member and the lead in the same facility. The specification also controls for facility-loan, lender, and borrower characteristics. Standard errors are clustered by lead bank. 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 IX: **Interest rates: selection into the syndicate**

	No Selection	Heckman Selection	
	(1) Spread	(2) Member	(3) Spread
CO	-5.322**	0.105**	-5.382***
	(-2.090)	(1.983)	(-4.734)
λ			8.828**
			(2.364)
Loan Purpose FE	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes
SIC2 FE	Yes	Yes	Yes
Member FE	Yes	Yes	Yes
Observations	75,778	75,544	75,544

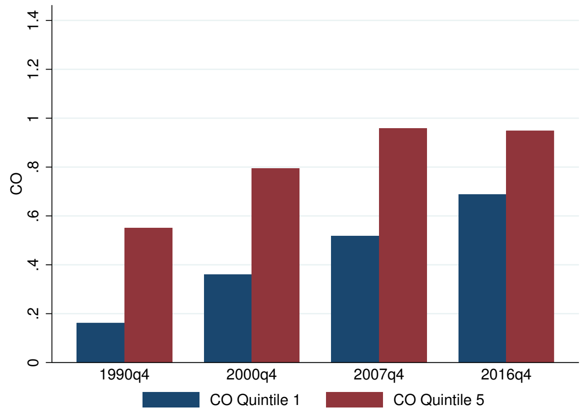
The table reports the the regression parameter estimates and t-statistics of a one-step OLS estimation of Equation (10) (Column 1) and a two-step estimation of Equation (9) and Equation (10) accounting for sample selection (Column 2 and 3). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks given in Equation (1). The specification also controls for facility-loan, syndicate member bank, and borrower characteristics. 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% level, respectively.

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

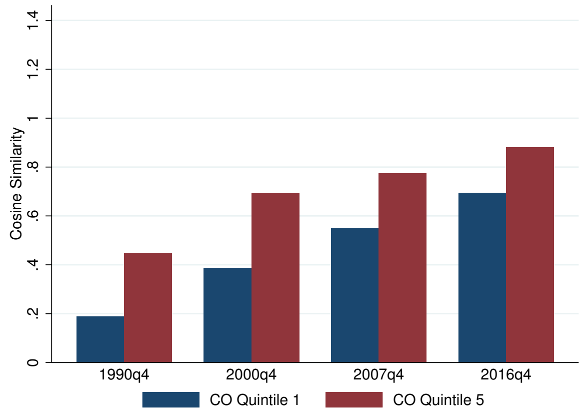


This figure reports the average common ownership among banks in the same syndicate between 1990 and 2017q1 at a quarterly frequency. Common Ownership is defined as the average profit weights between the syndicate lead-arranger(s) and the syndicate members.

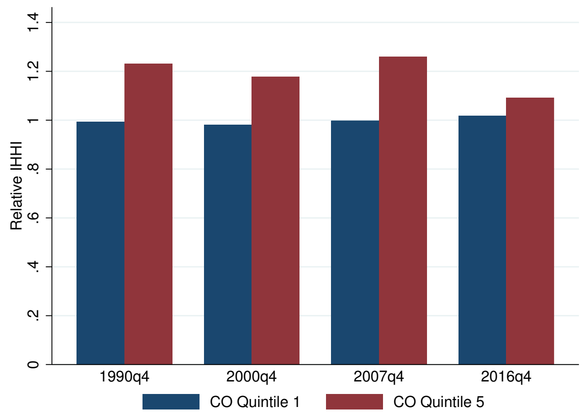
Figure 2: **Decomposition of lead-member common ownership measure**



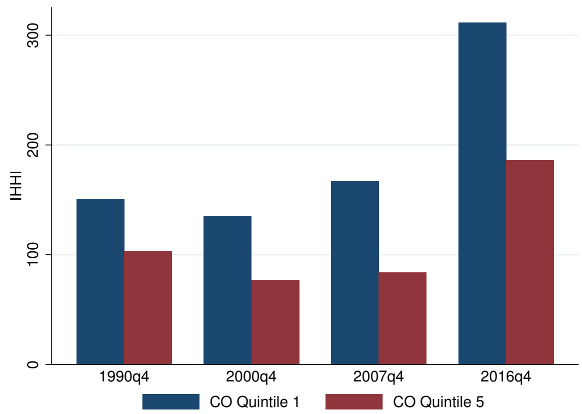
(a) CO



(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 3. 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.

Theoretical Appendix

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 that owns a project but lacks 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 members of the syndicate (M) operate in perfectly competitive financial markets and have the financial resources to fund the project. A, with $0 < A < 1$, is the maximum amount of the loan that 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. At 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 $j \in \{G, B\}$.[20]

L holds all the bargaining power. It designs contracts that can be accepted or rejected by

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

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 on its own utility. As a consequence, the lead bank would have the incentive 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.[21]

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 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.

[21] 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).

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.

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 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 hods true under Assumption 1.(A.2). □

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.[22] 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 $\hat{\alpha}$; they depend on the contract offer (including the decision by M_{Co}, μ).
4. Given $\hat{\alpha}$, M_{NCo} decide whether to accept or reject L's offer.

We first show that any equilibrium contract must feature the acceptance decision of M_{Co}. In particular, we prove that the the utility of a lead bank L representing type j increases in μ_j. Take the objective function of L:

$$\mathcal{M}_{j,L}(c_j) \equiv x_j \omega_j R_{j,L} - \mathcal{A}_j + \mu_j \theta \kappa [x_j(\omega_j R_{j,M} - 1) + \mathcal{A}_j]$$

[22] 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).

where $\omega_G = p$ and $\omega_B = q$. Consider two rewards $R_{j,M}$ and $\tilde{R}_{j,M}$ such that

$$\mu_j R_{j,M} = \tilde{\mu}_j \tilde{R}_{j,M}, \tag{A.9}$$

where μ_j and $\tilde{\mu}_j$ are the probabilities that M_{Co} accept when their reward is $R_{j,M}$ and $\tilde{R}_{j,M}$, respectively, with $\mu_j > \tilde{\mu}_j$ and $R_{j,M} < \tilde{R}_{j,M}$. Since $R = R_{j,L} + R_{j,M}$, setting $R_{j,M} < \tilde{R}_{j,M}$ implies that $R_{j,L} > \tilde{R}_{j,L}$. Hence,

$$\mathcal{M}_{j,L}(c_j) \geq \mathcal{M}_{j,L}(\tilde{c}_j),$$

where $\tilde{c}_j = (\tilde{\mu}_j, x_j, \tilde{R}_{j,L}, \tilde{R}_{j,M}, \mathcal{A}_j)$.

Moreover, Condition (A.9) implies that considering $R_{j,M}$ or $\tilde{R}_{j,M}$ does not affect the participation constraint of M_{Co}:

$$\mu_j \theta[x_j(\omega_j R_{j,M} - 1) + \mathcal{A}_j] \geq 0,$$

because $\mu_j \theta[x_j(\omega_j R_{j,M} - 1) + \mathcal{A}_j] = \tilde{\mu}_j \theta[x_j(\omega_j \tilde{R}_{j,M} - 1) + \mathcal{A}_j]$. All this means that a higher value of μ_j increases the utility of L and leaves the participation constraint of M_{Co} unaffected.

Consider then two candidate equilibrium contract offers such that $\mu_G = \mu_B = 1$. 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, since $\hat{\alpha}|c_G^{SI} = 1$ and $\hat{\alpha}|c_B^{SI} = 0$, 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:

$$x_G(pR_{G,M} - 1) + \mathcal{A}_G \geq 0, \tag{A.10}$$

$$x_G q R_{G,L} - \mathcal{A}_G + \theta\kappa \tilde{U}_{B,M_{Co}} \leq 0. \tag{A.11}$$

Condition (A.10) is M_{NCo}'s participation constraint, Condition (A.11) 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

$$R_{G,L} = \frac{A}{q} - \frac{\theta\kappa}{(1-\theta\kappa)q}(qR - 1). \tag{A.12}$$

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.10) can be rewritten as

$$U_L^{SI} \geq U_L^{SE}, \tag{A.13}$$

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

Equilibrium contracts. Given the results above, and, in particular, Condition (A.13), 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 signaling through the acceptance decision of the commonly owned syndicate members is preferred by the lead bank L to the signaling via the contract design that takes place 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 the comparison of the results in Proposition 2 and Proposition 3.

Proposition 4. *Comparing the lending conditions ($1 + r$ and $\mathcal{A}$) with and without common ownership, we find the results in Proposition 1.*

Proof. For the first prediction,

$$r^* - r^{**} \quad = \quad R - \frac{A}{q} - \frac{1}{p} > 0 \tag{A.14}$$

$$\iff \quad A < \frac{q(pR-1)}{p} \tag{A.15}$$

follows from Assumption 1.

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

For the third prediction, we assume that there are many lead banks in the economy, each with funds A distributed according to some CDF $F(A)$. Then, only the lead banks with sufficiently large funds such that the bad firm will find mimicking unappealing will be able to obtain funding at the conditions of the separating equilibrium with asymmetric information.

□

Internet Appendix for:

"Credit Conditions when Lenders are Commonly Owned"

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.II: **Variable Definition**

Variable	Description
	Loan Variables
All-in-Drawn Spread	Facility all-in-drawn spread over the LIBOR rate
CO	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
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
# 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	$\frac{\frac{1}{N}\times\sum_j^N \text{Number of facilities between lead}_i \text{ and participant}_j \text{ in the past 3 years}}{\text{Number of facilities arranged by lead}_i \text{ in the past 3 years}}$
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
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	EBIT over total assets

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

	(1) All	(2) All	(3) All	(4) All	(5) No Top2	(6) TCB
CO	-26.647***		-22.226***	-42.004***	-40.265*	-10.236**
	(-4.008)		(-3.673)	(-3.609)	(-1.881)	(-2.088)
CO Quintile 2		-2.657				
		(-0.732)				
CO Quintile 3		-8.853**				
		(-2.151)				
CO Quintile 4		-10.584***				
		(-3.057)				
CO Quintile 5		-15.627***				
		(-3.762)				
Facility Amount	-14.894***	-15.100***	-15.160***	-20.792***	-11.525**	3.852
	(-4.099)	(-4.260)	(-4.487)	(-5.267)	(-2.167)	(1.098)
CO Member-Borrower	-11.256***	-10.927***	-17.430***	-10.999	-33.567**	-6.003***
	(-2.882)	(-2.785)	(-5.020)	(-1.035)	(-2.380)	(-2.821)
Log Maturity	0.665	0.633	-0.209	-3.009*	2.545	-20.717***
	(0.476)	(0.452)	(-0.134)	(-1.943)	(1.195)	(-12.075)
Secured Loan	17.026***	16.894***	18.258***	-6.801	23.940**	22.197***
	(4.818)	(4.772)	(5.716)	(-1.156)	(2.533)	(10.289)
Refinancing	-11.081***	-10.946***	-9.100***	-21.805***	-11.710*	-4.804***
	(-10.569)	(-10.360)	(-7.668)	(-9.261)	(-1.889)	(-4.755)
Log Number of Members	-20.747***	-20.855***	-17.333***	-20.569***	-20.883***	-14.137***
	(-11.795)	(-11.675)	(-11.134)	(-7.888)	(-3.644)	(-10.411)
Guarantor	-3.292*	-3.202*	-2.700*	-14.329**	-16.187**	-4.642**
	(-1.764)	(-1.751)	(-1.878)	(-2.501)	(-2.210)	(-2.426)
Relationship Score	-249.224***	-244.311***	-230.246***	-305.425***	-81.032	-62.202
	(-4.230)	(-4.244)	(-4.937)	(-3.298)	(-1.011)	(-1.554)
New Lending Relation	-0.348	-0.369	1.052	-4.665**	6.144	2.811***
	(-0.352)	(-0.356)	(1.342)	(-2.135)	(1.055)	(2.921)
LIBOR 3M	-229.214	-234.374	-740.952**	-1,478.401***	821.599	130.822
	(-0.419)	(-0.423)	(-2.183)	(-6.341)	(0.592)	(0.272)
Non-Bank Synd. Member	11.730***	11.843***	10.091***	6.140	24.638***	9.151***
	(4.316)	(4.349)	(4.752)	(0.998)	(4.062)	(5.029)
Prob. Default	34.378***	34.229***	36.397***	13.930	8.646	39.532***
	(3.313)	(3.347)	(3.623)	(0.925)	(0.293)	(6.715)
Stock Volatility	96.457***	96.167***	98.555***	165.150***	123.181***	61.670***
	(8.558)	(8.555)	(8.991)	(4.246)	(7.067)	(7.139)
Size	-6.885***	-7.013***	-4.246***		11.721	-1.009
	(-5.401)	(-5.489)	(-2.673)		(1.316)	(-0.918)
Profitability	-108.616***	-108.759***	-100.801***		-150.958	-69.932***
	(-5.926)	(-5.913)	(-6.208)		(-1.567)	(-6.647)
sd of profitability	18.533	19.133	-20.391		22.698	5.944
	(0.544)	(0.566)	(-0.679)		(0.188)	(0.312)
Book Leverage	44.236***	43.914***	41.308***		80.132**	37.490***
	(6.864)	(6.846)	(9.008)		(2.248)	(5.546)
Tangibilities	44.728***	43.691***	13.308		38.253	30.252**
	(3.358)	(3.342)	(1.268)		(0.997)	(2.425)
Tobin's Q	-6.462***	-6.519***	-6.113***		-6.801	-2.651**
	(-5.870)	(-6.025)	(-5.673)		(-1.485)	(-2.449)
Log Int. Cov.	-5.112***	-5.073***	-5.434***		6.256	-5.587***
	(-5.555)	(-5.584)	(-6.023)		(1.126)	(-6.700)
Liquidity Ratio	57.549***	56.767***	19.723**		40.593	41.782***
	(4.865)	(4.901)	(2.014)		(0.742)	(4.714)
Current Ratio	-1.077**	-1.049**	-0.877**		-3.135***	-0.210
	(-2.136)	(-2.117)	(-2.436)		(-4.119)	(-0.613)

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	(1) All	(2) All	(3) All	(4) All	(5) No Top2	(6) TCB
S&P Rating C	33.688	32.923	113.262***			-4.565
	(0.815)	(0.786)	(5.586)			(-0.169)
S&P Rating CC	32.422	32.245	-23.797			163.795***
	(1.566)	(1.543)	(-0.499)			(9.989)
S&P Rating CCC	49.991**	50.708**	9.298			25.924**
	(2.396)	(2.435)	(0.776)			(2.274)
S&P Rating B	-2.851	-2.764	5.740*		-45.588***	-2.002
	(-0.872)	(-0.855)	(1.854)		(-3.991)	(-0.632)
S&P Rating BB	-2.010	-1.964	-4.179*		-15.578	-11.314***
	(-0.859)	(-0.846)	(-1.677)		(-1.659)	(-9.014)
S&P Rating BBB	-23.987***	-24.117***	-28.214***		-11.727	-23.503***
	(-8.840)	(-8.924)	(-6.679)		(-0.923)	(-15.695)
S&P Rating A	-36.722***	-37.278***	-47.619***		-26.217*	-20.520***
	(-7.884)	(-7.925)	(-9.218)		(-1.783)	(-7.705)
S&P Rating AA	-21.881***	-22.456***	-31.902***		35.615	-12.847***
	(-4.346)	(-4.460)	(-4.203)		(1.151)	(-3.334)
S&P Rating AAA	-12.695	-13.255	-16.133**		207.071**	-11.512
	(-1.442)	(-1.516)	(-2.154)		(2.563)	(-1.649)
Lead Size Q2	-1.441	-0.945		-2.319	-8.556	0.151
	(-0.337)	(-0.222)		(-0.660)	(-0.954)	(0.043)
Lead Size Q3	-9.006	-8.109		-5.099	-27.960**	-6.124
	(-1.593)	(-1.434)		(-1.046)	(-2.506)	(-1.483)
Lead Size Q4	-8.644	-7.404		-7.492	-31.064**	-4.367
	(-1.479)	(-1.267)		(-1.378)	(-2.524)	(-0.983)
Lead Size Q5	-13.396**	-12.090*		-8.917	-56.066***	-6.265
	(-2.104)	(-1.917)		(-1.528)	(-4.681)	(-1.448)
Lead Market Equity	-0.766	-0.201		0.706	-29.853	-9.869
	(-0.029)	(-0.007)		(0.065)	(-0.723)	(-0.532)
Lead Book Leverage	7.811	8.017		2.164	45.700**	9.521
	(0.639)	(0.652)		(0.345)	(2.112)	(0.962)
Lead ROA	80.750	90.864		19.297	355.135	0.262
	(0.433)	(0.489)		(0.197)	(0.931)	(0.002)
Loan Purpose FE	Yes	Yes	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes	Yes	Yes
SIC2 FE	No	No	No	No	No	No
Year-Quarter FE	No	No	No	No	No	No
Lead FE	Yes	Yes	No	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	No	Yes	Yes
SIC2 X Year-Quarter FE	Yes	Yes	No	No	Yes	Yes
Lead X Year-Quarter FE	No	No	Yes	No	No	No
Borrower X Year FE	No	No	No	Yes	No	No
Observations	25,466	25,466	26,096	25,166	5,351	22,809
Adjusted R-squared	0.790	0.790	0.746	0.875	0.825	0.854

The table reports the OLS regression parameter estimates and t-statistics of Equation (5). The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). The specification also controls for facility-loan, lender, and borrower characteristics. Standard errors are clustered by lead bank. 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 using total-cost-of-borrowing (TCB) measure developed by Berg et al. (2016) as dependent variable. All variables are defined in Table B.II. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Table B.IV: **Common Ownership and Time-on-the-Market (TOM)**

	Spread (1) Invest. Grade	*Spread* (2) All with TOM	*Time-on-the-Market* (3) Leveraged
CO	-8.338**	-49.849**	-32.389**
	(-2.622)	(-2.329)	(-2.191)
Time-On-the-Market	-	0.007	
		(0.068)	
Loan Purpose FE	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes
Borrower FE	Yes	No	No
SIC2 X Year-Quarter FE	Yes	Yes	Yes
Observations	9,592	2,558	2,072
Adjusted R-squared	0.938	0.797	0.783

The table reports the OLS regression parameter estimates and t-statistics of Equation (5) in columns 1 and 2. In column 1, 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 column 2, the dependent variable is the all-in-drawn loan spread, expressed in basis points; the OLS regression is performed on the subsample of loans for which we have information on time-on-the-market, namely the number of days from the start to completion of syndication. The variable is also used as a control in the regression. In column 3, the dependent variable is time-on-the-market. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). Standard errors are heteroscedasticity-robust. All variables are defined in Table B.II. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Table B.V: **Facility Loan Spread and Common Ownership - Alternative definitions of common ownership**

	(1)	(2)	(3)	(4)
	Spread		Amount	
CO	-88.257***		-15.841***	
	(-3.667)		(-3.090)	
CO Quintile 2		-1.652		-2.386**
		(-0.490)		(-2.639)
CO Quintile 3		-8.180**		-4.682***
		(-2.542)		(-3.497)
CO Quintile 4		-10.396***		-3.833**
		(-2.902)		(-2.392)
CO Quintile 5		-10.729**		-4.349***
Loan Purpose FE	Yes	Yes	Yes	Yes
Facility Type FE	Yes	Yes	Yes	Yes
Lead FE	Yes	Yes	Yes	Yes
Borrower FE	Yes	Yes	No	No
SIC2 X Year-Quarter FE	Yes	Yes	Yes	Yes
Observations	25,467	25,467	8,090	8,090
Adjusted R-squared	0.790	0.790	0.743	0.744

The table reports the OLS regression parameter estimates and t-statistics of Equation (5). The dependent variable are: the all-in-drawn loan spread, expressed in basis points in column (1) and (2); and the percent of facility amount retained by the lead bank in column (3) and (4). The coefficient of interest is the one of CO, a measure of common ownership defined as the sum of the minimum commonly held shares by investors between the lead arranger and other syndicate members. 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% level, respectively.

Table B.VI: **Interest rates - Within-group estimates**

	(1)	(2)
	Same Facility Type - Same Loan	*Same Facility Type - Same Borrower-Year*
CO High	-13.715*	-10.079**
	(-1.824)	(-2.450)
Loan Purpose FE	Yes	Yes
Facility Type FE	Yes	Yes
Year-Quarter FE	Yes	Yes
Observations	229	1,740
Adjusted R-squared	0.964	0.596

The table reports the OLS regression parameter estimates and t-statistics of Equation (5) on a sample of loans containing facilities of the same type displaying high and low common ownership within a given loan. The dependent variable is the all-in-drawn loan spread, expressed in basis points. The coefficient of interest is the one of *CO High*, an indicator variable taking the value of one when common ownership between the lead and member banks in the same facility is high (quintile 4 and 5) and zero otherwise. All variables are defined in Table B.II. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

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

	(1) Full Sample	(2) Full Sample	(3) Not Term B Not Leveraged	(4) Not Term B Not Leveraged	(5) Selection 1st Stage	(6) Selection 2nd Stage
CO	-2.698***		-2.965*		-0.351**	-4.641**
	(-2.874)		(-1.897)		(-2.419)	(-2.134)
CO Quintile 2		-0.847		-2.340		
		(-1.215)		(-1.337)		
CO Quintile 3		-2.593***		-2.813**		
		(-2.723)		(-2.495)		
CO Quintile 4		-2.701***		-2.764**		
		(-3.124)		(-2.184)		
CO Quintile 5		-1.758*		-2.368*		
		(-1.986)		(-1.873)		
Facility Amount	0.256	0.258	3.657***	3.381***	-0.249**	2.732***
	(0.317)	(0.329)	(4.583)	(4.403)	(-2.136)	(2.911)
CO Member-Borrower	-0.805*	-0.682	0.777*	0.882**	0.106*	1.209**
	(-1.715)	(-1.414)	(1.908)	(2.089)	(1.790)	(2.343)
Log Maturity	0.433**	0.446**	-0.314	-0.322	-0.096***	-0.671**
	(2.050)	(2.091)	(-1.425)	(-1.409)	(-3.623)	(-2.563)
Secured Loan	1.182***	1.195***	-1.165**	-1.200**	-0.141**	-1.707***
	(3.569)	(3.552)	(-2.277)	(-2.442)	(-2.293)	(-2.740)
Refinancing	-0.276	-0.233	-0.061	0.046	0.347***	1.651*
	(-0.881)	(-0.722)	(-0.139)	(0.098)	(8.860)	(1.768)
Log Number of Members	-15.350***	-15.279***	-13.479***	-13.365***	0.822***	-9.916***
	(-14.676)	(-14.610)	(-8.808)	(-9.194)	(22.489)	(-5.834)
Guarantor	0.981***	0.884**	-0.266	-0.396	0.359***	1.194
	(2.848)	(2.580)	(-0.992)	(-1.237)	(7.281)	(1.432)
Relationship Score	8.931	8.588	-119.880***	-117.622***	-4.736***	-140.518***
	(1.138)	(1.135)	(-3.846)	(-3.857)	(-2.691)	(-3.945)
New Lending Relation	0.168	0.273	-0.166	-0.035	0.169***	0.491
	(0.630)	(1.032)	(-0.601)	(-0.122)	(5.150)	(1.662)
LIBOR 3M	-15.026	-16.078	-325.126***	-313.361**	0.285	-333.515***
	(-0.160)	(-0.165)	(-2.793)	(-2.694)	(0.290)	(-2.899)
Non-Bank Synd. Member	2.317***	2.335***	1.084	1.148	0.128***	1.447**
	(8.973)	(8.778)	(1.645)	(1.649)	(2.703)	(2.089)
Prob. Default	1.267	1.153	6.321**	6.525***	-0.420	5.961***
	(0.437)	(0.396)	(2.421)	(3.258)	(-1.427)	(2.760)
Stock Volatility	5.029***	4.849***	9.694**	9.593**	-0.208	8.124*
	(3.122)	(2.923)	(2.444)	(2.435)	(-1.283)	(1.918)
Size	0.381**	0.400***	0.697***	0.599**	-0.229***	-0.307
	(2.601)	(2.799)	(2.878)	(2.504)	(-11.818)	(-0.726)
Profitability	-1.517	-1.492	-1.002	-0.383	0.056	-0.892
	(-1.241)	(-1.219)	(-0.630)	(-0.249)	(0.375)	(-0.605)
sd of profitability	10.457***	10.539***	3.061	2.307	-0.976*	0.811
	(3.748)	(3.633)	(0.632)	(0.468)	(-1.692)	(0.147)
Book Leverage	0.737	0.934	1.265	1.037	0.050	1.385
	(0.324)	(0.403)	(0.408)	(0.327)	(0.322)	(0.435)
Tangibilities	-2.465**	-2.642**	2.003	1.531	0.204**	2.777**
	(-2.254)	(-2.420)	(1.596)	(1.152)	(2.519)	(2.050)
Tobin's Q	-0.480**	-0.497**	0.091	-0.004	-0.051**	-0.151
	(-2.210)	(-2.297)	(0.208)	(-0.008)	(-2.367)	(-0.306)
Log Int. Cov.	0.275	0.282	-0.027	-0.110	-0.014	-0.121
	(1.189)	(1.202)	(-0.089)	(-0.347)	(-0.468)	(-0.389)
Liquidity Ratio	-2.209	-1.947	2.774*	3.323*	0.158	4.225*
	(-0.696)	(-0.588)	(1.712)	(2.014)	(0.614)	(2.001)
Current Ratio	0.263*	0.275*	0.200	0.151	0.001	0.125

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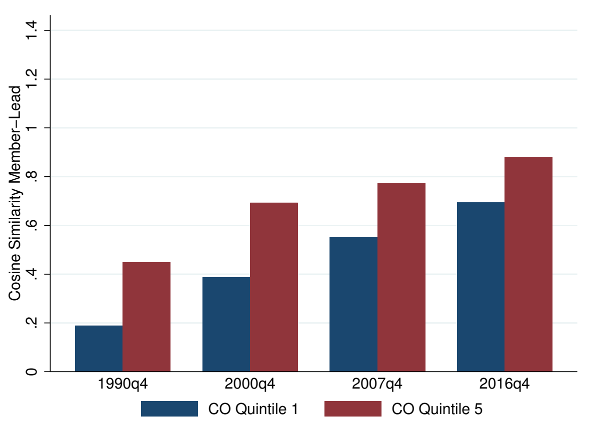
Table B.VII: **Facility amount retained by the lead bank - full results and robustness checks**

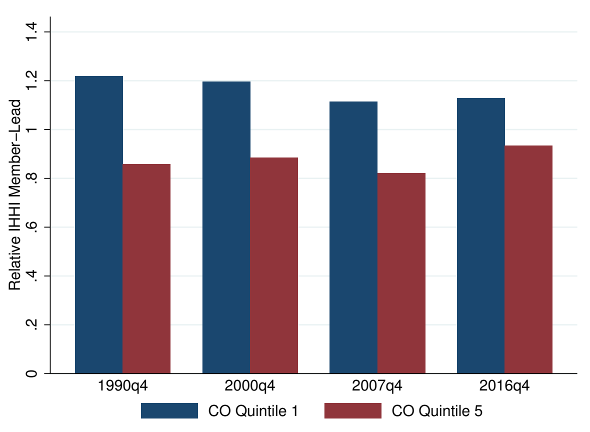
	(1) Full Sample	(2) Full Sample	(3) Not Term B Not Leveraged	(4) Not Term B Not Leveraged	(5) Selection 1st Stage	(6) Selection 2nd Stage
	(1.773)	(1.850)	(0.974)	(0.602)	(0.052)	(0.616)
S&P Rating C			-	-	-	-
S&P Rating CC			-	-	-	-
S&P Rating CCC	-5.791*	-6.002*	-	-	-	-
	(-1.769)	(-1.896)				
S&P Rating B	-1.676***	-1.604***	-12.250***	-12.571***	-0.370**	-14.206***
	(-3.736)	(-3.474)	(-5.006)	(-4.761)	(-2.023)	(-4.483)
S&P Rating BB	-0.931	-1.000*	-0.164	-0.372	-0.150*	-1.098
	(-1.609)	(-1.715)	(-0.135)	(-0.306)	(-1.679)	(-0.798)
S&P Rating BBB	-0.898**	-1.080***	-1.005	-1.244	-0.001	-1.149
	(-2.352)	(-2.777)	(-0.841)	(-1.021)	(-0.013)	(-0.977)
S&P Rating A	-0.140	-0.438	-0.708	-0.917	0.163**	-0.039
	(-0.195)	(-0.582)	(-0.723)	(-1.015)	(2.021)	(-0.046)
S&P Rating AA	0.174	-0.011	-0.293	-0.227	-0.024	-0.600
	(0.242)	(-0.015)	(-0.230)	(-0.194)	(-0.206)	(-0.420)
S&P Rating AAA	1.707	1.364			-0.154	0.608
	(1.398)	(1.231)			(-0.892)	(0.458)
Lead Size Q2	-0.776	-0.804	-4.550***	-4.825***	-0.104	-5.657***
	(-0.930)	(-0.954)	(-4.300)	(-4.430)	(-1.587)	(-5.629)
Lead Size Q3	-1.004	-0.972	-5.098***	-5.324***	-0.114	-6.368***
	(-1.014)	(-0.983)	(-5.765)	(-5.408)	(-1.564)	(-6.433)
Lead Size Q4	-0.488	-0.673	-5.861***	-6.129***	0.041	-6.437***
	(-0.491)	(-0.639)	(-5.086)	(-4.802)	(0.528)	(-5.339)
Lead Size Q5	0.013	-0.216	-5.962***	-6.228***	0.078	-6.362***
	(0.012)	(-0.193)	(-5.234)	(-4.968)	(0.968)	(-5.508)
Lead Market Equity	-2.704	-1.973	-3.504	-2.113	-0.245	-4.602
	(-0.704)	(-0.524)	(-0.745)	(-0.516)	(-0.528)	(-0.978)
Lead Book Leverage	-1.381	-2.154	5.563*	5.112*	0.351	7.168**
	(-0.471)	(-0.769)	(1.936)	(1.961)	(1.554)	(2.460)
Lead ROA	-36.055	-31.431	56.305*	49.322*	-6.140	20.211
	(-0.945)	(-0.841)	(2.022)	(1.847)	(-1.171)	(0.677)
Perc. Missing Facilities					-1.115***	
					(-6.855)	
Mills Ratio						6.560**
						(2.137)
Loan Purpose FE	Yes	Yes	Yes	Yes		Yes
Facility Type FE	Yes	Yes	Yes	Yes		Yes
SIC2 X Year-Quarter FE	Yes	Yes	Yes	Yes		Yes
Lead FE	Yes	Yes	Yes	Yes		Yes
Observations	8,110	8,110	2,753	2,753	7,489	2,746
Adjusted R-squared	0.743	0.744	0.805	0.806		0.804

The table reports the OLS regression parameter estimates and t-statistics of Equation (6). The dependent variable is the percentage facility amount retained by each lead bank in the syndicate. The coefficient of interest is the one of CO, a measure of common ownership between the lead and member banks in the same facility given in Equation (2). The specification also controls for facility-loan, lender, and borrower characteristics. Standard errors are clustered by lead bank. Columns (1)-(2) report the main results with the full set of controls. Columns (3)-(4) exclude all Term-Loan B and Leveraged facilities. Columns (5)-(6) report the results of the selection model. All variables are defined in Table B.II. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Figure B.1: **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 3.