Banks' Competitor-Specific Knowledge in Loan Markets

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Abstract

This study examines the effect of banks' competitor-specific knowledge, whether a bank has lent money to a firm's product-market competitors (i.e., rivals), on the matching of firms to lenders. We find an increased propensity of firms pairing up with a bank that has also lent to firms' rivals. The relation between lending to rivals is accentuated for firms with high levels of financial reporting opacity and attenuated for firms with high proprietary costs. These cross-sectional results are consistent with the benefits of information efficiencies being greater when financial reporting opacity is higher and the costs to firms being higher when firms have greater potential proprietary information. We also examine the economic consequences of our main findings through the pricing of bank loans. Consistent with lenders being able to leverage their inside knowledge of firms within the same product market and transfer the information efficiencies to borrowers, we document a reduction in the spread over LIBOR when firms borrow from banks that have also lent to their rivals in the past five years. We further find that this reduction in interest rate to be more pronounced when the borrowers' financial reporting quality is lower.

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1. Introduction

While a large literature exists on how loan characteristics are determined by the characteristics of the borrowing firm, whether borrowing firms' external relationship with other stakeholders, for example, competitors, customers, or suppliers, also affects loan characteristics is largely unexplored. Addressing this gap in the literature, this study investigates the effect of banks' competitor-specific knowledge, measured as whether a bank has lent money to a firm's product-market competitors (i.e., "rivals"), on borrower-lender matchups in the loan market. We then examine the economic consequences of these relations via the pricing of loans.

There are potential benefits and costs to banks and firms when rival firms borrow from a common bank. From a bank's perspective, a potential benefit is that lenders who provide debt financing to multiple competitors in the same product market are able to develop expertise in better evaluating firms in that particular market. As a result of this product-market expertise, information acquisition and processing costs by lenders could decrease for several reasons. For example, through banks' continuous due diligence in monitoring borrowers and banks' access to borrowers' private information, banks that have already lent to a firm's rival may be familiar with the firm's product-market dynamics, detailed product and market profitability, order backlog, product development status, and long-term technology trends. This knowledge acquired by lending to a rival could help banks interpret borrowers' disclosure and financial reports, and also help assess the risks of lending to a firm by comparing its prospects with that of its rivals. In turn, those banks may be able to create information efficiencies by reducing information acquisition and processing costs, and thereby offer loans at a lower rate. A potential cost of this type of lending, however, is less diversification in their portfolio of loans.

From a firm's perspective, in addition to a pricing advantage resulting from the transfer of information efficiencies for borrowers, a firm may also benefit directly in the form of reduced management time in preparing and communicating information with banks when dealing with knowledgeable lenders. A potential cost, however, of firms borrowing from the same lender as a rival is the possibility that banks pass on proprietary information obtained during the lending relationship to rivals. Information could be leaked explicitly, implicitly, or accidentally, during an information exchange between the bank and a rival. Prior research has documented information leakage by lenders in other, related settings (Acharya and Johnson, 2007; Massa and Rehman, 2008). In particular, Ivashina, Nair, Sauders, Massoud, and Stover (2005) find that lenders may leak private information to potential acquirers that borrow from the same banks. Anecdotally, the auto-parts maker Dana Corp filed a lawsuit in 2003 against a former lender, UBS, claiming that UBS used confidential information to help its rival ArvinMeritor Inc. to launch a $2.2 billion unsolicited bid for Dana Corp. Of course, proprietary information could also flow in the opposite direction. For example, proprietary information about a rival may also be leaked to the firm. In this case, borrowing from a bank that lends to a rival could benefit the firm.

Based on the arguments presented above, we predict that whether a bank has previously lent to the firm's product-market rivals will affect a firm's decision to form a lending relationship with the bank. Cross-sectionally, a bank should be more willing to establish banking relationship with multiple rivals when the information synergies are greater. We thus hypothesize that borrowing firms are more likely to match up with a bank that lends to its rivals if the financial reporting opacity of the borrower is greater. With lower quality financial information, a bank could place more weight on information from other sources. Specifically,

when borrowers have less transparent financial reporting, knowledge acquired by lending to a rival becomes particularly useful in helping banks interpret borrowers' private disclosures as well as their public financial reports. In this situation, the information-synergy benefits to a bank from product-market expertise gained from lending to rivals are higher. We further hypothesize that firms with more proprietary information are less likely to match up with a bank that lends to its rivals because these firms will be particularly concerned about potential leakage of private information.

Using a sample of 8,261 unique loans initiated between 1993 and 2008, we present evidence consistent with our expectations. We find an increased propensity of firm-bank matching when the bank has previously lent to the firm's product-market competitors as identified by the borrowers in their SEC filings. From the banks' perspective, this result is consistent with the benefits of information synergies outweighing the potential costs of a less-diversified loan base. From the borrowers' perspective, this result is consistent with firms' concerns of leaking proprietary information being less important than the cost advantage of using the same banks.

We further find that the propensity of firms to match with banks that have previously lent to the firm's product-market competitors becomes more positive when firms' financial accounting information is more opaque, measured as the first principal component of three accrual quality measures following the approach in Bharath, Sunder, and Sunder, 2008. This finding is consistent with the notion that the benefit of information synergy of sharing banks with rivals increases with borrowers' financial reporting opacity and that banks' private or other information about rivals substitutes for firms' public reporting information, rather than complementing each other. In addition, this propensity decreases with proprietary costs,

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measured as research and development expenditures and level of intangibility, suggesting that the potential leakage of proprietary information is a concern when choosing banks although it is not the most important factor for most firms.

We also examine the loan pricing implications of rival firms sharing a common lender. Using a sample of 1,023 bank loans, we examine whether the spread over LIBOR for loans depends on whether banks have lent to rivals in the past. If the bank lending to rivals has more information synergies, such as reduced lender information acquisition and processing costs, then some of these economic benefits could be shared with firms by lowering the interest charged on the loans. This represents a benefit that could offset the concern about the leaking of proprietary information. We document that the cost of borrowing is lower when firms borrow from a bank that has lent to their rivals, particularly for firms with high financial reporting opacity, suggesting that the information synergy is greater when borrowers have a lower reporting quality. In additional analyses, we further examine the dynamics of the pricing of loans to document when the cost savings are more likely passed along to borrowers. We document that the cost savings generated from banks' lending to multiple product-market rivals are more likely to be passed on to borrowers with relatively higher bargaining power.

The findings of this study are potentially of interest for several reasons. First, we add to the scant literature on how providers of loan financing are matched up with borrowers. To the best of our knowledge, this literature has focused exclusively on banks' expertise in processing firms' hard versus soft (i.e., easy to verify versus more difficult to verify) information. Prior research has shown that small banks have a comparative advantage over large ones in lending to small firms where processing of soft information is more needed while large banks tend to lend to large firms where information can be costlessly "hardened" and passed along (Stein, 2002;

Berger, Miller, Petersen, Rajan, and Stein, 2005; Agarwal and Hauswald, 2012). Our study extends these studies in that we examine how banks' information about rivals affects the matching of lenders with borrowers and whether this information interplays with firms' information environment, as opposed to the sole focus on borrower's information environment *per se*.

Second, our study is related to Asker and Ljungqvist (2010) who find that firms rarely share investment banks with product-market competitors because of concerns that proprietary information will be leaked to their competitors despite the informational benefits of sharing the same investment bank. Their results contrast with ours because we document that firms are both more likely to share a lender with rivals and benefit from lower pricing. In our setting, banks serve continuous monitoring roles throughout the life of the loan, likely causing the repetitive informational benefits of borrowing from the same lenders to outweigh the information leakage concerns. In contrast, investment banks have no obligation to monitor or exchange information with issuing firms after the financing event, and therefore, the one-time informational advantage of information sharing is more limited in their setting.

Third, we contribute to the literature on the capital market effects of product-market competition. Valta (2012) documents that the cost of bank debt is systematically higher for firms that operate in more competitive product markets due to the increased risk of reduced cash flows that arise from greater competitive rivalry. Our paper differs from Valta (2012) in that we focus on the interaction between product-market competitors and lender-borrower pairing and its effect on the cost of debt.[1] Furthermore, while Valta (2012) demonstrates a negative aspect of competition, our results suggest a potential positive externality of having product-market

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[1] Nonetheless, in additional analyses, we show that our inferences are not affected by the inclusion of competitive intensity proxies as a control.

competitors due to information synergies experienced by banks, holding everything else constant. Our results are consistent with the notion proposed by De Franco, Kothari, and Verdi (2011), among others, that increased comparability provides positive benefits in terms of reduced information acquisition and processing costs by external stakeholders.

Last, we contribute to the literature on product-market competition by introducing a new measure that identifies rivals to the literature. Specifically, we identify and acquire a listing of competitor information as reported by a firm in their 10K filings. Prior studies have documented concerns with other measures of competition such as Compustat-based measures (Ali, Klasa, and Yeung, 2008) or industry-based measures (Bens, Berger, and Monahan 2011; Rauh and Sufi, 2012). Our measure may be useful in future research when examining the dynamics and implication of product-market competition. It also complements the firm-specific competition measure in Li, Lundholm, and Minnis (2012).[2]

The next section develops our hypotheses related to the matching of rival firms with lenders. Section 3 details the sample selection and describes the research design for our firm and lender matching tests. In Section 4 we discuss and estimate the economic consequences of rivals sharing a common lender through the examination of the pricing of these loans. Section 5 concludes.

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[2] Our study also relates to an emerging stream of research that examines peer firms. For example, a related study examines how the bankruptcies of firms affect their industry rivals' cost of debt financing and stock prices (i.e., Benmelech and Bergman, 2011). Further, peer firms are used by a wide variety of stakeholders. Examples include: financial analysts to support their valuation multiples, earnings forecasts, and overall stock recommendations (e.g., Bradshaw, Miller, and Serafeim 2010); investors to judge the merits and comparability of investments (e.g., De Franco, Kothari, and Verdi 2011); fund managers in structuring their investment portfolios (e.g., Chan, Lakonishok, and Swaminathan 2007); compensation committees in setting executive compensation (e.g., Albuquerque 2009; Albuquerque, De Franco, and Verdi 2012); management in making capital expenditure decisions (e.g., Beatty, Liao, and Yu 2011) in determining valuation multiples (e.g., Bhojraj and Lee 2002); auditors in applying analytical procedures (e.g., Hoitash, Kogan, and Vasarhelyi 2006; Minutti-Meza 2011); and, researchers in choosing estimation samples to detect earnings management (e.g., Ecker, Francis, Olsson, and Schipper 2011).

2.   Related Literature and Hypotheses Development

During the lending process banks can obtain various types of information from borrowers to assess their creditworthiness. This information includes both public information that is widely available (e.g., public filings such as the annual 10-K filing), and private information that is covered by a confidentiality undertaking or subject to a bank's duty of confidence to a borrower (Spiro, 2007). According to the Loan Syndications and Trading Association (LSTA), in addition to periodic financial statements, lenders generally require private information from a borrower prior to making the initial lending decision and then also require periodic reporting of public and private information once a loan has been made. In addition, borrowers may need to report material information or news in a timely manner. Access to borrowers' private information is one of the largest advantages of bank debt financing compared to public debt markets. Banks can use this access to private information to mitigate information asymmetry at the initiation of the loan and to assist the monitoring of borrowers after loan initiations (Sufi, 2007; Beatty, Liao, and Weber, 2010; Hauswald and Marquez, 2006; Xie, Yan, and Yu, 2011).

The standards for the separation of public and private information, however, are largely discretionary (Ivashina and Sun, 2011), thereby giving rise to the possibility of banks leaking important private information. For example, it was not until October 2006 that the LSTA drafted and circulated among its members a set of principles designed to help loan-market participants handle confidential information. Ivashina and Sun (2011) argue that despite LSTA's efforts to eliminate the confusion between public versus private information, the debate of what constitutes private information remains in practices. Potential confusion of what constitutes private information that is subject to confidentiality requirements and public information that is not subject to those requirements increases the likelihood of banks leaking private information.

We argue that an alternative channel to help assess debtors' credit risk is via the lending relationship with their rivals. There are at least two possible avenues through which a bank can leverage their experience in lending to multiple rival firms, thereby better evaluating firms in that particular industry. First, by lending to multiple firms that operate within the same product market, a bank is able to develop expertise in interpreting public information for firms operating in that market. For example, a bank that has already lent to a firm's rival may be familiar with the firm's product-market dynamics, detailed product and market profitability, and long-term technology trends that help them interpret borrowers' financial reports.

Second, banks can directly use private information obtained about a rival to better evaluate the prospects of the firm requesting financing. For example, if a bank knows that a rival is expecting an increase in demand for their products, this information could also indicate an increase (or potentially a decrease) in demand for the borrower's products. A rival's information, such as order backlog, product development status (e.g., Xie, Yan, and Yu, 2011), could also be informative in evaluating the success (and eventual repayment prospects) of a firm. In addition, the information acquired by lending to multiple rivals can serve as confirmatory evidence regarding a bank's prior knowledge about the product market. This private knowledge could also make the bank more confident that it has appropriately assessed the risks of lending to a firm in that market.[3] This channel of using rivals' information to assess a potential debtor is consistent with Standard and Poor's (S&P) statement that they compare issuers with their peers, qualitatively and quantitatively, in determining credit ratings (S&P, 2012). To the extent that the

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[3] In a similar spirit to our argument and in a debt market context, Greenbaum, Kanatas, and Venezia (1989) analytically show that lenders with a preexisting relationship with a potential debtor have an informational advantage over other potential lenders. This relationship and related informational advantage results in a lower interest rate, which implies that the lender will more likely be chosen by the firm. The only difference between their model and our argument is that their source of information is the firm itself while our source is a firm's rivals.

benefits from the reduction in banks' information acquisition and processing costs through either channel can be passed on to the borrowers, borrowers have an incentive to share banks with their rivals.[4]

In addition to potential savings that the bank could pass on to the firm in the form of reduced interest costs, sharing a lender with a rival could also benefit borrowing firms through other mechanisms. If banks are more knowledgeable about the product market within which their clients operate, the banks could streamline the lending process for those firms by requiring less background information and follow-up communication from borrowing firms. This streamlining could lead to reduced time and costs spent on borrowing-related activities by the firm's management.

There are also reasons why firms may be less likely to borrow from a bank that has lent to the firm's product-market competitors. From the bank's point of view, a potential cost of lending to multiple firms within the same industry is the creation of a potentially less-diversified portfolio of loans. A common negative shock among rivals could cause the bank to bear accentuated downside risk when holding a less-diversified portfolio. This argument is consistent with Hertzel and Officer (2011) who find that loan spreads are significantly higher on new and renegotiated loans within an industry surrounding peer bankruptcy filings. To the extent that there is the potential for contagion within a product market, banks may be exposed to heightened credit risk through a less diversified portfolio of loans, and hence banks will be less likely to lend to multiple product market rivals. Alternatively, banks could attempt to price protect themselves

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[4] The notion of reduced information cost translating into lower borrowing cost is consistent with Bharath, Dahiya, Saunders, and Srinivasan (2011) who document that repeated borrowing from the same lender results into lower spreads on loans. We extend the notion and examine whether this improved information processing can also benefit rival firms within the same product market.

when offering lending terms to multiple rival firms within a product market and charge a greater interest rate, thereby discouraging direct competitors from borrowing from the same bank.

From the firm's point of view there are several reasons why it would not be beneficial to borrow from a bank that lends to the firm's product-market competitors. When borrowing from these banks, firms could experience additional costs in the form of banks passing proprietary information obtained during the lending relationship to rivals, whether explicitly, implicitly, or accidentally. The potential for information leakage is heightened particularly given, as discussed above, banks' confusion of the separation between private and public information as suggested by Ivashina and Sun (2011).

Prior research has documented information leakage by lenders in other, relevant settings. For example, consistent with institutional lenders benefiting from private information obtained during the lending process, Acharya and Johnson (2007) document evidence consistent with insider trading of clients' securities by banks in the credit default swap market. Massa and Rehman (2008) show that mutual funds increase their holdings in the firms that borrow from affiliated banks due to information obtained within the financial conglomerate. Further, Ivashina and Sun (2011) find that institutional lenders trade on private information acquired in the lending process. Finally, the findings of Asker and Ljungqvist (2010) show that concerns about leaking proprietary information is the likely explanation for why firms who engage in product-market competition avoid sharing investment banks with firms in their industry. They also find that this lack of sharing investment banks leads to higher prices for investment banking services. Based on the above discussions, our first hypothesis is as follows:

> *H1: The propensity of a firm pairing up with a bank is associated with whether the bank lends to the firm's product-market competitors.*

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We also expect the relation between product-market competition and borrower-lender pairing to vary cross-sectionally with firms' financial reporting quality. The potential benefits to a bank of lending to a rival are likely greatest when the potential information synergies to lenders are greater. Because banks rely primarily on periodic financial accounting reports and disclosure, along with private information, to assess the creditworthiness (Spiro, 2007), if a firm's financial reporting is more opaque, then the demand for private information and other supplemental and complementary information that help interpret financial statements will be greater. Hence, banks that lend to rivals will experience the greatest informational synergies from lending to a rival when a firm's financial accounting information is of lower quality. The preceding leads to our second hypothesis:

> *H2: The propensity of a firm pairing up with a bank who lends to the firm's product-market competitors is greater for firms with more opaque financial reporting.*

As discussed above, prior studies document evidence that banks may leak private proprietary information to competitors (Ivanshina, Nair, Sauders, Massoud, and Stover, 2005), that firms avoid the sharing of investment banks with their product-market competitors (Asker and Ljungqvist, 2010), and that banks use information obtained through lending relationships to trade in the credit default swap market (Acharya and Johnson, 2007) and stock market (Ivashina and Sun, 2011). Therefore, a concern regarding the potential leakage of proprietary information obtained during the lending relationship to rivals either explicitly, implicitly, or accidentally could lead to a reduced propensity to borrow from a bank who has also lent to a rival. These arguments lead to our third hypothesis:

> *H3: The propensity of a firm pairing up with a bank who lends to the firm's product-market competitors is lower when a firm has more proprietary information.*

3.   Empirical Analysis – Matching of Firms with Lenders

3.1.   Sample

We obtain our primary sample using data from multiple sources. First, we compile private bank loan information from the DealScan database, for bank loans included in the database that originated between 1993 and 2008. We only include the first loans arranged by each lead bank to rule out possible confounding effects due to the repetitive nature of lender-borrower relationships in the loan market. Next, we identify and acquire the borrower's competitor information from the Capital IQ database, where competitors are self-identified by firms in their 10-K filings. The intersection of these two databases generates 1,098 firms with competitor information. Finally, we compile firm characteristics for control variables and our measures for the cross-sectional tests from COMPUSTAT. After requiring non-missing data for the necessary firm characteristics, our final sample consists of 8,261 firm-bank combinations representing 843 firms in the analysis of firm and bank matching.

We believe our use of firms' self-reported set of competitors is desirable in our setting because we are interested in the borrowing behavior of firms as a result of the dynamics of rivalry. Further, it is likely that managers are most cognizant of their competitors. We note that this self-reported measure is potentially subject to managerial bias. In an attempt to validate our measure, we calculate the correlations of earnings and returns between firms and their self-reported rivals. We find that firms and their rivals are reasonably correlated in both earnings and returns with a correlation of 0.20 and 0.42, respectively. As a benchmark we also calculate the correlations of earnings and returns of firms within another commonly used measure of product-market competitors, two-digit SIC codes. Both earnings and returns are positively correlated among firms within the same two-digit SIC codes with spearman correlations of 0.06 and 0.26,

respectively. The relatively high earnings and returns correlations among rivals for our sample firms provide some comfort that our measure is valid.[5]

3.2. Research Design

3.2.1. Rivals and Matching of Firms with Lenders

To investigate whether rivals' borrowing behavior affects the matching of a firm to a lender, we run the following probit estimation:

$$LEND_{ij} = \beta_0 + \beta_1 LEND\_COMP + \beta_2 S\_SIZE + \beta_3 S\_MTB + \beta_4 S\_LEV + \beta_5 S\_EARN$$
$$+ \beta_6 SIZE + \beta_7 BANK\_EXP + \beta_8 COMOVE + \varepsilon \qquad (1)$$

$LEND_{ij}$ is an indicator variable that equals one if the bank loan that firm i takes on is arranged by bank j, zero otherwise. We construct this variable at inception of each bank loan, and for each firm we compile a group of J banks, only one of which is equal to one. Alternatively stated, we assume that when choosing a bank to borrow from, firm i has J bank choices and picks one bank from the J choices as the lead bank arranging the bank loan. To limit the possibly enormous firm-bank relationship matrix when forming the $LEND_{ij}$ relationships, we only identify banks as possible lenders if they are highly visible and have more experience in the firm's industry. Specifically, we identify the eight banks that have the greatest market share during the sample period within the same two-digit SIC code as the borrowing firm to construct possible firm-lender pairing combinations.[6]

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[5] One important drawback of using firms' self-identified competitor disclosures as our competitor proxy is that this voluntary disclosure starts from 2007. To ensure that this database is appropriate for our analysis and can be used retroactively, we randomly checked firms' disclosure. We found that firms' disclosures are very consistent from 2007 to 2011; that is, competitors identified by firms stay constant, which is consistent with Li, Lundholm, and Minnis (2012) argument that competition is constant through time. Second, we reran the analysis using a sample period that is closer to the enactment of this disclosure from 2004. We continue to find similar results. Finally, we use an alternative proxy for competitors based on De Franco et al.'s (2011) comparability measure. We continue to find similar results. More details are discussed in the robustness section.

[6] Results and inferences are similar when using either the top five or top ten banks in a certain industry to form the possible combinations. We also perform our analyses using a random sample of banks and observe results that are qualitatively and quantitatively similar.

The test variable of interest in the probit model is *LEND_COMP,* an indicator variable set equal to one if any rival of the firm that has been identified in the 10-K filings, has borrowed from bank *j* in the past five years, zero otherwise. We include a battery of control variables in our model.[7] These controls are designed to help ensure that we are not simply capturing the similarity in firm characteristics between firm *i* and other firms that borrow from bank *j*. That is, we control for the possibility that bank *j* lends to both firm *i* and other firms operating in their product market primarily because of the similarity of the firm characteristics but not rivalry *per se*. We construct several variables to capture this similarity. The first such control we include is a measure of the similarity of firm size between firm *i* and bank *j*'s other borrowers. Specifically, *S_SIZE* is measured as negative one multiplied by the absolute value of the difference between firm *i*'s *SIZE* and the median *SIZE* of the firms bank *j* lent to within the five years before firm *i*'s decision to take on new bank debt. *SIZE* is measured as the natural log of total assets of firm *i* (COMPUSTAT data item "at"). Based on prior research (e.g., Berger, Miller, Petersen, Rajan, and Stein, 2005), we expect the coefficient on *S_SIZE* to be positive because large (small) banks tend to lend to large (small) firms.

Other similarity control variables are defined in an analogous manner. We include a control for the similarity of firms' market-to-book ratio by including *S_MTB*, where *MTB* is measured as the ratio of market value of the firm, proxied by the market value of equity plus the book value of debt, to the book value of the firm (COMPUSTAT data items ["prcc_f"* "csho" + "at" – "ceq"]/ "at"). We also control for the similarity of firms' leverage by including *S_LEV*, where *LEV* is measured as the ratio of firm *i*'s total debt to total assets (COMPUSTAT data

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[7] We are not aware of any previous studies that examine the choice of a specific lender. We select control variables designed to capture other factors that may influence lender choice. The selection is partly based on prior research that has examined the choice of a type of lender. For example Denis and Mihov (2003) examine the determinants of borrowing in public markets versus bank loans versus private non-bank loans.

items "dlc" + "dltt" divided by "at"). Lastly, we control for similarity in earnings measured as *S_EARN*, where *EARN* is measured as firm *i*'s income before extraordinary items scaled by total assets (COMPUSTAT data items "ib" divided by lagged "at").

In addition to the similarity control variables, we also control for firm size (*SIZE*), bank expertise (*BANK_EXP*), and the comovement of earnings between firm *i* and bank *j*'s portfolio of loans (*COMOVE*) to capture the effect of diversification on lending relationships. We define *SIZE* as discussed above. *BANK_EXP* is defined as the natural log of bank *j*'s total lending to firms in the same two-digit SIC as firm *i* within the sample period. *COMOVE* is defined as the correlation of the change in firm *i*'s earnings (COMPUSTAT data item "ib") over the past five years with the change in earnings of the other firms in the bank *j*'s portfolio of loans. We expect a positive coefficient on *BANK_EXP* because large banks are able to lend to more firms and a negative coefficient on *COMOVE* because banks are more likely to lend to a firm whose performance is less closely aligned with other firms in the bank's portfolio in order to diversify. We do not have a prediction on *SIZE*. Detailed variable definitions are presented in Appendix A.

3.2.2. Matching of Firms with Banks: Financial Reporting Opacity and Proprietary Costs

We test the cross-sectional predictions from hypothesis 2 and hypothesis 3 using the following probit model. This model is based on Equation (1) but we introduce main effects and interaction terms (interacted with *LEND_COMP*) for proxies of financial reporting opacity and proprietary information.

$$
\begin{aligned}
LEND_{ij} = {} & \beta_0 + \beta_1\, LEND\_COMP + \beta_2\, OPAQ\_D + \beta_3\, OPAQ\_D{\times}LEND\_COMP \\
& + \beta_4\, PC\_D + \beta_5\, PC\_D{\times}LEND\_COMP + \beta_6\, S\_SIZE + \beta_7\, S\_MTB + \beta_8\, S\_LEV \\
& + \beta_9\, S\_EARN + \beta_{10}\, SIZE + \beta_{11}\, BANK\_EXP + \beta_{12}\, COMOVE + \varepsilon \qquad (2)
\end{aligned}
$$

OPAQ_D is our proxy for financial reporting opacity. Following Bharath, Sunder, and Sunder (2008) and Beatty, Liao, and Weber (2010), we define *OPAQ_D* as an indicator variable that

equals one if the first principal component of absolute value of discretionary accruals estimated from three different accrual models is greater than the median of the sample, zero otherwise. The detailed estimation is provided in Appendix B. Following prior studies (e.g., Ellis, Fee, and Thomas, 2011; Jones, 2007), we use R&D expenditures as our first proxy for proprietary costs. We define *PC_D* as an indicator variable equal to one if the research and development (R&D) expenditures of firm *i* (measured as COMPUSTAT data item "xrd" divided by lagged total assets COMPUSTAT data item "at") are greater than the median in the sample, zero otherwise.

Based on hypothesis 2 we expect the β_3 coefficient on the interaction term *OPAQ_D×LEND_COMP* to be positive. This prediction is consistent with a greater propensity for firms to form a banking relationship with the same bank as their rivals when financial reporting opacity is higher. Based on hypothesis 3 we expect the β_5 coefficient on the interaction term *PC_D×LEND_COMP* to be negative. This prediction is consistent with a reduced propensity for firms to pair up with the same bank as their rivals when firms' proprietary costs are higher.

3.3. *Univariate Comparison*

We provide descriptive statistics of our main variables and control variables for our lender choice sample in Table 1. All continuous variables for this and all remaining analyses are winsorized at the top and bottom 1%. The observations are partitioned on whether firm *i* borrows from bank *j* (i.e., $LEND_{ij} = 1$ versus $LEND_{ij} = 0$). Consistent with hypothesis 1 that banks' lending relationships with rivals affect the matching of banks with borrowing firms, we find that firms are more likely to borrow from the same bank that has lent to their rivals in the past five years: *LEND_COMP* is 0.459 versus 0.310 for $LEND_{ij} = 1$ vs. $LEND_{ij} = 0$ respectively, with the difference being statistically significantly. We also find that, consistent with our expectations,

the characteristics (i.e., firm size, leverage ratio, and earnings) of the firm i are closer to the firms borrowing from the bank that lends to firm i than banks that do not lend to firm i. This finding is consistent with prior studies that find that firms with similar characteristics (i.e., size) tend to borrow from the same banks and underscores the importance of the control variables included in our multivariate analysis.

Table 2 presents the Pearson correlations among these variables. Again, consistent with our predictions, $LEND_{ij}$ and $LEND\_COMP$, S_SIZE, S_LEV, S_EARN and $BANK\_EXP$ are positively correlated. In addition, we do not find any pair of variables with a correlation greater than 0.42, suggesting that collinearity is not a serious issue in our regression analysis.

3.4.   Multivariate Tests

3.4.1. Rivals and Matching of Firms with Lenders

Table 3 presents the tests of hypothesis 1. In the first column, we observe a significant and positive coefficient on the variable of interest, $LEND\_COMP$. The observed coefficient is consistent with the notion that firms are more likely to borrow from a bank that has lent to their rivals in the past five years than from a bank who has not lent to their rivals. This finding suggests that the information synergies and related cost savings seem to dominate the borrowers' concerns for potential leakage of proprietary information and banks' diversification concern. This result is also economically significant. If one of firm i's rivals borrows from bank j, then the chance that firm i also borrows from bank j is 7.6% higher than if no rival uses bank j.[8]

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[8] An alternative interpretation of this finding is because banks have proprietary information about the operations of a firm's rivals, the willingness to lend to the firm may be an indication that the projects that the firm is taking on are likely to be successful based on the bank's evaluations. On the other hand, banks may not be willing to lend to firms that they think are less competitive compared to rivals based on the bank's superior information about the rivals. Note this alternative explanation for our findings is still consistent with our hypotheses. Private information about rivals leaked to the firm could be mutually beneficial to the firm and the bank (although potentially not the rival, we explore this issue in greater depth in our hypotheses and tests related to proprietary costs).

As for the control variables, we generally observe results that are consistent with our predictions. Firms are more likely to borrow from a bank that lends to other firms with similar firm size, leverage, and level of accounting earnings. In addition, firms are more likely to borrow from banks that have more expertise in the same two-digit SIC code industry. Finally, we find that when the firm's earnings tend to co-move with bank j's portfolios the firm is less likely to borrow from that bank.

3.4.2. *Matching of Firms with Banks: Financial Reporting Opacity and Proprietary Costs*

We investigate the cross-sectional variation in the propensity to borrow from the same bank as rivals operating in the same product market by estimating Model 2. These results, presented in column 2 of Table 3, provide evidence consistent with hypothesis 2. That is, the likelihood of using the same bank as rivals increases with the opacity of borrowers' financial reporting. This finding is suggestive of the notion that the more opaque the information environment, the more beneficial it is to borrow from a bank that has relatively more experience with firms in the related product market. This result also suggests that public financial information and other information such as product market knowledge acquired via lending to rivals seem to act as substitutes, rather than complements. This implication is consistent with banks using private and public accounting information as substitutes to monitor borrowers (Beatty et al., 2010). The relation between firms' financial reporting opacity and lender choice is also economically significant. The probability of borrowing from the same bank that has lent to a rival is 11.82% higher than from banks that have not lent to a rival for high financial reporting opacity firms.[9]

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[9] For high accounting quality and low R&D firms, the probability of borrowing from the same bank that has lent a rival is 7.32% higher than from other banks.

We also observe results consistent with the predicted cross-sectional variation from hypothesis 3 in column 2 of Table 3. That is, the likelihood of borrowing from the same bank as rivals decreases with R&D expenditures. This finding is suggestive of the notion that firms with higher levels of proprietary information are more likely to avoid borrowing from the same banks that lend to rivals operating within the same product market to reduce the possibility of information leakage to competitors. The relation between proprietary information and lender choice is also economically significant. The probability of borrowing from the same bank that has lent to a rival is only 3.54% higher than from other banks that have not lent to a rival for high R&D firms.

3.5.   *Additional Analysis*

In this section, we allow the effect of rivalry on firm-bank pairings to vary with the level of inter-firm competition by augmenting model 2 as follows:

$$
\begin{aligned}
LEND_{ij} = {} & \beta_0 + \beta_1\,LEND\_COMP + \beta_2\,COMPETITION + \beta_3\,LEND\_COMP{\times}COMPETITION \\
& + \beta_4\,OPAQ\_D + \beta_5\,OPAQ\_D{\times}LEND\_COMP \\
& + \beta_6\,OPAQ\_D{\times}LEND\_COMP{\times}COMPETITION + \beta_7\,PC\_D \\
& + \beta_8\,PC\_D{\times}LEND\_COMP + \beta_9\,PC\_D{\times}LEND\_COMP{\times}COMPETITION \\
& + \beta_{10}\,S\_SIZE + \beta_{11}\,S\_MTB + \beta_{12}\,S\_LEV + \beta_{13}\,S\_EARN + \beta_{14}\,SIZE + \beta_{15}\,BANK\_EXP \\
& + \beta_{16}\,COMOVE + \varepsilon
\end{aligned} \tag{3}
$$

We measure competition using the proxy developed by Li, Lundholm, and Minnis (2012). The measure of competition is based on management's disclosures and compiled using a count of the number of references to "competition" in the firm's 10-K filing scaled by the total number of words in the document, and then divided by firm size or number of segments. Specifically, our variable *COMPETITION* is measured as the average of two indicator variables: an indicator equal to one if the ratio of the word "competition" to other words in the 10-K scaled by the number of segments is greater than the sample median, zero otherwise; and an indicator equal to

one if the ratio of the word "competition" to other words in the 10-K scaled by firm size is greater than the mean, zero otherwise.[10] All other variables are defined as in models 1 and 2.

We expect that the effect of both financial reporting opacity and proprietary costs to be more pronounced when the level of competition is fiercer. When the product market is more competitive, avoiding the leakage of proprietary information would be more important for firms. Further, banks' information synergy via lending to multiple competitors would become more beneficial because more similarity in operations among rival firms should lead to greater information efficiencies.

Results from this specification are presented in Table 3 column 3 and are consistent with the above conjecture.[11] The likelihood of borrowing from the same bank as rivals increases for firms with high levels of inter-firm competition. Additionally, high levels of *COMPETITION* strengthen both the positive relation between financial reporting opacity and borrowing from the same lender as rivals and the negative relation between proprietary costs and borrowing from the same lender as rivals. These results further suggest that our findings above are indeed driven by rivalry, instead of other omitted variables.

3.6.   Robustness Checks

We perform a number of tests to substantiate the robustness of our main findings. First, to ensure our results are not driven by our choice of the empirical measure of rivalry, we repeat our analysis using an alternative proxy for rivalry. We use the firm comparability measure from De Franco, Kothari, and Verdi (2011). Untabulated results using this alternative proxy for rivalry are generally consistent with those presented using our self-reported competitors measure. All results

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[10] To avoid measurement error, we measure the competition proxies by averaging the ratio of the word "competition" scaled either by number of segments or firm size in the period 1999-2008.

[11] Note – We lose 1,482 observations from our initial sample we performing this test due to data availability of the *COMPETITION* measure.

are significant at the 5% level (one-tailed or two-tailed, as appropriate). A potential shortcoming of this alternative measure is that it may not cleanly capture rivalry, although it does provide us with more confidence in, and complements, the self-reported competitor measure used in our primary analysis.

Next, we use an alternative measure for proprietary costs. Following Ellis, Fee, and Thomas (2010), we use intangibility as a proxy where intangibility is defined as one minus the sum of current assets and property, plant, and equipment scaled by total assets. Both R&D and intangibility proxy for proprietary costs as both capture innovations by the firm and the property rights associated with innovations are not perfectly enforceable, leading to potential proprietary costs. Using this alternative measure we continue to observe similar results to those reported in the tables; firms with higher levels of intangibility are less likely to share the same banks as rivals (significant at the 5% level). We perform an additional related robustness test to ensure that our main finding that firms tend to borrow from the same banks as rivals is not driven by low R&D industries. We repeat our analysis on only firms in high R&D industries. Results from this subsample are consistent with those reported using the main broader sample, suggesting our findings are not driven by firms in low R&D industries.

It should be noted that 40% of rivals self-identified by firms in the Capital IQ database do not have the same two-digit SIC codes as the firm. However, because we use the eight largest banks lending to an industry (defined using two-digit SIC codes) to form the possible firm i-bank j combinations for the dependent variable, there is the possibility that we may draw biased inferences. To address this potential concern, we eliminate rivals with different two-digit SIC codes and repeat our analysis. This results in a reduced sample of 6,890 observations for our

supplemental tests. Using this subsample we continue to observe results qualitatively and quantitatively similar to those reported in Table 3.

Finally, prior research documents a negative association between the lender-borrower geographical distance and the propensity of a bank to lend to a firm (Guiso, Sapienza, and Zingales, 2004; Agarwal and Hauswald, 2010; Wang 2012). To ensure our findings are not driven by an underlying relation between rivalry and geographic distance, we include a control variable capturing the distance between the bank and the firm's head office. In untabulated tests we observe results that are quantitatively and qualitatively similar to those reported in the tables.

4. Economic Consequences – Loan Pricing

In this section we examine the loan pricing implications of rival firms borrowing from the same bank. Banks who are able to develop an expertise in a particular product market should be able to exploit this expertise, create efficiencies, and offer loans to their debtors at a lower rate than they would otherwise be able to. While our first hypothesis could still hold even if the cost savings experienced by banks are not passed onto borrowers, we expect banks to pass savings onto borrowers in the form of lower interest costs due to the competitive nature of the lending market.

In addition, if the information synergy to a bank who lends to rivals is greater when borrowers' financial reporting opacity is higher, then more cost savings may be transferred to these high opacity borrowers. Bharath, Dahiya, Saunders, and Srinivasan (2011) present findings consistent with the preceding conjecture. They document that the negative effect of a preexisting lending relationship on the cost of debt increases with information opacity. Further, because firms could also experience additional costs in the form of banks passing proprietary information obtained during due diligence work to rivals, borrowing firms could demand a greater reduction

in interest rates in order to share the same lenders with rivals. Consequently, we predict that the firms with high proprietary information that share the same banks as rivals will bear lower interest rates.

4.1. Sample and Research Design

To examine the pricing of loans we begin with the data compiled from DealScan, Capital IQ, and COMPUSTAT for the lender choice sample but only include loans that are actually taken by firm i from bank j due to the requirement of loan pricing data. As a result of the further data requirements on loan characteristics, our final sample for the loan pricing tests consists of 1,023 unique loans.

4.1.1. Rivals and Loan Pricing

To examine whether a firm's loan yields are lower when borrowing from a bank that also lends to the firm's rivals we estimate the following ordinary least squares equation:

$$
\begin{aligned}
Allindrawn_{ij} = {} & \beta_0 + \beta_1\, LEND\_COMP + \beta_2\, SIZE + \beta_3\, MTB + \beta_4\, LEV + \beta_5\, EARN \\
& + \beta_6\, Z\_RANK + \beta_7\, DEBT\_SIZE + \beta_8\, MATURITY + \beta_9\, SECURITY \\
& + \beta_{10}\, TAKEOVER + \varepsilon
\end{aligned} \tag{4}
$$

Allindrawn is the all-in-drawn interest charges over LIBOR for firm i, collected from the LPC database. The independent variable of interest is the indicator variable *LEND_COMP* (defined as discussed in section 3.2). We expect a negative β_1 coefficient on *LEND_COMP*, consistent with a decrease in the cost of borrowing for firms that borrow from a bank who lends to the firm's rivals as a result of shared cost savings by the bank.

We include a battery of control variables in our model based on prior studies (e.g., Bharath, Sunder, and Sunder, 2008; Beatty and Weber, 2003). First, we include firm size (*SIZE*), the market-to-book ratio (*MTB*), financial leverage (*LEV*), and accounting earnings (*EARN*) of firm i. We further include *Z_RANK* to capture the firm's distress risk, measured as the quintile

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rank of the firm's Altman (1968) Z-score.[12] Based on the prior studies, we expect larger firms, firms with higher MTB ratios, higher accounting earnings, lower leverage, and further from bankruptcy (i.e., lower values of *Z_RANK*) to incur a lower cost of debt.

In addition to firm specific characteristics, we also control for a number of loan specific characteristics. Namely, we control for the size of the loan (*DEBT_SIZE*), measured as the amount of the facility scaled by total assets. We control for the maturity (*MATURITY*) of the loan, measured as the natural log of the term of the loan in months. To control for whether or not the loan requires collateral, we set an indicator variable (*SECURITY*) equal to one if collateral is required, zero otherwise. Finally, we control for the purpose of the loan. Specifically, we control for whether the loan is expected to fund takeovers (*TAKEOVER*). We expect that loans with longer maturities, loans that require collateral, and loans funding takeovers to require higher interest rates. Detailed variable definitions are presented in Appendix A.

4.1.2. *Loan Pricing: Financial Reporting Opacity and Proprietary Costs*

We examine our cross-sectional predictions about the relations between loan pricing and financial reporting opacity and proprietary costs using the following ordinary least squares model. This model is based on Equation (4) but we introduce main effect and interaction terms (interacted with *LEND_COMP*) for proxies of financial reporting opacity and proprietary costs.

$$
\begin{aligned}
Allindrawn_{ij} = {} & \beta_0 + \beta_1\,LEND\_COMP + \beta_2\,OPAQ\_D + \beta_3\,OPAQ\_D{\times}LEND\_COMP \\
& + \beta_4\,PC\_D + \beta_5\,PC\_D{\times}LEND\_COMP + \beta_6\,SIZE + \beta_7\,MTB + \beta_8\,LEV \\
& + \beta_9\,EARN + \beta_{10}\,Z\_RANK + \beta_{11}\,DEBT\_SIZE + \beta_{12}\,MATURITY \\
& + \beta_{13}\,SECURITY + \beta_{14}\,TAKEOVER + \varepsilon
\end{aligned}
\tag{5}
$$

All variables are defined above. We expect the coefficient on the interaction term

---

[12] Z-score is compiled as 3.3 times COMPUSTAT data items "pi + xint" divided by COMPUSTAT data item "at" plus 1.2 times COMPUSTAT data items "act" – "lct" divided by COMPUSTAT data item "at" plus COMPUSTAT data item "revt" divided by COMPUSTAT data item "at" plus 1.4 times COMPUSTAT data item "re" divided by COMPUSTAT data item "at" plus .6 times the product of COMPUSTAT data items "chso" and "prcc_f" divided by COMPUSTAT data item "lt."

OPAQ_D×LEND_COMP to be negative, consistent with a greater reduction in borrowing costs for firms that borrow from the same bank as their rivals when their financial reporting opacity is high. We expect the coefficient on the interaction term *PC_D×LEND_COMP* to be negative based on the notion that firms with high proprietary costs will demand a greater price reduction to use the same banks as their rivals.

4.2. *Univariate Comparison*

We provide descriptive statistics of our main variables and control variables for our loan pricing sample in Table 4. As above, the observations are partitioned on whether the loan is originated from a bank that has also lent to the firm's rivals in the past five years. Consistent with banks passing on savings to borrowers when lending to rival firms, loan spreads over LIBOR, *Allindrawn*, are significantly lower for loans originated from a bank that has also lent to the firm's rivals in the past five years; that is, the mean (median) value of *Allindrawn* is 114.1 (87.5) compared to 127.1 (100.0) for *LEND_COMP* = 1 versus *LEND_COMP* = 0 observations respectively. Our proxies for financial reporting opacity and proprietary costs (*OPAQ_D* and *PC_D* respectively) are not significantly different between the two groups. Likewise, there is not a significant difference in firm size between the groups. Firms who borrow from a bank that has also lent to the firm's rivals in the past five years have significantly higher market-to-book ratios, are less levered, and have higher Z-scores than firms who do not share a lender with their rivals. Loan level variables are generally similar between the two groups although the *LEND_COMP* = 1 loans are more likely to be taken for takeover purposes. The similarity between the two groups gives us comfort that the observed differences in pricing are the result of loans being originated by a common lender to product-market rivals and not some other cause.

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4.3. *Multivariate Tests*

4.3.1. *Rivals and Loan Pricing*

Table 5 presents the main loan pricing tests. Results from estimating Model 4 are presented in column 1. We observe a significant and negative coefficient on the independent variable of interest, *LEND_COMP*. This result is consistent with a lower interest rate on loans taken by firms that borrow from a bank that has also lent to their rivals in the past five years than loans from a bank who has not lent to their rivals. This result is also economically significant as the coefficient on *LEND_COMP* can be interpreted as firms paying interest spreads that are 10.1 basis points lower when they borrow from the same bank that has also lent to their rivals. Alternatively stated, this represents an 8% difference when compared to the average spread over LIBOR of 120 basis points. The signs and significance of the coefficients on the control variables are generally consistent with our expectations and findings from prior research. Size, accounting earnings, Z-score ranking, and debt facility size are all significantly negatively associated with loan spreads. A positive and significant coefficient is observed on financial leverage, the requirement for collateral on the loan, and when a takeover is the loan purpose.

4.3.2. *Loan Pricing: Financial Reporting Opacity and Proprietary Costs*

We investigate our predicted cross-sectional variation in the pricing of loans for firms who borrow from the same bank as rivals by estimating Model 5. These results are presented in column 2 of Table 5 and are consistent with the expected relation between rivals, loan pricing and financial reporting opacity. That is, the reduction in the cost of borrowing for firms who borrow from the same bank as their rivals increases when the firms' financial reporting opacity is high. The economic magnitude is large: the marginal effect of borrowing from banks that lend to product market rivals is -25.9 basis points for high financial reporting opacity firms versus 6.2

basis points for low financial reporting opacity firms. This finding suggests that the more opaque the information environment, the more beneficial it is for the firm to borrow from a bank that has relatively more experience with firms in the related product market. We do not find any evidence of a relation between rivals, loan pricing and proprietary costs in column 2 of Table 5, suggesting that the proprietary information leakage concern does not affect loan pricing. As in column 1, the signs and significance of the coefficients on the control variables are generally consistent with our expectations and findings from prior research.

4.4. *Relative Bargaining Power*

Based on the findings presented in Section 4.3.1, lenders pass on some of the realized information efficiencies when lending to multiple rivals (through a reduction in interest spreads). As an additional analysis, we explore this benefit sharing further. We examine if the cost savings are passed on to a greater degree when firms have relatively high bargaining power. We repeat our analysis using equation (5) separately on the subsample of firms with relatively high versus low borrower bargaining power. We define bargaining power as the ratio of the amount of loan over the total amount of loans by bank *j* in the same two-digit SIC industry. We split the sample into high and low borrower bargaining power at the sample median.

Table 6 presents the results for this specification. We observe a negative and significant coefficient on *OPAQ_D*LEND_COMP* for the high borrower bargaining power group but not for the low borrower bargaining power group, suggesting that a portion of the cost savings are more likely to be transferred to borrowers when they have higher bargaining power. The difference between the two subsamples in the coefficients is significant just above the 5 percent level (p-value = 0.056). For the firms with relatively high (low) bargaining power, the observed coefficient for the high financial reporting opacity group of firms that share a lender with a

rival(s) represents a 44.6 (9.5) basis point reduction in borrowing costs compared to firms with low financial reporting opacity that also share banks with rivals.[13]

5.　　Conclusion

In this study we examine how providers of private loan financing are matched up with borrowers. Specifically, we examine the effect of banks' competitor-specific knowledge, whether a bank has lent money to a firm's rivals within their product market, on both the firm-bank pairings when borrowing in the loan market and the pricing of the loan. We document evidence consistent with an increased propensity to pair up with a bank who has also lent to a firm's rivals. Additionally, we document that firms are more likely to pair up with the same bank as their rivals when financial reporting opacity is high and when proprietary costs are low. We also document that the cost of borrowing is lower on loans to a firm that borrows from the same bank as rivals within their product market, consistent with banks transferring at least a portion of the cost savings achieved through efficiencies to borrowers. Further, the reduction in borrowing costs is greater for firms with common creditors to their rivals when financial reporting opacity is high. This result is concentrated in the subsample of firms with relatively high bargaining power.

The findings of this study are potentially of interest for several reasons. First, this study contributes to the literature on how lenders are matched up with borrowers. Our study extends this literature by examining how product-market competitors' lender choice, and lenders' information about the competitors, impacts the matching of banks with borrowers. We also

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[13] Similar to Section 3.6, we perform several robustness checks for our loan pricing tests. We first restrict the rivals included in the analysis to those with the same two-digit SIC codes as the firm. We also use intangibility as an alternative measure of proprietary information. Results and inferences under both specifications are similar to those reported above.

document that lenders' knowledge about rival firms appears to substitute for borrowers' public accounting information as an alternative information channel in debt contracting. Our study also extends the literature on the relationship between rivals and their financers. Prior research has documented that firms rarely share investment banks with product-market competitors due to concerns that proprietary information will be leaked to their competitors. Our results contrast with this prior finding in that we document that firms are more likely to choose to share a bank with rivals and benefit from lower pricing. Finally, our paper contributes to the emerging stream of research that examines peer firms; we document how banks use peers to help choose the firms they lend to and the pricing of these loans.

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Appendix A
Variable Definitions

Allindrawn: All-in-Drawn interest charges over LIBOR, collected from the LPC database.

BANK_EXP: Bank expertise, measured as the natural log of bank$_j$'s dollar lending to borrowers in the same two-digit SIC codes as firm$_i$ in the five years before the firm$_i$'s decision to take on a new bank debt. (We only include the total amount of each loan deal when bank$_j$ serves as the lead arranger.)

COMOVE: The correlation of the firm's earnings (COMPUSTAT data item "ib") with the earnings of the other firms in the bank's portfolio of loans over the past 5 years.

COMPETITION: A measure of the competitiveness of the firm based on Li, Lundholm and Minnis (2012) compiled as the average of two indicator variables. An indicator equal to one if the ratio of "competition" to other words in the 10-K scaled by the number of segments is greater than the mean and zero otherwise; and an indicator equal to one if the ratio of "competition" to other words in the 10-K scaled by the number of segments is greater than the mean and zero otherwise.

DEBT_SIZE: The size of the loan, measured as the facility amount divided by total assets.

EARN: Accounting earnings, measured as earnings before extraordinary items (COMPUSTAT data item "ib") divided by lagged total assets (COMPUSTAT data item "at").

LEND$_{ij}$: An indicator variable that equals one if the bank loan firm$_i$ takes on is arranged by bank$_j$; zero otherwise.

LEND_COMP$_{ij}$: An indicator variable that takes value one if the firm$_i$'s competitors borrow from the bank$_j$ in the five years before the firm$_i$'s decision to take on a new bank debt; and zero otherwise.

LEV: Financial leverage measured as total debt (COMPUSTAT data item "dlc" + "dltt") over total assets (COMPUSTAT data item "at").

MATURITY: Measured as the natural logarithm of maturity in months.

MTB: Market-to-book ratio measured as the market value of total assets (COMPUSTAT data item "prcc_f"* "csho" + "at"- "ceq") divided by total assets (COMPUSTAT data item "at").

OPAQ_D: Financial reporting opacity, measured as an indicator variable that equals one if the first principal component of the absolute value of discretionary accruals from three accruals models is greater than the sample median; zero otherwise. The detailed construction of this variable is provided in Appendix B. .

PC_D: Proprietary costs, measured as an indicator variable that equals one for firms with R&D expenditure, measured as COMPUSTAT data item "xrd" divided by lagged "at", higher than the sample median; zero otherwise.

RATED: An indicator that equals one for firms rated by S&P; zero otherwise.

RATING: The issuer credit rating for the firm, converted from S&P ratings: coded as one representing a rating of D and 22 representing a rating of AAA. If the firm is not rated by S&P then this variable is coded zero.

S_X: Denotes the similarity between a firm and the other borrows the bank lends to. Where similarity in X is measured as negative one multiplied by the absolute difference between firm$_i$'s X and the median X of the firms bank$_j$ lent to within the five years before the firm$_i$'s decision to take on a new bank debt.

SECURITY: Loan security, measured as an indicator equal to one if the facility requires collateral; zero otherwise.

SIZE: Firm size, measured as the natural log of total assets (COMPUSTAT data item "at").

TAKEOVER: An indicator variable that equals one if the purpose of the bank loan is for takeover; zero otherwise.

Z_RANK: Quintile rank of Altman (1968) Z-score. Z-score is compiled as 3.3 times COMPUSTAT data items "pi + xint" divided by COMPUSTAT data item "at" plus 1.2 times COMPUSTAT data item "act" – "lct" divided by COMPUSTAT data item "at" plus COMPUSTAT data item "revt" divided by COMPUSTAT data item "at" plus 1.4 times COMPUSTAT data item "re" divided by COMPUSTAT data item "at" plus .6 times the product of COMPUSTAT data items "chso" and "prcc_f" divided by COMPUSTAT data item "lt".

Appendix B
Construction of the variable _OPAQ_D_

ABACC1: the absolute value of current discretionary accruals calculated based on Teoh, Welch, and Wong (1998). The model is estimated annually for each Fama/French (1997) industry group and each industry-year regression requires at least 20 observations. Based on Teoh, Welch, and Wong (1998) we first estimate the following regression to get the estimated coefficients (variables are defined below).

$$\frac{Current\_Accc}{LagTA} = \gamma_1 \frac{1}{LagTA} + \gamma_2 \frac{\Delta Rev}{LagTA} + \eta$$

The second step calculates the absolute value of discretionary accruals as:

$$\left| \frac{Current\_Acc}{LagTA} - \hat{\gamma}_1 \frac{1}{LagTA} - \hat{\gamma}_2 \frac{(\Delta Rev - \Delta AR)}{LagTA} \right|$$

ABACC2: the absolute value of total discretionary accruals calculated based on Dechow, Sloan, Sweeney (1995). The model is estimated annually for each Fama and French (1997) industry group and each industry-year regression requires at least 20 observations. We first estimate the following regression to get the estimated coefficients (variables are defined below).

$$\frac{Total\_Acc}{LagTA} = \alpha_1 \frac{1}{LagTA} + \alpha_2 \frac{\Delta Rev}{LagTA} + \alpha_3 \frac{PPE}{LagTA} + \varepsilon$$

The second step calculates the absolute value of discretionary accruals as:

$$\left| \frac{Total\_Acc}{LagTA} - \hat{\alpha}_1 \frac{1}{LagTA} - \hat{\alpha}_2 \frac{(\Delta Rev - \Delta AR)}{LagTA} - \hat{\alpha}_3 \frac{PPE}{LagTA} \right|$$

ABACC3: the absolute value of total current accruals calculated based on Dechow and Dichev (2002). The model is estimated annually for each Fama/French (1997) industry group and each industry-year regression requires at least 20 observations. ABACC3 is the absolute value of the estimated residual from the following model.

$$\frac{Current\_Acc}{LagTA} = \theta_0 + \theta_1 (\frac{CFO}{LagTA})_{t-1} + \theta_2 (\frac{CFO}{LagTA})_t + \theta_3 (\frac{CFO}{LagTA})_{t+1} + v$$

where

Current_Acc = Earnings before extraordinary items − Cash flow from operating activities − Depreciation (COMPUSTAT data items "ib"− "oancf" + "dp");
Total_Acc = Earnings before extraordinary items − Cash flow from operating activities (COMPUSTAT data items "ib" − "oancf");

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LagTA   = Lagged total assets (COMPUSTAT data item "at");

CFO   = Cash flow from operating activities (COMPUSTAT data item "oancf");
ΔRev   = Change in sales (COMPUTSTAT data item "revt");

ΔAR   = Change in accounts receivables (COMPUSTAT data item "rect").

PPE   = property, plant and equipment (COMPUSTAT data item "ppent").

After the three accruals metrics are measured we then extract the first principal component from the three proxies. If the first principal component is greater than the sample median then OPAQ_D is equal to one; zero, otherwise.

Table 1
Descriptive Statistics

Descriptive Statistics Partitioned on Whether the Firm Borrows from a Certain Lender. (An indicator variable LEND that equals 1 if the bank loan that the firm takes on is arranged by a bank who has lent to the firm's rival; 0 otherwise.)

	LEND=1		LEND=0	
Variable	Mean	Median	Mean (t-stats for the difference)	Median (z-stats for the difference)
LEND_COMP	0.459	0.000	0.310 (10.46)***	0.000 (10.38)***
S_Size	-0.189	-0.156	-0.218 (5.10)***	-0.181 (5.33)***
S_MTB	-0.537	-0.260	-0.566 (1.20)	-0.267 (0.96)
S_LEV	-0.542	-0.426	-0.585 (2.53)**	-0.449 (2.36)**
S_EARN	-1.679	-0.926	-1.967 (3.33)***	-0.996 (2.64)***
OPAQ_D	0.494	0.000	0.501 (-0.44)	1.000 (-0.44)
PC_D	0.444	0.000	0.444 (0.02)	0.000 (-0.02)
SIZE	7.817	7.718	7.880 (-1.16)	7.759 (-1.18)
BANK_EXP	24.162	24.362	23.880 (7.70)***	24.085 (8.14)***
COMOVE	0.063	0.025	0.094 (-1.16)	0.020 (0.40)
N	1,279		6,981	

Note: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively.
Variable definitions are presented in Appendix A.

Table 2
Correlations

Pearson Correlations among Variables (and p-values)

	LEND_ COMP	S_SIZE	S_MTB	S_LEV	S_EARN	OPAQ_D	PC_D	SIZE	BANK_EXP	COMOVE
LEND	0.114 (0.001)	0056 (0.001)	0.013 (0.231)	0.028 (0.011)	0.037 (0.001)	-0.005 (0.718)	0.000 (0.983)	-0.013 (0.248)	0.084 (0.001)	-0.013 (0.247)
LEND_ COMP		0.029 (0.008)	0.037 (0.001)	0.077 (0.001)	0.054 (0.001)	-0.020 (0.069)	0.064 (0.001)	0.117 (0.001)	0.178 (0.001)	0.008 (0.459)
S_SIZE			0.020 (0.062)	0.047 (0.001)	0.006 (0.578)	0.011 (0.339)	0.017 (0.128)	-0.114 (0.001)	-0.015 (0.189)	-0.020 (0.063)
S_MTB				0.141 (0.001)	0.417 (0.001)	-0.146 (0.001)	-0.157 (0.001)	0.081 (0.001)	-0.051 (0.001)	0.049 (0.001)
S_LEV					0.138 (0.001)	-0.064 (0.001)	0.097 (0.001)	0.131 (0.001)	0.029 (0.007)	0.015 (0.180)
S_EARN						-0.194 (0.001)	-0.077 (0.001)	0.102 (0.001)	-0.037 (0.001)	0.034 (0.002)
OPAQ_D							0.026 (0.018)	-0.188 (0.001)	0.004 (0.746)	-0.049 (0.001)
PC_D								0.111 (0.001)	0.258 (0.001)	0.011 (0.306)
SIZE									0.215 (0.001)	0.073 (0.001)
BANK_EXP										0.020 (0.072)

Variable definitions are presented in Appendix A.

Table 3
Lender Choice

Probit Model of the Determinants of Firm's Decisions to Take on Bank Loan Arranged by Bank_j

Variables	Predictions	Model 1 Coefficients (z-stats)	Model2 Coefficients (z-stats)	Model 3 Coefficients (z-stats)
Intercept	?	-3.197 (-6.07)***	-3.340 (-5.78)***	-3.390 (-6.70)***
COMPETITION	?			-0.094 (-2.27)**
LEND_COMP	+	0.311 (3.20)***	0.302 (2.91)***	0.182 (1.31)*
LEND_COMP*COMPETITION	+			0.225 (2.32)**
OPAQ_D	?		-0.081 (-2.49)**	-0.069 (-1.67)*
OPAQ_D*LEND_COMP	+		0.183 (3.43)***	0.062 (0.69)
OPAQ_D*LEND_COMP* COMPETITION	+			0.233 (2.02)**
PC_D	?		-0.001 (-0.03)	-0.012 (-0.37)
PC_D*LEND_COMP	-		-0.175 (-2.72)***	-0.035 (-0.34)
PC_D*LEND_COMP* COMPETITION	-			-0.260 (-1.75)**
S_SIZE	+	0.495 (3.49)***	0.503 (3.53)***	0.619 (3.56)***
S_MTB	+	0.001 (0.01)	-0.008 (-0.31)	-0.010 (-0.28)
S_LEV	+	0.048 (1.62)*	0.052 (1.70)**	0.066 (2.05)**
S_EARN	+	0.023 (1.61)*	0.023 (1.68)**	0.032 (2.01)**
SIZE	?	-0.033 (-0.71)	-0.032 (-0.68)	-0.035 (-0.66)
BANK_EXP	+	0.103 (2.67)***	0.111 (2.64)***	0.118 (2.97)***
COMOVE	-	-0.025 (-2.27)**	-0.025 (-2.32)**	-0.286 (-1.97)**
N		8,261	8,261	6,776
Pseudo-R Squared		0.0272	0.0295	0.0346

Note: ***, ** and * represent 1%, 5%, and 10% significance levels, respectively (2-tailed or 1-tailed, as appropriate). The standard errors are two-way clustered at the firm and lender levels. Variable definitions are presented in Appendix A.

Table 4
Loan Pricing Descriptive Statistics Partitioned on *Lend_Comp* (whether lender has lent to rivals in the past 5 years)

	LEND_COMP=1		LEND_COMP=0	
Variable	Mean	Median	Mean (t-stats for the difference)	Median (z-stats for the difference)
Allindrawn	114.1	87.500	127.1 (-2.12)***	100.000 (-1.65)*
OPAQ_D	0.528	1.000	0.498 (0.97)	0.000 (0.97)
PC_D	0.431	0.000	0.439 (-0.27)	0.000 (-0.27)
SIZE	7.769	7.686	7.736 (0.31)	7.656 (0.49)
MTB	2.049	1.617	1.853 (2.68)***	1.492 (2.57)**
LEV	0.248	0.237	0.295 (-4.00)***	0.279 (-3.86)***
EARN	0.067	0.064	0.056 (1.99)**	0.053 (2.62)***
Z_RANK	2.146	2.000	1.857 (3.29)***	2.000 (3.27)***
DEBT_SIZE	206.9	134.487	189.2 (1.30)	111.633 (1.88)*
MATURITY	3.605	4.076	3.561 (1.01)	3.871 (0.44)
SECURITY	0.499	0.000	0.469 (0.76)	0.000 (0.76)
TAKEOVER	0.109	0.000	0.066 (2.49)**	0.000 (2.47)**
N	504		519	

Note: ***, ** and * represent 1%, 5%, and 10% significance levels, respectively

Variable definitions are presented in Appendix A.

Table 5
Loan Pricing OLS Model

Analysis of How Having the Same Lender Affects Loan Pricing

		Model 4	Model 5
Variables	Prediction	Coefficients (t-stats)	Coefficients (t-stats)
Intercept	?	271.086 (13.61)***	252.374 (12.46)***
LEND_COMP	−	-10.096 (-1.74)**	6.240 (0.85)
OPAQ_D	+		27.663 (3.87)***
OPAQ_D*LEND_COMP	-		-25.891 (-2.74)***
PC_D	?		-4.170 (-0.55)
PC_D*LEND_COMP	−		-4.735 (-0.50)
SIZE	−	-20.924 (-11.32)***	-20.019 (-10.81)***
MTB	?	-2.186 (-0.83)	-2.749 (-1.05)
LEV	+	57.124 (2.88)***	55.804 (2.86)***
EARN	−	-88.708 (-2.28)**	-88.242 (-2.34)**
Z_RANK	-	-8.844 (-3.01)***	-8.462 (-2.88)***
DEBT_SIZE	?	-0.056 (-4.12)***	-0.057 (-4.16)***
MATURITY	+	2.796 (0.81)	3.139 (0.92)
SECURITY	+	88.116 (12.55)***	86.427 (12.11)***
TAKEOVER	+	27.677 (2.50)**	28.853 (2.62)***
N		1,023	1,023
R Squared		0.4697	0.4803

Note: ***, ** and * represent 1%, 5% and 10% significance levels, respectively (2-tailed or 1-tailed, as appropriate). The standard errors are clustered at the firm level.

Variable definitions are presented in Appendix A.

Table 6
The Effect of Borrower Bargaining Power on Interest Rate Reduction Due to Sharing
Lenders with Rivals

Variables	Prediction	High Borrower Bargaining Power Coefficients (t-stats)	Low Borrower Bargaining Power Coefficients (t-stats)
Intercept	?	280.705 (8.00)***	257.399 (8.88)***
LEND_COMP	−	8.883 (1.22)	-0.361 (-0.04)
OPAQ_D	+	38.711 (3.59)***	27.257 (1.86)**
OPAQ_D*LEND_COMP	-	-44.586 (-2.92)***	-9.571 (-0.82)
PC_D	?	-16.200 (-1.54)	4.938 (0.51)
PC_D*LEND_COMP	−	7.789 (0.53)	-16.205 (-1.34)
SIZE	−	-18.409 (-6.07)***	-25.223 (-9.49)***
MTB	?	-0.782 (-0.20)	-0.929 (-1.08)
LEV	+	-11.962 (-0.42)	80.558 (3.20)***
EARN	−	-251.684 (-3.30)***	-42.094 (-1.08)
Z_RANK	-	-10.532 (-2.36)**	-8.655 (-2.46)**
DEBT_SIZE	?	-0.023 (-0.83)	-0.080 (-5.33
MATURITY	+	-3.982 (-0.83)	11.242 (2.60)***
SECURITY	+	118.618 (8.86)***	69.798 (9.28)***
TAKEOVER	+	31.065 (1.87)**	20.0654 (1.51)*
N		448	575
R Squared		0.5361	0.4625
Equality of coefficient on LEND_COMP		χ^2 = 1.27, p-value = 0.260	
Equality of coefficient on OPAQ_D*LEND_COMP		χ^2 = 3.65, p-value = 0.056	

Note: ***, ** and * represent 1%, 5% and 10% significance levels, respectively (2-tailed or 1-tailed, as appropriate). The standard errors are clustered at the firm level.

Variable definitions are presented in Appendix A.