

**STRUCTURE AND PRICING OF SYNDICATED LOANS**

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# Structure and Pricing of Syndicated Loans

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## **Abstract**

In this paper, we study the determinants of loan spreads in the syndicated loan market by focusing on its relationship with the syndicate structure. The benefits of diversification and cost of agency related to the share of the loan retained by the lead arranger have opposing price effects. By looking at the relationship between prices, we are able to better understand the dynamics of this market. The instrumental variables approach is employed to address the joint determination of the loan price and syndicate structure. Using over 25,000 loans from 1988 to 2004, we show that there is a persistent negative relationship between the loan yield and the share of the loan retained by the lead arranger. We conclude that, in this market, the agency problem and cost of borrowing can be effectively reduced by controlling the share retained by the lead arranger. This result also suggests that the syndicated loan market is competitive, putting bargaining power in the hands of the borrower. Some preliminary results suggest the predominance of adverse selection in the syndicated loan market. We incorporate information on covenants and other contractual features not addressed in previous literature.

## **1. Introduction**

In simple terms, syndication is a form of risk sharing that allows financial institutions to enter large transactions. It is an old and important practice used in security underwriting, insurance, venture capital and more recently in commercial loan markets.<sup>1</sup> Despite being a relatively new practice for corporate loans, total issuance of syndicated loans in the United States alone grew from approximately \$150 billion in 1987 to \$2 trillion in 2004.

Syndicated loans effectively represent a sale at the loan's origination, even though the lead arranger is never responsible for the full commitment and only retains a fraction of the loan. Multiple banks can participate in a loan and hold direct claims against the borrower. However, the key point is that only the lead arranger conducts the due diligence of the client and monitors the loan after its origination. This set-up allows the reduction of information production costs, but, at the same time, it creates an information asymmetry problem between the lead arranger and syndicate participants. The issue of the tradeoff between diversification and agency is a topical not only for loan syndication but also for other areas such as hedge fund research.

To the best of our knowledge, this is the first paper to analyze determinants of the loan spreads for the syndicated loan market. Previous literature focused on the determinants of the syndicate structure as represented by the share of the loan retained by the lead arranger. In this paper, we investigate the determinants of the interest rates by focusing on the joint nature of the loan spreads and the syndicate structure. Using a large sample of loans from 1988 to 2004, we show that there is persistent negative relationship between price and structure suggesting that the agency problem can be effectively reduced by increasing the

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<sup>1</sup> Syndication goes back in time for over a century. See Galston (1928) for the discussion of syndication in the bond underwriting market.

share retained by the lead arranger. We also suggest that price implications allow us to pin down the type of agency problem (moral hazard vs. adverse selection) that predominated in this market. We conduct our analysis for syndicated loans using the instrumental variables approach to account for joint determination of the loan price and syndicate structure.

The topic of this paper fits within a broader debate that looks at managerial ownership and the company's performance. The share of the loan retained by the lead arranger can be thought of in a similar way as the managerial stake in the company, which can be used to align a manager's and outside shareholder's incentives. Demsetz and Villalonga (2001) present an overview of empirical literature on managerial ownership and company's performance. What makes the problem of the syndicated loans different is that the ownership in question is ownership of an intermediary, thus adding an additional layer to the agency problem. Managerial ownership literature suggests that if the ownership structure is determined endogenously under the shareholder's influence, there should be no systematic relationship between ownership structure and firm performance. However, deviation from the full-information loan holding due to the information asymmetry between the lead arranger and syndicate participants would have implications on the loan prices.

Despite the popularity of syndication in the financial industry, there are very few papers that look at the patterns of syndication and motives behind it. In general, the research on different aspects of syndication remains very fragmented. Wilson (1968) looks at syndication in re-insurance and Lerner (1997) investigates the reason to join the venture-capital syndicate, but it wasn't until recently that several empirical papers including Corwin and Stultz (2005), Song (2004), Naratanan, Rangan and Rangan (2004) started to

investigate the decision to join the security-underwriting syndicate. The most recent theoretical paper on the subject by Pichler and Wilhelm (2001) also looks at the security underwriting market.

Literature related to the syndicated loan market can be divided into two groups. One group investigates reasons for loan sales, with syndication as a form of loan sale. The list of these papers include Pennacchi (1988), Pavel and Phillis (1987), Gorton and Pennacchi (1995), and Demsetz (1999). These papers show that the main reasons for loan sales are regulatory restrictions (capital requirements and sole lender exposure) and diversification. The other group, which comprises Simons (1993), Dennis and Mullineaux (2000), Jones, Lang and Nigro (2000), Lee and Mullineaux (2001), Panyagometh and Roberts (2002), and Sufi (2005), looks at the determinants of the syndicate structure where the syndicate structure is the share retained by the lead arranger, concentration of the syndicate and the number of participants. The general finding is that, together with loan contract characteristics and credit risk of the borrower, information transparency of the borrower, as indicated by the availability of public information, is a key determinant of the syndicate structure. Thus, as credit risk of the borrower increases, as measured by the credit rating, loan size, maturity of the loan, and other features, the share of the lead arranger goes down. Another result throughout the literature is that loans are more likely to be syndicated and sold in larger portions as information about borrower becomes more transparent. This relationship between syndicate structure and information opaqueness of the borrower was previously interpreted as the presence of an agency problem between the lead bank and participants of the lending syndicate. However, this finding is also consistent with banks

trying to preserve power (information monopoly) of the client. The results of this paper allow us to distinguish between these two hypotheses.

There are two types of agency problems that we can observe in the syndicated loans market. The moral hazard problem is an ex-post problem of information asymmetry, and it is related to the fact that when the lead sells parts of the loan to a “passive” lender and keeps monitoring duties to himself, his incentives to monitor are reduced similar to Pennacchi (1988), Gorton and Pennacchi (1995) or Jensen and Meckling (1976). The adverse selection problem is an ex-ante problem that arises due to the fact that the bank has private information about the borrower that it cannot credibly communicate to the participants in the syndicate. Under these conditions, there would be an additional premium due to the fact that the lead bank would have an incentive to give away bad or risky loans. It is because of these problems that classical banking literature concludes that loans should be non-tradable securities. Both problems have the same effect on the structure of the syndicate. That is, the larger the information opaqueness of the company, the larger the share retained by the lead arranger. Therefore, the setting does not enable us to distinguish which problem is predominant in this market. Intuitively, that median sole lender loan to a non-rated borrower is 7 million while a median lead arranger commitment in a syndicated loan to a non-rated company ranges from 15 million for smaller loans up to 60 million for large loans.<sup>2</sup> This potential individual exposure seems to suggest that a predominant problem in this market is ex-ante adverse selection rather than ex-post monitoring of the loan. Recent introduction of loan rating system seems to suggest the same. We investigate this issue further finding some support to the hypothesis of the

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<sup>2</sup> The numbers are calculated using Dealscan. The median of 7 million for sole lender loans is overstated because Dealscan mainly covers syndicated loan market and only picks up large sole lender loans.

predominance of adverse selection in the syndicated loan market. We incorporate information on covenants and other contractual features not addressed in previous literature.

Thus both groups of the literature, those that look at the reasons for loan sales and those that look at the determinants of syndicate structure, ignore the loan spreads assuming that loan prices are determined exogenously. However, the evidence shows that price and structure of the loans are determined in a bargaining process that takes place between the lead bank and the potential participants after the non-price characteristics of the loan are set. Since 1998, a new standard of “market-flex language” was adopted, allowing the lead arranger to change the pricing of the loan according to the market demand after the award of the mandate. But even before that, the implicit link between loan price and syndicate structure was clear to the market as banks competed for the mandate awards based on their syndication strategies. Additionally, before the relaxation of the price setting process, the syndicated loans were underwritten under the best-effort criteria. Therefore, if at a fixed priced the deal wasn’t fully subscribed, the loan wouldn’t go through, making it essentially the same as the new procedure. We address the issue of the endogeneity of the structure by using instrumental variables approach.

The rest of the paper is structured as follows. Section 2 outlines economic structure of the model and analyses the potential relationship between the syndicate structure and interest rates on the loans. In Section 3 we discuss the data source and overview the key variables. Section 4 presents empirical results, and Section 5 concludes.



## **2. Empirical model**

### **2.1 Contracting Environment**

In basic terms, loan syndication is a process whereby a bank sells a share in a loan to other financial institutions. Although there is a single loan agreement contract, every syndicate member has a separate claim on the debtor. The lead lender is chosen by the borrower to originate and syndicate the loan and is usually called the “arranger”. The arranger conducts due diligence of the borrower and produces a confidential memorandum that is presented to potential investors. Also, information presented by the lead arranger represents the basis of sale; there is no fiduciary duty between the agent and syndicate members. The fee for the syndication, including due diligence, is typically set forth in a separate agreement between the borrower and arranger. Alternatively, the compensation is included in an up-front fee. While it is believed to be between 0.1 and 0.2 of a percentage point of the value of the loan, these fees are generally not disclosed to participants. As part of the syndication process, the arranger will typically retain a share of the loan and act as “administrative agent” (“agent”) performing the monitoring duties.

In a traditional syndicated deal, an arranger bank negotiates the terms and conditions of the loan with the company and then contacts other institutions to provide parts of that credit. Thus, a syndication process can be divided into two stages. In the earlier stage, after the company assigns the mandate to lead, the non-price characteristics of the loan contract such as amount, maturity, collateral, and covenants are set. In the next stage, the manager syndicates the deal to a group of participants. All of the participants will have pro-rata claims against the borrower, however the managing and monitoring of the loan is delegated to the

lead arranger. As in the case of due diligence, only the lead arranger is rewarded for the monitoring.

## **2.2 Cost and benefits of syndication: implications on price**

On the up-side, the rationale for the loan syndication seems to be simple: syndicates help keep old customers and acquire new ones. Syndicated loans allow banks to compete with the public market in large transactions that a sole lender wouldn't otherwise be able to underwrite due to internal and regulatory restrictions. Consistent with this point, Table 1 shows that percentage commitment of the lead arranger dramatically reduces with the size of the loan. On the other hand, the ancillary business is an important selling point in syndication. Arranging investment-grade loans is not profitable for banks by itself. Multiple sources mention that banks participate in syndicated deals to build relationships and to cross sell other products. One of the key aspects that differentiate a syndicated loan from multiple sole lender loans is that due diligence and monitoring of the loan are delegated to the lead bank allowing reduce costs to the syndicate participants by avoiding staff, monitoring and origination costs. However, this benefit comes at a cost. The theory predicts that due to the information content of a lending relationship, loan sales would produce an agency problem between the selling bank and the buyer. Thus diversification and reduced management cost suggest a positive relationship between syndicate structure as measures by the share retained by the lead arranger and the loan yield. However agency problem that appears due to asymmetry of information between lead arranger and syndicate participants indicates a negative relationship between share of the lead arranger and loan yield. The actual relationship between benefits and costs is ultimately an empirical question.

Interestingly, a glance at the loan prices in the Table 2 documents that syndicated loans, as a group, are cheaper than sole lender loans. In a different study, Angbazo, Mei and Saunders (1998) investigate determinants of the spreads on highly leveraged loans finding evidence that syndicated loans have lower spreads. Dennis, Nandy and Sharpe (2000) examine the determinants of contract terms on revolving loans finding similar results. This result is even more pronounced for the not-rated loans where the agency problem would tend to be more severe. This seems to suggest that the agency problem is not an issue. However syndicated loans are likely to be just a different type of loans, thus the relationship between costs and benefits of syndication needs further investigation.

### 2.3 Econometric model

Loan price and syndicated structure are two variables that are jointly set by the supply side of the loan market and therefore, treating them as exogenous variables would produce biased inference. We estimate the loan price equation recursively using a syndicate structure fitted to address the relationship between price and structure. Our empirical model consists of two equations: one for syndicated structure, and for loan yield. We use three alternative measures for syndicated structure: share retained by the lead arranger, Herfindahl concentration index and number of participants excluding lead arrangers.

- (1) **Syndicate structure** =  $f[(\text{borrower's characteristics, loan non-price characteristics, lender characteristics}) + \textit{instruments}]$
- (2) **Loan yield** =  $f[(\text{borrower's characteristics, loan non-price characteristics, lender characteristics}) + \textit{syndicated structure fitted value}]$

Equation (1) corresponds to a reduced form regression of the syndicated structure. A necessary condition for this system to be identified is the order condition, requiring that

equation (1) exclude at least one variable from among all the explanatory variables in used in the equation (2). In our main formulations, we use two different instruments thus this condition is satisfied here and consistent estimates can be obtained using 2SLS method.

Another requirement is that our instruments have to be both valid and strong. Our main set of instruments includes a type of general covenant called “voting rights”. Table 3 presents a general distribution of different covenants included in the loan contracts. There are two main categories of covenants: financial covenants and general covenants. Financial covenants are clearly related to the credit characteristics of the borrower and therefore to the price, however it is not so for all of the general covenants. In particular voting rights include three types of covenants all related to the percent of lenders required in the syndicate to approve the non-material changes and waivers. Unless specified an agreement of all lenders would be required to pass any changes to the loan. The anecdotal evidence indicates that on one hand non-material changes to the loan are not uncommon on the other hand coordinating among all the members of the syndicate can be costly and unnecessary. Notice that this kind of amendments is very different to the renegotiation of the contract. Specific non-material nature of the covenants and it’s clear relationship with the structure of the syndicate makes this is a sound economic instrument that is directly related to the structure of the syndicate while having only a second order (if any) relationship with the loan yield.

We also include prepayment covenants in particular we focus on the debt issuance sweep that requires borrowers to payoff outstanding loans if they issue new ones. The economic intuition for this instrument is that issuance of new syndicated loans could change the balance among the syndicate participants that was taken into account at the

issuance of the outstanding loan thus being related mainly to the structure of the syndicate. Finally, we consider a dummy for syndicates that have commercial banks as participants. Because participation in a lending syndicate is a passive role any financial institution could do it. Thus together with commercial banks it is common to see financial institutions and institutional investors such as mutual fund, hedge funds, prime funds and others to actively participate in the syndicated lending. As opposed to other type of participants commercial banks have internal and regulatory restriction on the amount that they can invest in one loan. Therefore, due to this restrictions, we expect that presence of a commercial bank as a participant (not as an underwriter) could affect the structure of the syndicate but not the pricing. Statistical tests indicate validity and strength of these instruments. They are correlated with structure but not with the loan yield. And as indicated in the reduced form regressions (Table 4) the instruments are jointly significant in their first-step equation with F-test in excess of 10. Since we only require one instrument for the system to be identified, we use but do not report alternative specification confirming the robustness of the results.

There are potential problems due to the unobserved borrower's heterogeneity. In particular, the sorting of borrowers among banks is likely to be non-random. We address this issue by explicitly controlling for borrower's characteristics and i year fixed effects.

### **3. Data and variables overview**

Our starting sample includes 25,440 syndicated dollar denominated confirmed loans issued between 1988 and 2004 and involving 9,985 different U.S. borrowers excluding regulated and financial industries (1-digit SIC code 4 and 6). The data was collected using the Loan Pricing Corporation (LPC) Dealscan database that contains detailed term information on loan origination dating back to 1988. Originally the data was

collected from the SEC and Federal Reserve filings and confirmed with LPC contributors. According to LPC, the data collection process had changed, and over the past few years, it was relying mainly on contacts within the credit industry. Overall, the data is accurate in registering syndicate loans since LPC is the major data managing company associated with the Loan Syndications and Trading Association (LSTA). In addition, lenders have incentives to report these data since in the syndicated loan market league tables are a powerful marketing tool.

Dealscan provides only limited information about the borrower, thus we proceed to hand match the sample with data available in Compustat. Our matched sample contains 15,791 deals and covers 4,614 borrowers. Not surprisingly, the average number of loans per company is higher in the sample matched with Compustat as we would expect more opaque companies to have fewer syndicated loans and thus less likely to be picked up by the Dealscan data. Several of the variables considered in our analysis such as share of the loan retained by the lead arranger, sales at close have limited not systematic availability. The smaller number of observations reported in the regressions are the result of data availability.<sup>3</sup>

Syndicated loans can be structured in several tranches also called facilities. For the US companies, a syndicated loan, on average, consists of 1.4 facilities per loan with a median equal to 1. Larger loans are likely to be structured in several facilities. Deals structured in multiple facilities represent 30% of the sample. The main differences across the facilities are active date, maturity, amount and loan type (term loan vs. revolver line). Participants, structure of the syndicate and general pricing terms are typically determined at a deal level. Thus, for the deals with multiple facilities, we look at the loan characteristics of the largest

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<sup>3</sup> Each regression will indicate the actual number of observations used in the analysis.

tranche with the earliest active date. This classification doesn't affect significantly the distribution of the contracts by type of the loans.

Working with loan non-price characteristics many times requires subjective criteria since many of the features of the contract are not standardized. In particular, for the US market alone, there are 54 role titles that can be given to a bank in a syndicate and none of these are mutually exclusive. However, many of these titles are meaningless and are used to distinguish the level of commitment across the participants for the purposes of league tables. We divide the syndicate into lead banks and participants. Where available, the administrative agent is defined to be the lead bank, as it is the bank that monitors the loan and handles all payments (S&P, 2003). Other roles that receive the status of lead bank are book runner, lead arranger, lead bank, lead manager, agent and arranger. As a consequence, 4.7% deals have more than one lead arranger.

We measure the cost of financing using the Dealscan variable All in Spread Drawn (AISD) defined as the annual spread paid over LIBOR for each dollar drawn down from the loan. The data on the decomposition of syndication fees is limited further, but could be an interesting area for future work. Syndicated loans are priced using fixed spread over a floating benchmark. The main pricing options include prime, LIBOR and CD rated. Loans priced at a spread over bank's prime lending rate are reset daily. However, the borrower can lock in a given rate for up to one year by choosing CD rate or LIBOR as its base rate. The prime option is more costly to the borrower, yet with fixed rate options the borrower can't prepay the loan without a penalty. We include the base rate as a control variable in the regression analysis. Pricing oftentimes is tied to the performing grids. That is, the spread on the loan increases or decreases according to the company leverage or interest

coverage indicators. Performance pricing can be increasing or decreasing that. In our sample, 22.7% loans include performance pricing provision and 76.5% of these correspond to interest-decreasing contracts and the rest to interest-increasing contracts. These numbers are consistent with Asquith, Beatty and Webber (2004) who investigate inclusion of performance pricing in bank debt contracts finding the interest decreasing pricing is more likely when adverse selection costs between the bank and the borrower are higher while interest-increasing pricing is more common when moral hazard costs are higher.

It is key for this study to measure the opaqueness of information about the borrower as it would proxy for an asymmetry of information between the lead arranger and the syndicate. The idea is that companies that don't have enough information publicly available about them will require more monitoring or will indicate cases where there is a larger ex-ante asymmetry of information between the lead arranger and the syndicate. In the Dealscan sample we measure opaqueness by introducing a dummy for those companies that are publicly rated by any credit rating agency and a dummy for companies that are privately held. In the sample matched with Compustat the alternative measures implied include research and development expenses and the size of accruals.

Inclusion of collateral and covenants reduce the agency problem between manager and the lender. In the starting sample, 42% of the loans have covenants; however over 80% of the loans with a syndicate structure and share available have general covenants. This is of key importance since our instruments include general covenants. As can be observed from Table 3, the covenants don't become popular until 1993, and their use picks up around 1997. These observations are consistent with Bradley and Roberts (2004) who study determinants of covenant structure. They consider six categories including collateral,



dividend restrictions, presence of more than 2 financial covenants and assets, debt or equity sweeps.

To measure lender characteristics, we consolidate lender by parent as well as account for the bank mergers.

## **4. Results**

### **4.1 Determinants of the loan yield spread**

Table 4 presents coefficients for the reduced form regression of the share retained by lead arranger on the explanatory and instrumental variables. Consistent with the previous findings, the share retained by the lead arranger is positively related to the opaqueness of the borrower as measured by the absence of the public debt rating.

Main result of this paper is presented in the Table 5. The dramatic difference between estimates corresponding to the OLS regression of loan yields on the syndicate structure and the second stage results indicates the bias present in the estimates if we don't properly account for the joint underlying determinants of these two variables. The negative coefficient on the structure clearly indicates that observed differences in share retained by the lead arranger are associated to the agency problem. In the case of market power hypothesis a larger share retained by the lead arranger is associated with higher bargaining power of the lender and thus implies a higher loan yield. On the opposite, in case of the agency hypothesis the share retained by the lead arranger is used to ameliorate an information asymmetry between the lead arranger and the syndicate participants, suggesting that larger share retained by the lead arranger should be associated to a lower price. While the economic significance of the coefficients is not large, we should keep in mind that while larger share reduces agency problem it has an adverse impact on the

diversification of the lead arranger. Another important conclusion suggested by these results is that syndicated market is a competitive putting the bargaining power in hands of the borrower. As reported in the Tables 6 and 7, the results are robust to alternative measures of opaqueness, as well as to alternative measures of syndicate structure.

#### **4.2 Type of agency problem: moral hazard vs. adverse selection**

The evidence found in the previous section clearly indicates a presence of the agency problem between in the syndicated loan market. However it is not clear what kind of the agency problem, moral hazard or adverse selection, is predominant in this market. Learning more about the type of the problem could suggest what kind of improvements and standardization could benefit this market. Sufi (2005) attempts to disentangle these two problems by looking at the differences in the syndicate structure for opaque companies that had previous relationship with the lead arranger. He suggests that presence of a previous relationship with the lead arrangers would indicate those cases where lead bank has private information. Presence of the private information would reduce need for monitoring ameliorating an ex-post agency problem but at the same time would accentuate an ex-ante information agency problem. However in his empirical tests he is unable to extract any conclusions in addition to the positive relationship between opaqueness of the borrower and share retained by the lead arranger.

Presence of private information in the hands of lead arranger is a fact. Before loan syndication lead arranger performs due diligence based on public and private information available from the corporate borrower. After that the credit profile is presented to the potential investors in the form of “confidential information memorandum”. The arranger disclaims any responsibility for the accuracy of the information contained in the

memorandum; moreover, such disclaimers are enforceable in court.<sup>4</sup> Also syndicated loan is not considered to be a “security” for the purposes of application of the Security Act of 1933 and the Securities and Exchange Act of 1934 which leaves the due diligence standards to the criteria of the lead arranger. In this sense the ex-ante asymmetry of information between the lead and syndicate participants is a regular setup and situations where the borrower had a previous relationship with lead arranger hardly at best would indicate situation where this asymmetry is more pronounced. But one has to be careful in thinking about this issue. The current theoretical literature doesn’t have implications for situations with more or less asymmetry of information. In particular, the implication of the Leland and Pyle (1977) model expand for the companies with different volatilities but not for the companies that are more or less informational transparency.

From an empirical perspective, Dealscan mainly covers syndicated loans, therefore measured using Dealscan past relationship could indicate credit quality of the borrower as perceived by the syndicated loan market and not the amount of private information in hands of the lead arranger. In other words, in this context past relationship would be an alternative measure of opaqueness, absence of a relationship indicating higher opaqueness of information. Not surprisingly conducting tests by looking only at the syndicate structure just replicates the result of higher opaqueness being associated with the larger share of the lead arranger. And again, opaqueness measured by the previous exposure of the borrower to the syndicated loan market doesn’t unable to distinguish agency and market power hypothesis.

As mentioned before, the current literature on adverse selection indicates that ownership can be used as a signal of the quality of the project. Ownership is a costly signal

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<sup>4</sup> Commercial Lending Review, May 2004; American Banker, February 2005.

in a sense that larger ownership would be associated with undiversified position and higher risk. We use dummy for not rated companies as an indicator of opaqueness. Under moral hazard and adverse selection we expect not rated companies to have more concentrated structure with lead arranger retaining a larger share. In the subset of opaque companies we would expect lead arranger to retain smaller share of the loans with high volatility. By volatility we mean public perception of volatility. In case of the adverse selection it is because the volatility makes the signal more costly and in case of the moral hazard it is because broad structure of the loan (allocating it to multiple lenders) would improve the incentives of the manager acting as a substitute for monitoring.<sup>5</sup> Thus both types of agency would have same implications on the structure however implication on the loan yield would be rather different. In case of moral hazard we would expect that opaque companies with high volatility would have a lower yield than opaque companies with low volatility since reduced share both improves borrower's incentives and improves lead bank's diversification. In case of adverse selection retained share need to be a costly signal of the borrower's quality and therefore this cost would be reflected in higher yield for both high and low volatility.

We use equity return volatility over the previous year of the loan to measure volatility as perceived by the syndicate members. Thus our sample is constrained to publicly traded companies. (Notice that we should've used volatility of returns on assets, which is part of the work in progress.) The results of this section are presented in the Table8. We find strong indicators of adverse selection hypothesis. While the statistical significance is not very high the signs are consistent across deferent measures of syndicate structure.

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<sup>5</sup> The intuition is similar to that of Bolton and Scharfstein (1996).

### **4.3 Work in progress**

As mentioned earlier, there are potential problems in the estimation due to the fact that the sorting of borrowers among banks is likely to be non-random. It is a documented fact that there is sorting by size of the bank and of the borrower. In particular, large banks tend to lend to the large borrowers, while small banks specialize in lending to small borrowers. Currently, this issue is addressed using borrower's characteristics and year fixed effects. An alternative approach would be to construct cluster adjusted standard error to account for correlation within bank groups. In the presented results, we correct covariance matrices following Murphy-Topel standard errors adjustment.

Another aspect that could be potentially bias the coefficients, and therefore needs to be addressed, is the endogeneity of the non-price characteristics of the loan, such as financial covenant and performance pricing features. While non-price characteristics get set before the final structure of the syndicate and loan prices are determined, it is clear that banks' structure loan contracts take into consideration potential demand from participant institutions.

A key variable that would affect the results is the bargaining power of the borrower. Currently, we are assuming that syndicated loan market is competitive, therefore all of the surplus get transferred to the borrower. However, as we know from Rajan (1992), a bank can have an information monopoly over the borrower, a situation that would result in a different implication on the loan price. For now, we explicitly control for borrower's characteristics including a proxy for bargaining power, such as if the company is publicly rated, if it's traded, or it has had syndicated loans before. Addressing this issue directly may be interesting and shed light on the matter of an information monopoly in this market.

Syndicated loans provide an interesting setup where, as opposed to the managerial ownership literature, Demsetz and Villalonga (2001), it is an intermediary, the lead arranger, who retains ownership of the loan, creating an additional layer of the agency problem and having a different price implication. Furthermore, in the context of adverse selection, where the lead bank has private information, the degree of information asymmetry between the lead arranger and the syndicate puts an additional dimension to the signaling problem as discussed in Leland and Pyle (1977). Providing a theoretical setup that would account for these issues would be an interesting exercise as well to help understand the relationship between ownership (lead arranger's share) and loan prices.

## **5. Conclusions**

This paper investigates the determinants of loan spreads in the syndicated loan market. In particular, we focus on the relationship between spreads and syndicate structure. While the previous literature documents that the lead arranger retains a larger share in loans issued to opaque companies, there are alternative interpretations that can explain this finding. Also, the benefits of diversification and cost of agency related to the share of the loan retained by the lead arranger have opposing price effects. By looking at the relationship between prices, we are able to distinguish the agency problem. The instrumental variables approach is employed to address the joint determination of the loan price and syndicate structure. Using a large sample of loans, we show that there is a persistent negative relationship between the loan yield and the share of the loan retained by the lead arranger. We conclude that, in this market, the agency problem and cost of borrowing can be effectively reduced by controlling the share retained by the lead arranger. This result also suggests that the syndicated loan market is competitive, putting bargaining

power in the hands of the borrower. We also find that opaque volatile companies have a significantly higher cost of financing, which would suggest that an adverse selection problem is predominant in this market.

## References

Angbazo, Lazarus, Jianping Mei and Anthony Saunders, 1998, Credit spreads in the market for highly leveraged transaction loans, *Journal of Banking and Finance* 22, 1249-1282.

Asquith, Paul, Anne Beatty and Joseph Weber, 2004, Performance pricing in bank debt contract, Working Paper.

Bolton, Patrick and David S. Scharfstein, 1996, Optimal debt structure and the number of creditors, *Journal of Political Economy* 104 (1), 1-25.

Bradley, Machael and Michael R. Roberts, 2004, The structure and pricing of corporate debt covenants, Working Paper, Fuqua School of Business.

Carey, Mark, Mitch Post, and Steven A. Sharpe, 1998, Does Corporate Lending by Banks and Finance Companies Differ? Evidence on Specialization in Private Debt Contracting, *Journal of Finance* 1998, 845-878.

Corwin S.A. and Schultz P., 2005, The role of IPO underwriting syndicates: Pricing, information production, and underwriter competition, *Journal of Finance* 60, 443-486.

Demsetz, Rebecca S. 1999, Bank loan sales: A new look at the motivations for secondary market activity, FRB NY Staff Report 69.

Demsetz, Harold and Belen Villalonga, 2001, Ownership structure and corporate performance, *Journal of Corporate Finance* 7, 209-233.

Dennis, Steven and Donald J. Mullineaux, 2000, Syndicated loans, *Journal of Financial Intermediation* 9, 404-426.

Dennis, Steven, Debarshi Nandy and Ian G. Sharpe, 2000, The determinants of contract terms in bank revolving credit agreements, *Journal of Financial and Quantitative Analysis* 35, 87-110.

- Esty, Benjamin C., 2001, Structuring Loan Syndicates: A Case Study of the Hong Kong Disneyland Project Loan, *Journal of Applied Corporate Finance* 14, 80-98.
- Esty, Benjamin C. and William L. Megginson, 2002, Creditor Rights, Enforcement, and Debt Ownership Structure: Evidence from the Global Syndicated Loan Market, *Journal of Financial and Quantitative Analysis*, (forthcoming).
- Galston, Arthur, 1928, *Security syndicate Operations*, The Ronald Press Company, New York.
- Gorton, G. and George Pennacchi, 1995, Banks and loan sales: marketing nonmarketable assets, *Journal of Monetary Economics* 35, 389-411.
- Hubbard, R. Glenn, Kenneth N. Kuttner and Darius N. Palia, 2002, Are there bank effects in borrowers' cost of funds? Evidence from a matched sample of borrowers and banks, *Journal of Business* 75, 559-580.
- Jensen, Michael C. and William H. Meckling, 1976, Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, *Journal of Financial Economics* 3 (4), 305-360.
- Jones, Jonathan, William Lang and Peter Nigro, 2000, Recent Trends in Bank Loan Syndications: Evidence form 1995 to 1999, Office of the Controller of the Currency, Working Paper.
- Lerner, Josh, 1994, The syndication of venture capital investments, *Financial Management* 23, 16-27.
- Lilly, E. James and Jason Maxwell, 2004, Will syndicate loans and federal securities law collide? *Commercial Lending Review*, May 19 (3), 8-14.
- Lee, Sang Whi and Donald J. Mullineaux, 2004, Monitoring, financial distress, and the structure of commercial lending syndicate, *Financial Management*, Autumn, 107-130.
- Leland, E.Hyne and David H. Pyle, 1977, Information asymmetries, financial structure, and financial intermediation, *Journal of Finance* 32 (2), 371-387.
- Milken Institute, 2004, The U.S. leveraged loan market: A primer, *Milken Institute Research Report*, The Loan Syndications and Trading Association.
- Narayanan, Rajesh P., Kasturi P. Rangan and Nanda K. Rangan, 2004, The role of syndicate structure in bank underwriting, *Journal of Financial Economics* 72, 555-580.
- Panyagometh, Kamphol and Gordon Roberts, 2002, Private Information, Agency Problems and Determinants of Loan Syndication: Evidence from 1987-1999, Working Paper.



- Pavel, Christine and David Phillis, 1987, Why Commercial Banks Sell Loans: An Empirical Analysis, *Federal Reserve Bank of Chicago Economic Perspectives* 14, 3-14.
- Pennacchi, G., 1988, Loan sales and the cost of bank capital, *Journal of Finance* 43 (2), 375-396.
- Pichler, Pegaret and William Wilhelm, 2001, A Theory of the Syndicate: Form Follows Function, *Journal of Finance* 56, 2237-2264.
- Preece, Dianna and Donald J. Mullineaux, 1996, Monitoring, loan renegotiability, and firm value: the role of lending syndicate, *Journal of Banking and Finance* 20, 577-593.
- Simons, Katherine, 1993, Why do banks syndicate loans?, *New England Economic Review*, Federal Reserve bank of Boston, 45-52.
- Song, Wei-Ling, 2004, Competition and coalition among underwriters: The decision to join a syndicate, *Journal of Finance*, 2421-2444.
- Standard & Poor's, 2003, *A Guide to the Loan Market*.
- Sufi, Amir, 2005, Agency and renegotiation in corporate finance: Evidence from syndicate loans, Job market paper.
- Wilson, R., 1968, The theory of syndicates, *Econometrica* 36, 119-132.

## APPENDIX 1: VARIABLES DEFINITIONS

Variable	Definition	Source
<b>A. Loan yield:</b>		
<i>All in Drawn Spread</i>	All-in Spread Drawn is defined as total (fees and interests) annual spread paid over LIBOR for each dollar drawn down from the loan	Dealscan
<i>All in Undrawn Spread</i>	All-in Spread Undrawn is defined as total (fees and interest) annual spread over LIBOR for each dollar available under a commitment	Dealscan
<b>B. Syndicate structure:</b>		
<i>Lead Share</i>	Share of the loan that is retained by lead arranger at the loan origination	Dealscan
<i>Herfindahl Index</i>	Herfindahl concentration index of the loan syndicate defined as the sum of squared share held by each participant (including lead arrangers). It is bounded between 0 and 10,000 with larger number indicating higher levels of concentration	Dealscan
<i>Number of participants</i>	Number of participants (excluding lead arrangers) in the original syndicate	Dealscan
<b>C. Borrower characteristics:</b>		
<i>Private</i>	Dummy variable equal to 1 if the borrower is not publicly traded	Dealscan
<i>Senior Debt Rating NIG</i>	Dummy variable equal to 1 if the borrower's senior debt rating is BB or below using S&P where available and Moody's otherwise	Dealscan
<i>Not rated</i>	Dummy variable equal to 1 if the borrower is not rated or the data is missing	Dealscan/ Compustat
<i>Log (Sales at Close)</i>	Logarithm of the sales at close	Dealscan
<i>Assets Leverage</i>	Total assets in millions Ratio of book value of debt to total assets	Compustat: Data6 Compustat: [Data6- (Data60+Data74)]/Data6
<i>R&amp;D /Sales</i>	Ratio of research and development to sales	Compustat: Data46/Data12
<i>Accruals / Assets</i>	Difference between Operating Activities Net Cash Flow and Income Before Extra Items scaled by assets	Compustat: (Data 123- Data308)/ Data6
<i>Abs. Accruals/ Assets</i>	Absolute value of accruals scaled by total assets	Compustat
<i>Previous syndicated loans</i>	Dummy variable equal to 1 if the borrower was previous issued a syndicated loan	Dealscan
<i>High</i>	Dummy variable equal to 1 if	CRSP

*Volatility* borrower's volatility of stock returns is above volatility of the industry portfolio (2-digit SIC code)

**D. Non-price loan contract characteristics:**

<i>Facility amount</i>	Total facility amount in million dollars	Dealscan
<i>Maturity</i>	Maturity of the facility in months	Dealscan
<i>Collateral</i>	Dummy variable equal to 1 if the loan is secured	Dealscan
<i>Financial covenants</i>	Dummy variable equal to 1 if the loan has financial covenants and otherwise	Dealscan
<i>Dividends restrictions</i>	Dummy variable equal to 1 if the loan has general covenants restricting dividend payment	Dealscan
<i>Prime base rate</i>	Dummy variable equal to 1 if the base rate is Prime	Dealscan
<i>Performance Pricing (increasing)/ (decreasing)</i>	Dummy variable equal to 1 if the loan has increasing/ decreasing performance pricing specified	Dealscan
<i>Revolve Line &lt; 1</i>	Dummy variable equal to 1 if the loan is a revolving line with maturity below one year	Dealscan
<i>Term Loan A</i>	Dummy variable equal to 1 if the loan is a Term Loan A, it corresponds to the type of the loan that is syndicated to commercial banks	Dealscan
<i>Term loan B-D</i>	Dummy variable equal to 1 if the loan is a Term Loan B-D, it corresponds to the type of the loan that is syndicated to institutional investors	Dealscan
<b>E. <u>Lender characteristics:</u></b>		
<i>Lead bank market share</i>	Number of loans lead by the arranger over the year as the percent of total number of loans issued that year (US syndicated dollar denominated loan market)	Dealscan
<i>Relationship within the syndicate</i>	Dummy variable equal to 1 if the lead arranger had a previous relationship with at least one of the members of the syndicate at the lead arranger lever1	Dealscan
<i>Bank Assets</i>	Bank assets in billions	Compustat/ Call reports
<i>Capital Tier 1</i>	Ratio of Tier 1 capital to assets	Compustat/ Call reports

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**TABLE 1: SYNDICATE STRUCTURE BY LOAN SIZE**

This table presents characteristics of the syndicate at loan origination by size quartile. The sample contains completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6). We exclude deals with missing information for senior debt ratings. High yield or non investment grade loans correspond to a borrower rated 'BB' or lower for S&P's ratings and 'Ba' for Moody's ratings. *Institutional investor* is a dummy variable equal to 1 if at least one participant in the original syndicate is an institutional investor. Among others institutional investors include hedge funds, mutual funds, pension funds, distressed funds and insurance companies.

	Investment grade				High-yield				Not rated			
	Obs.	Mean	StdErr	Median	Obs.	Mean	StdErr	Median	Obs.	Mean	StdErr	Median
<i>Quartile 1: Deal amount &lt;\$50 MM</i>												
Maturity (Months)	64	41.80	3.63	36.05	424	39.84	1.14	36.05	4,266	39.37	0.38	36.05
Number of lead arrangers	90	1.02	0.02	1.00	484	1.04	0.01	1.00	5,147	1.02	0.00	1.00
Lead arranger share (%)	23	56.26	5.62	50.00	132	55.35	2.15	50.00	1,106	60.99	0.71	55.56
Lead arranger share (\$ MM)	23	18.48	1.56	19.99	132	15.55	0.69	15.00	1,106	15.39	0.26	15.00
Herfindahl index	22	5265	608	5000	130	5026	207	5000	1,100	5515	71	5000
Total number of members	90	2.67	0.28	2.00	485	2.14	0.07	2.00	5,186	1.89	0.02	2.00
Institutional investor (%)	90	0.00	0.00	0.00	485	0.41	0.29	0.00	5,186	0.40	0.09	0.00
<i>Quartile 2: Deal amount ≥ \$50 MM and &lt;\$100 MM</i>												
Maturity (Months)	115	41.28	2.68	36.05	657	44.57	0.83	42.07	3,316	46.40	0.97	36.40
Number of lead arrangers	162	1.10	0.03	1.00	743	1.03	0.01	1.00	4,299	1.03	0.00	1.00
Lead arranger share (%)	45	46.36	4.15	38.50	246	41.00	1.33	36.93	1,030	45.55	0.61	41.67
Lead arranger share (\$ MM)	45	30.07	2.42	25.00	246	27.64	0.94	25.00	1,030	29.81	0.42	25.78
Herfindahl index	43	3920	370	2800	240	3440	125	2808	990	3857	57	3472
Total number of members	164	3.16	0.17	3.00	748	3.61	0.13	3.00	4,322	3.06	0.03	3.00
Institutional investor (%)	164	0.00	0.00	0.00	748	3.61	0.68	0.00	4,322	1.64	0.19	0.00
<i>Quartile 3: Deal amount ≥ \$100 MM and &lt;\$250 MM</i>												
Maturity (Months)	597	34.55	1.06	31.45	1,419	53.14	0.64	59.47	3,411	48.22	0.43	48.06
Number of lead arrangers	701	1.06	0.01	1.00	1,563	1.07	0.01	1.00	4,195	1.05	0.01	1.00
Lead arranger share (%)	247	24.23	0.99	20.59	468	29.21	0.86	24.00	1,136	31.43	0.53	26.67
Lead arranger share (\$ MM)	247	38.58	1.47	34.00	468	44.51	1.40	36.03	1,136	44.20	0.76	37.08
Herfindahl index	238	1915	95	1516	432	2287	79	1756	1,062	2459	48	2023
Total number of members	706	6.21	0.18	5.00	1,577	6.16	0.14	5.00	4,217	4.94	0.05	4.00
Institutional investor (%)	706	0.00	0.00	0.00	1,577	8.12	0.69	0.00	4,217	3.20	0.27	0.00
<i>Quartile 4: Deal amount ≥ \$250 MM</i>												
Maturity (Months)	2,356	40.09	0.51	48.03	1,722	63.53	0.57	60.76	1,629	52.63	0.64	60.07
Number of lead arrangers	2,533	1.41	0.04	1.00	1,828	1.22	0.03	1.00	1,900	1.20	0.02	1.00
Lead arranger share (%)	980	14.79	0.35	11.73	477	19.45	0.76	14.17	502	19.86	0.71	15.63
Lead arranger share (\$ MM)	980	152.66	8.93	74.38	477	106.49	6.67	65.19	502	96.03	6.34	60.00
Herfindahl index	897	921	25	749	431	1302	63	930	449	1370	62	1033
Total number of members	2,553	14.09	0.20	13.00	1,836	12.24	0.23	10.00	1,912	9.67	0.18	8.00
Institutional investor (%)	2,553	0.51	0.14	0.00	1,836	16.99	0.88	0.00	1,912	6.59	0.57	0.00

**TABLE 2: DIRECT COSTS OF SOLE LENDER AND SYNDICATED LOANS**

This table compares direct costs of sole lender and syndicated commercial loans. The sample contains completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6). Spreads and fees are expressed in basis points per annum. All in Drawn Spread describes the amount the borrower pays for each dollar drawn down. All in Undrawn Spread measures the amount the borrower pays for each dollar available under commitment. The following are the components of the spreads:

$$\text{All in Drawn Spread} = \text{Upfront fee} + \text{Annual fee} + \text{Utilization Fee} + \text{Spread over LIBOR}$$

$$\text{All in Undrawn Spread} = \text{Upfront fee} + \text{Annual fee} + \text{Commitment Fee}$$

Panels A through D disaggregate sample by credit quality using S&P's and Moody's senior debt rating. High yield or non investment grade loans correspond to a borrower rated 'BB' or lower for S&P's ratings and 'Ba' for Moody's ratings.

	Sole lender loans				Syndicated loans				Diff.	t-stat
	Obs.	Mean	StdErr	Median	Obs.	Mean	StdErr	Median		
<i>Panel A: Investment grade</i>										
Deal Amount (\$ MM)	45	64.26	14.49	15.0	3,512	804.32	19.59	425.0	740.06	30.37
Deal Amount / Sales at Close (%)	42	7.79	3.52	0.8	3,365	24.59	1.02	11.2	16.80	4.58
Maturity (Months)	38	29.66	5.99	13.1	3,131	39.12	0.45	36.1	9.46	1.58
All in Drawn Spread	32	77.80	16.64	54.3	2,964	62.41	1.06	45.0	-15.40	-0.92
All in Undrawn Spread	20	15.45	1.70	12.5	2,541	13.30	0.19	10.0	-2.15	-1.26
Upfront Fee	3	34.97	20.84	25.0	387	25.15	1.78	12.5	-9.82	-0.47
Annual Fee	11	11.68	1.35	13.0	936	16.22	0.48	13.0	4.54	3.17
Commitment Fee	15	21.30	3.53	13.0	1,364	32.12	0.53	25.0	10.82	3.03
Utilization Fee	1	12.50	0.00	12.5	261	13.08	0.44	12.5	0.58	1.32
<i>Panel B: High yield</i>										
Deal Amount (\$ MM)	219	31.90	3.71	15.0	4,637	306.83	6.16	180.0	274.92	38.25
Deal Amount / Sales at Close (%)	208	20.73	4.30	9.4	4,436	75.33	6.10	29.4	54.60	7.31
Maturity (Months)	203	34.82	1.96	30.6	4,213	54.69	0.38	60.1	19.87	9.96
All in Drawn Spread	172	282.37	10.08	275.0	4,210	245.13	1.92	250.0	-37.24	-3.63
All in Undrawn Spread	101	46.39	2.67	37.5	2,596	44.88	0.41	50.0	-1.51	-0.56
Upfront Fee	81	85.00	8.09	75.0	1,046	66.23	2.13	50.0	-18.76	-2.24
Annual Fee	42	30.88	5.03	18.8	693	20.55	0.75	15.0	-10.33	-2.03
Commitment Fee	89	39.91	1.87	38.0	2,072	38.93	0.33	40.0	-0.98	-0.52
Utilization Fee	13	15.19	1.99	12.5	248	18.15	2.30	12.5	2.96	0.97
<i>Panel C: Not rated</i>										
Deal Amount (\$ MM)	4,582	11.18	0.32	7.0	15,578	130.41	1.81	72.1	119.24	64.89
Deal Amount / Sales at Close (%)	4,044	56.32	16.43	15.8	11,518	112.03	8.71	32.5	55.71	3.00
Maturity (Months)	4,203	33.58	0.44	24.1	12,562	45.31	0.32	36.2	11.73	21.48
All in Drawn Spread	3,664	295.11	2.20	280.0	12,535	218.72	1.17	200.0	-76.40	-30.67
All in Undrawn Spread	1,569	38.06	0.70	25.0	6,647	34.58	0.25	35.0	-3.48	-4.68
Upfront Fee	1,782	70.76	1.93	50.0	2,433	56.83	1.58	35.0	-13.93	-5.58
Annual Fee	523	28.75	1.75	16.0	2,698	17.57	0.36	12.5	-11.18	-6.25
Commitment Fee	1,471	36.90	0.58	37.5	4,299	37.02	0.30	37.5	0.13	0.19
Utilization Fee	129	16.31	1.87	12.5	552	16.37	1.32	12.5	0.07	0.03
<i>Panel D: Not identified</i>										
Deal Amount (\$ MM)	1,517	7.79	0.15	6.3	1,633	271.19	16.73	100.0	263.41	15.74
Deal Amount / Sales at Close (%)	1,196	33.63	2.47	13.5	1,136	113.75	41.59	26.4	80.12	1.92
Maturity (Months)	1,391	36.78	0.84	24.0	1,522	58.41	0.82	60.1	21.62	18.39
All in Drawn Spread	1,310	310.03	4.04	305.0	1,231	197.60	3.87	175.0	-112.43	-20.10
All in Undrawn Spread	447	41.51	1.06	37.5	829	38.65	0.61	37.5	-2.86	-2.34
Upfront Fee	469	86.76	4.14	50.0	530	76.97	3.55	50.0	-9.79	-1.79
Annual Fee	135	43.16	3.05	25.0	433	18.43	0.99	13.0	-24.73	-7.72
Commitment Fee	388	38.90	0.85	38.0	815	38.81	0.59	38.0	-0.09	-0.09
Utilization Fee	0				0					

**TABLE 3: LOAN COVENANTS**

This table presents distribution of covenants for sole lender and syndicated loans. The sample includes completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6).

	Total Loans	Syndicated Loans	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Financial covenants:</b>																			
<b>1. Coverage</b>																			
Interest Coverage	4,392	4,059	1	2	2	3	8	12	28	31	64	139	190	296	586	660	655	798	917
Fixed Charge Coverage	3,036	1,955			2		4	11	44	239	520	539	366	299	249	259	244	175	85
Debt Service Coverage	2,498	2,224					8	5	45	155	327	426	360	267	219	199	218	174	95
Cash Interest Coverage	157	140						1	4	14	24	32	27	14	14	9	9	5	4
<b>2. Leverage</b>																			
Debt to EBITDA	5,059	4,719					1	8	41	205	481	689	718	589	419	472	473	518	445
Debt to Tangible Net Worth	1,918	957			3	2	13	7	24	177	371	422	248	164	145	116	100	77	49
Leverage Ratio	1,497	1,416					1	8	42	120	264	255	177	125	117	118	101	86	83
Sr. Debt to EBITDA	977	918		1	1			1	1	24	65	106	148	127	73	94	104	139	93
Debt to Equity	137	100							13	10	30	25	12	9	13	7	9	6	3
Loan to Value	9	7											1	3		2	1	2	
Senior Leverage	7	7												2		1	2		1
<b>3. Liquidity</b>																			
Current Ratio	1,671	1,041			4	1	4	10	35	173	369	322	221	134	119	88	79	68	44
Quick Ratio	577	298						2	2	21	81	121	93	67	56	43	45	31	15
<b>4. Tangibility</b>																			
Tangible Net Worth	3,030	1,951			2		4	11	44	239	519	539	366	298	245	259	244	175	85
Net Worth	2,488	2,215					8	5	45	155	326	426	359	265	213	199	218	174	95
EBITDA	1,102	1,008								2	6	23	74	156	148	192	208	199	94
<b>5. Investments</b>																			
CAPEX	2,429	2,237		1			1	1	3	2	15	53	170	452	346	386	369	387	243
<b>General covenants:</b>																			
<b>1. Prepayment</b>																			
Asset Sales Sweep	6,062	5,648		1	1		2	152	232	682	975	1,018	754	505	340	357	366	402	275
Equity Iss. Sweep	5,674	5,284		1	1		1	152	219	675	963	1,004	729	481	316	307	304	316	205
Debt Iss. Sweep	5,640	5,255		1	1		1	150	214	674	963	999	723	478	319	303	288	318	208
Excess CF Sweep	5,340	4,942	1	1	1		1	151	214	676	971	997	710	440	309	256	211	227	174
Insurance Proceeds Sweep	4,405	4,110		1				4	21	69	809	996	710	457	316	288	266	285	183
<b>2. Dividends</b>																			
Dividend Restriction	11,188	9,559	1	1	2	2	6	168	395	841	1235	1473	1350	1151	965	990	961	956	691
% of Net Income	229	208						7	57	84	46	22	5	1	3	2	1	1	
% of Excess CF	42	40						26	5	6	3	1						1	
<b>3. Voting Rights</b>																			
Required Lenders	8,194	8,075		1			3	150	290	616	859	998	957	815	680	731	737	767	590
Term Changes	7,468	7,321		1			2	3	23	358	836	994	932	811	701	724	731	781	571
Collateral Release	4,489	4,392						2	6	200	446	566	574	529	422	448	435	511	350
Loans with financial covenants	11,614	9,553	1	2	6	3	21	38	161	572	1,269	1,527	1,336	1,144	1,055	1,118	1,117	1,147	1,097
Loans with general covenants	11,219	9,584	1	1	2	2	6	169	395	842	1,238	1,473	1,354	1,151	974	995	963	962	691
<b>Total Loans</b>	<b>31,725</b>	<b>25,442</b>	<b>842</b>	<b>917</b>	<b>939</b>	<b>894</b>	<b>1,202</b>	<b>1,388</b>	<b>1,702</b>	<b>1,903</b>	<b>2,593</b>	<b>2,997</b>	<b>2,492</b>	<b>2,302</b>	<b>2,323</b>	<b>2,152</b>	<b>2,152</b>	<b>2,326</b>	<b>2,601</b>

**TABLE 4: LENDER'S SHARE REGRESSIONS**

This table presents first stage regression for shares retained by lead arranger. The sample contains completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6). Each observation in the regression corresponds to a different deal. Borrower's and lender's characteristics are computed as of the earliest date previous to the origination of the loan. For definition of other dependent variables please see Appendix 1. Each regression included year fixed effects jointly significant at 1% level

	(1)		(2)		(3)		(4)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
<b>Borrower's characteristics:</b>								
<i>Senior Debt Rating NIG</i>	5.17	5.42 ***	5.16	5.40 ***	3.28	3.54 ***	3.56	3.17 ***
<i>Not Rated</i>	10.01	11.06 ***	9.97	11.01 ***	7.04	7.90 ***	7.10	6.6 ***
<i>Private</i>	-0.25	-0.31	-0.22	-0.28	0.50	0.71	1.91	2.2 **
<i>Log (Sales at close)</i>	-5.40	-23.38 ***	-5.41	-23.42 ***	-3.21	-15.56 ***	-2.83	-11.72 ***
<i>Previous syndicated loan</i>					-1.11	-1.76 *	-0.91	-1.15
<b>Contract characteristics:</b>								
<i>Facility Amount (\$ MM)</i>	0.00	-4.43 ***	0.00	-4.42 ***	0.00	-4.87 ***	0.00	-4.12 ***
<i>Maturity (Months)</i>	-0.10	-7.83 ***	-0.10	-7.85 ***	-0.11	-7.70 ***	-0.13	-7.12 ***
<i>Collateral</i>					2.49	4.12 ***	2.91	3.95 ***
<i>Financial Covenants</i>					0.66	0.78	-0.09	-0.09
<i>Dividends Restrictions</i>					2.20	2.01 **	0.05	0.03
<i>Prime Base rate</i>					3.76	3.18 ***	-1.89	-2.38 **
<i>Performance Pricing (Decreasing)</i>					-3.01	-4.35 ***	-3.34	-3.35 ***
<i>Performance Pricing (Increasing)</i>					-3.19	-3.60 ***	4.78	3.67 ***
<i>Revolver Line &lt; 1 year</i>					-5.70	-6.58 ***	-5.20	-5.1 ***
<i>Term Loan A</i>					-2.33	-0.98	-5.84	-2.06 **
<i>Term Loan B-D</i>					-2.48	-1.43	-2.79	-1.36
<b>Lender's characteristics:</b>								
<i>Relationship within the syndicate</i>					-44.80	-41.76 ***	-47.23	-36.54 ***
<i>Lead bank market share</i>					-0.15	-3.38 ***		
<i>Bank Assets (\$ B)</i>							-0.004	-3.21 ***
<i>Capital Tier 1</i>							-0.45	-3.91 ***
<b>Instrumental Variables</b>								
<i>VotingRights</i>	-2.98	-8.54 ***	-2.98	-8.57 ***	-1.62	-3.81 ***	-2.23	-4.61 ***
<i>Prepayment</i>	-0.49	-2.90 ***	-0.48	-2.86 ***	-0.45	-3.10 ***	-0.41	-2.46 **
<i>Commercial Bank Participant</i>			27.08	2.33 **				
Observations	5,226		5,226		5,105		3,274	
Adjusted R <sup>2</sup>	0.29		0.29		0.5		0.55	
F-test excluded instruments	30.27		46.82		12.43		14.21	

\*\*\* indicates *p* value of 1%, \*\* indicates *p* value of 5%, \* indicates *p* value of 10%

**TABLE 5: DETERMINANTS OF INTEREST RATE**

This table presents second stage regression for interest rates as defined by All in Drawn Spreads. The estimation method is 2SLS using predicted values for share retained by lead arranger from Table 4. The numbering of the regressions in this table corresponds to the numbers in the Table4. The sample contains completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6). All in Drawn Spread describes the amount the borrower pays for each dollar drawn down. Each observation in the regression corresponds to a different deal. Borrower's and lender's characteristics are computed as of the earliest date previous to the origination of the loan. For definition of other dependent variables please see Appendix 1. Each regression included year fixed effects jointly significant at 1% level. The t-statistics are constructed using Murphy-Topel adjusted standard errors.

	<i>(OLS)</i>			<i>(1)</i>			<i>(3)</i>			<i>(4)</i>		
	Coeff.	t-stat		Coeff.	t-stat		Coeff.	t-stat		Coeff.	t-stat	
<b>Syndicate structure:</b>												
<i>Lead Share (%)</i>	0.92	13.66	***	-2.90	-5.15	***	-3.60	-3.11	***	-2.08	-2.18	**
<b>Borrower characteristics:</b>												
<i>Senior Debt Rating NIG</i>	115.65	24.96	***	127.79	20.79	***	83.97	12.50	***	80.86	12.21	***
<i>Not Rated</i>	64.10	14.20	***	100.55	12.87	***	65.83	6.66	***	57.43	6.52	***
<i>Private</i>	31.99	8.18	***	35.58	7.12	***	25.02	5.74	***	25.96	5.32	***
<i>Log (Sales at close)</i>	-16.28	-13.57	***	-37.29	-10.92	***	-22.21	-5.60	***	-16.55	-5.51	***
<i>Previous syndicated loan</i>							-8.04	-1.94	*	-1.00	-0.23	
<b>Contract characteristics:</b>												
<i>Facility Amount (\$ MM)</i>	-0.01	-2.85	***	-0.02	-4.40	***	-0.02	-3.81	***	-0.01	-3.62	***
<i>Maturity (Months)</i>	-0.13	-1.92	**	-0.61	-5.58	***	-0.91	-5.85	***	-0.94	-5.91	***
<i>Collateral</i>							73.61	18.46	***	76.60	19.32	***
<i>Financial Covenants</i>							-8.04	-1.58		-8.36	-1.66	*
<i>Dividends Restrictions</i>							12.04	2.12	**	171.86	17.96	***
<i>Prime Base rate</i>							199.61	22.81	***	-38.52	-8.14	***
<i>Performance Pricing (Decreasing)</i>							-50.45	-8.84	***	-31.33	-5.11	***
<i>Performance Pricing (Increasing)</i>							-42.66	-6.59	***	17.89	3.11	***
<i>Revolver Line &lt; 1 year</i>							-63.33	-7.60	***	-55.22	-7.60	***
<i>Term Loan A</i>							48.36	3.21	***	25.79	1.59	
<i>Term Loan B-D</i>							109.62	9.79	***	101.94	9.06	***
<b>Lender characteristics:</b>												
<i>Relationship within the syndicate</i>							-171.48	-3.20	***	-103.17	-2.20	**
<i>Lead bank market share</i>							-0.76	-2.38	**			
<i>Bank Assets (\$ B)</i>										0.01	0.86	
<i>Capital Tier 1</i>										-0.93	-1.27	
Observations	5,226			5,226			5,105			3,274		
Adjusted R <sup>2</sup>	0.34			0.23			0.44			0.52		

\*\*\* indicates *p* value of 1%, \*\* indicates *p* value of 5%, \* indicates *p* value of 10%



**TABLE 6: ALTERNATIVE MEASURES OF AGENCY PROBLEM**

This table uses accounting proxies of uncertainty to measure the agency problem. Original sample of completed syndicated loans issued between 1990 and 2004 was matched to COMPUSTAT. Each observation in the regression corresponds to a different deal. Panel A presents results of the reduced form regression for *Lead share*. Panel B correspond to the second stage regression of *All Drawn in Spread*. Borrower characteristics are computed as of the earliest date previous to the origination of the loan. For definition of other dependent variables please see Appendix 1. Each regression included year fixed effects jointly significant at 1% level. The t-statistics are constructed using Murphy-Topel adjusted standard errors.

	(1)			(2)			(3)		
	Coeff.	t-stat		Coeff.	t-stat		Coeff.	t-stat	
<i>Panel A: Dependent variable Lead share</i>									
<b>Borrower characteristics:</b>									
<i>Senior Debt Rating NIG</i>	-3.24	-2.55	**	-3.54	-3.96	***	-3.48	-3.89	***
<i>R&amp;D/Sales</i>	0.37	3.07	***						
<i>Accruals/Assets</i>				-0.50	-0.16				
<i>Abs. Accruals/Assets</i>							18.47	5.20	***
<i>Leverage</i>	-5.44	-3.24	***	-4.18	-3.27	***	-5.57	-4.35	***
<i>Assets(\$MM)</i>	0.000	-3.95	***	0.00	-2.34	**	0.000	-2.10	**
<b>Contract characteristics:</b>									
<i>Facility Amount (\$ MM)</i>	-0.01	-6.83	***	-0.01	-17.33	***	-0.01	-16.98	***
<i>Maturity (Months)</i>	-0.04	-1.66	*	-0.03	-2.10	**	-0.03	-1.76	**
<b>Instrumental Variables</b>									
<i>Voting Rights</i>	-2.82	-4.63	***	-3.18	-7.11	***	-3.23	-7.24	***
<i>Prepayment</i>	-0.76	-2.7	***	-0.38	-1.85	*	-0.38	-1.84	**
Number of observations	2,284			4,193			4,193		
Adjusted R <sup>2</sup>	0.13			0.12			0.13		
F-test of excluded instruments	27.90			49.35			50.69		
<i>Panel B: Dependent variable All in Drawn Spread</i>									
<b>Syndicate structure:</b>									
<i>Lead Share (%)</i>	-2.83	-3.14	***	-3.12	-4.19	***	-2.99	-4.17	***
<b>Borrower characteristics:</b>									
<i>Senior Debt Rating NIG</i>	42.82	4.81	***	36.23	5.28	***	37.88	5.71	***
<i>R&amp;D/Sales</i>	1.38	1.66	*						
<i>Accruals/Assets</i>				-80.76	-4.09	***			
<i>Abs. Accruals/Assets</i>							248.12	9.52	***
<i>Leverage</i>	66.91	5.74	***	61.31	6.78	***	49.15	5.32	***
<i>Assets(\$MM)</i>	-0.003	-4.60	***	0.00	-3.68	***	0.000	-3.36	***
<b>Contract characteristics:</b>									
<i>Facility Amount (\$ MM)</i>	-0.05	-5.44	***	-0.09	-9.38	***	-0.08	-9.36	***
<i>Maturity (Months)</i>	-0.14	-0.93		-0.14	-1.23		-0.06	-0.53	
Adjusted R <sup>2</sup>	0.12			0.12			0.13		

\*\*\* Indicates *p* value of 1%  
 \*\* Indicates *p* value of 5%  
 \* Indicates *p* value of 10%

**TABLE 7: ALTERNATIVE MEASURES OF SYNDICATE STRUCTURE**

This table presents results of first and second stage regression for syndicate structure and interest rates as defined by All in Drawn Spreads. Alternative measures of syndicate structure are concentration of the syndicate and number of participants. Regressions (2) and (4) correspond to 2SLS using predicted values from regression (1) and (4) respectively. The sample contains completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6). All in Drawn Spread describes the amount the borrower pays for each dollar drawn down. Each observation in the regression corresponds to a different deal. Borrower's and lender's characteristics are computed as of the earliest date previous to the origination of the loan. For definition of other dependent variables please see Appendix 1. Each regression included year fixed effects jointly significant at 1% level. The t-statistics are constructed using Murphy-Topel adjusted standard errors.

	<b>(1)</b>		<b>(2)</b>		<b>(3)</b>		<b>(4)</b>					
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat				
<b>Syndicate structure:</b>												
<i>Herfindahl index</i>			-0.03	-3.38	***							
<i>Number of participants</i>							27.47	4.44	***			
<b>Borrower characteristics:</b>												
<i>Senior Debt Rating NIG</i>	232.20	2.66	***	78.98	13.3	***	-0.45	-2.42	**	97.06	14.78	***
<i>Not Rated</i>	576.89	6.88	***	58.81	7.5	***	-1.30	-7.27	***	81.64	8.15	***
<i>Private</i>	45.16	0.68		25.44	5.97	***	0.21	1.7	*	18.65	4.41	***
<i>Log (Sales at close)</i>	-351.11	-18.04	***	-21.86	-5.96	***	0.82	21.89	***	-35.34	-6.86	***
<i>Previous syndicated loan</i>	-170.73	-2.87	***	-10.56	-2.52	**	0.11	0.89		-7.05	-1.78	*
<b>Contract characteristics:</b>												
<i>Facility Amount (\$ MM)</i>	-0.31	-6.34	***	-0.02	-4.23	***	0.01	46.04	***	-0.16	-4.76	***
<i>Maturity (Months)</i>	-9.88	-7.54	***	-0.83	-6.34	***	0.04	13.25	***	-1.13	-4.68	***
<i>Collateral</i>	325.59	5.77	***	76.24	18.79	***	0.07	0.59		59.54	14.92	***
<i>Financial Covenants</i>	94.84	1.2		-7.37	-1.49		0.90	5.95	***	-32.94	-4.55	***
<i>Dividends Restrictions</i>	502.52	4.6	***	199.69	22.7	***	0.01	0.06		165.53	22.43	***
<i>Prime Base rate</i>	-372.21	-5.76	***	-53.11	-9.28	***	0.07	0.48		-41.86	-9.26	***
<i>Performance Pricing (Decreasing)</i>	-301.22	-3.62	***	-42.85	-7.15	***	1.95	9.8	***	-79.70	-6.13	***
<i>Performance Pricing (Increasing)</i>	330.84	3.23	***	15.19	2.82	***	1.67	8.16	***	-33.23	-2.75	***
<i>Revolver Line &lt; 1 year</i>	-446.10	-5.47	***	-57.69	-8.62	***	1.94	11.39	***	-92.98	-7.01	***
<i>Term Loan A</i>	-42.48	-0.19		53.87	3.83	***	2.06	6.83	***	-10.79	-0.65	
<i>Term Loan B-D</i>	-193.16	-1.16		108.53	9.95	***	2.45	10.39	***	12.80	0.74	
<b>Lender characteristics:</b>												
<i>Relationship within the syndicate</i>	-4217.67	-42.66	***	-153.25	-3.57	***	4.26	29.66	***	-120.43	-4.51	***
<i>Lead bank market share</i>	-14.66	-3.59	***	-0.73	-2.45	**	0.04	5.57	***	-2.25	-6.44	***
<b>Instrumental Variables</b>												
<i>VotingRights</i>	-187.13	-4.72	***				-0.18	-2.48	**			
<i>Prepayment</i>	-51.30	-3.77	***				0.16	5.1	***			
Observations	4,782			4,782			14,619			14,619		
Adjusted R <sup>2</sup>	0.55			0.47			0.45			0.26		
F-test excluded instruments	19.94						16.47					

**TABLE 8: EVIDENCE OF ADVERSE SELECTION**

This table presents results corresponding to second stage of 2SLS regression using alternative measures of syndicate structure. The original sample containing completed dollar denominated loans originated between 1988 and 2004 to U.S. companies excluding regulated and financial industries (1-digit SIC 4 and 6) was matched to CRSP. The focus of the table is an interaction term with *High* volatility, which is an indicator of the volatility above industry portfolio. Borrower's and lender's characteristics are computed as of the earliest date previous to the origination of the loan. For definition of other dependent variables please see Appendix 1. Each regression included year fixed effects jointly significant at 1% level. The t-statistics are constructed using Murphy-Topel adjusted standard errors.

	(1)		(2)		(3)	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
<b>Syndicate structure:</b>						
<i>Lead Share (%)</i>	-1.26	-1.45				
<i>Herfindahl index</i>			-0.02	-2.3		**
<i>Number of participants</i>					30.57	3.69 ***
<b>Borrower characteristics:</b>						
<i>Senior Debt Rating NIG</i>	75.49	14.6	74.31	13.95	99.83	11.94 ***
<i>Not Rated</i>	14.44	0.94	17.14	1.03	58.69	2.03 **
<i>Not Rated* High volatility</i>	31.86	2.00	31.15	1.89	37.75	1.37
<i>High volatility</i>	2.72	0.27	3.35	0.31	-14.51	-0.78
<i>Log(Sales at close)</i>	-14.47	-4.73	-17.26	-5.25	-40.35	-4.97 ***
<b>Contract characteristics:</b>						
<i>Facility Amount (\$ MM)</i>	-0.01	-2.07	-0.01	-2.62	-0.16	-3.84 ***
<i>Maturity (Months)</i>	-0.71	-5.93	-0.73	-6.47	-1.46	-4.72 ***
<i>Collateral</i>	68.62	20.78	71.16	19.95	54.64	8.86 ***
<i>Financial Covenants</i>	-3.37	-0.72	-3.38	-0.68	-42.87	-3.69 ***
<i>Dividends Restrictions</i>	13.36	2.53	13.92	2.54	-36.60	-2.15 **
<i>Prime Base rate</i>	196.68	25.49	200.82	22.96	170.57	15.55 ***
<i>Performance Pricing (Decreasing)</i>	-34.70	-8.07	-39.27	-7.94	-34.04	-5.38 ***
<i>Performance Pricing (Increasing)</i>	-30.26	-5.9	-32.86	-6.25	-75.63	-4.97 ***
<i>Revolver Line &lt; 1 year</i>	-50.25	-7.36	-51.53	-8.45	-102.09	-5.54 ***
<i>Term Loan A</i>	40.97	2.59	40.14	2.53	-36.32	-1.16
<i>Term Loan B-D</i>	119.65	11.06	115.59	9.81	0.04	0
<b>Lender's characteristics:</b>						
<i>Relationship within the syndicate</i>	-66.67	-1.65	-93.21	-2.56	-132.69	-3.73 ***
<i>Lead bank market share</i>	0.07	0.29	-0.01	-0.06	-1.73	-3.45 ***
Observations	3,567		3,368		8,769	
Adjusted R <sup>2</sup>	0.57		0.56		0.19	