

Informed Lending and the Structure of Loan Syndicates – Evidence from the European Syndicated Loan Market

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Abstract

We show that information asymmetry has a first order impact on the structure of loan syndicates in a sample of UK syndicated loan contracts for the time period 1996 through 2005. Based on a theoretical model, we employ detailed borrower data for public and private companies and show that a lack of transparency induces a mandated arranger to retain a larger loan share and form smaller syndicates. Reputation even increases this share for private borrowers suggesting firm-bank specific relationships as motivation. Borrower transparency is significantly improved by credit ratings and stock exchange listings. However, a credit rating is the most prominent coordinating mechanism.

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1. Introduction

The syndicated loan market is the biggest market of global corporate finance, exceeding the annual issuance volumes of equity and bond markets altogether (Weidner, 2000). Despite the importance of this market, its mechanics are not well understood and remain largely unexplored in the literature. Research about the relevance of syndicated loans is limited and mainly restricted to the U.S., with virtually no research facing the European market. In light of major structural differences between Europe and the U.S., the private information collected in this market, its impact on information asymmetries between lenders and borrowers, and its relationship to the structure of loan syndicates in Europe are of particular relevance.

In a syndicated loan, two or more lenders jointly provide funds to a borrowing firm. Typically, the mandated arranger negotiates the loan agreement, recruits participants and performs monitoring and enforcement responsibilities on behalf of the participant lenders (see also Dennis and Mullineaux, 2000, Panyagometh and Roberts 2002, and Lee and Mullineaux, 2004).

In this paper, we analyze how information asymmetry between borrowers and lenders affects the mandated arranger's decision to structure the syndicate. We employ a sample of 3,146 syndicated loans representing 882 different UK-based non-financial firms from 1996 through 2005. This dataset is ideally suited for studying the European syndicated loan market, because a large proportion of UK syndicated loans goes to private firms. We are the first to explore this largely neglected borrower segment, utilizing detailed financial data of private and public firms. Furthermore, we decompose how information is disseminated to investors with respect to the information providers: (1) legally mandated disclosure requirements (disclosure requirements associated with

the legal form of the borrower), (2) rating agencies and (3) stock exchange listings. Our data suggest that borrower transparency is significantly improved by both credit ratings and stock exchange listings. However, rating agencies are shown to be superior information providers. Interestingly, legally mandated disclosure requirements do not increase transparency of public vis-à-vis private firms in the syndicated loan market. This is due to the fact that private firms in this market are relatively large in terms of operating revenues, assets and number of employees and, therefore, do not qualify for reporting exemptions.

Our empirical analysis is based on a theoretical model that explores the link between informational transparency and the structure of the lending syndicate. We find that a lack of transparency induces an agency conflict between the mandated arranger and uninformed participant banks as syndication reduces the monitoring incentives of the former. We show that the optimal share retained by the mandated arranger is a function of borrower asymmetric information: opaque borrowers optimally induce the mandated arranger to retain a larger share (compared to transparent borrowers), in order to attract uninformed capital from participant banks. In other words, the mandated arranger structures the syndicate according to the required level of monitoring, which is a function of borrower asymmetric information. The mandated arranger alleviates the moral hazard problem by adjusting its retained loan share, signaling monitoring diligence to uninformed participant lenders. Our theoretical analysis is inspired by the literature on informed lending (e.g. Holmström and Tirole, 1997) and investor coordination (e.g. Boot et al., 2006). The absence of a coordinating mechanism corresponds to our notion of an opaque firm. Investors who are concerned with the borrower's actions might refuse to participate in the syndicate. In our empirical analysis,

ratings and stock exchange listings (or the lack thereof) coordinate investors and thus broaden the investor base (Boot et al., 2006).

We add to existing empirical work on syndicated loan structures in two important aspects: First, we focus on the UK syndicated loan market which accounts for 36 percent of all syndicated loans issued in Western Europe. It is structurally distinct from the U.S. market as about 60 percent of all European non-financial borrowers issuing syndicated loans are private compared to less than 30 percent in the U.S.. Second, we are the first to include detailed private company data in our analysis which allows us to explore a largely neglected borrower segment, and also to develop accurate and novel proxies for information asymmetry. Prior research primarily focused on stock exchange listed borrowers.

Exploring the impact of information asymmetry on syndicate structure in a sample of both public and private firms has an additional methodological advantage. This sample permits us to assess the ability of rating agencies to reduce information asymmetry compared to stock exchange listings. We find empirical evidence that both rating agencies and stock exchange listings have a major impact on information transparency. However, the full sample analysis presented in this paper shows that firms that are both private and rated form significantly larger and less concentrated syndicates than firms that are both stock exchange listed (public) and unrated. This suggests that rating agencies play a dominant role in reducing information asymmetries between borrowers and investors.

In contrast to prior literature, we find differing results concerning the impact of mandated arranger reputation in our sub-samples: mandated arranger's reputation significantly reduces the share of the mandated arranger only in the sub-sample of

public firms. However, we find contrary results in the sub-sample of private firms. A reputable mandated arranger holds a significantly larger portion of the loan, *ceteris paribus*.

The paper is outlined as follows. The next section describes the background of the syndicated loan market and gives an overview over the existing literature. The third section provides a model showing the link between borrower asymmetric information and syndicate structure to motivate the empirical analysis. Based on this model, we lay out the hypotheses and the analytical approach in the fourth section. The fifth section presents the data and descriptive statistics. The sixth section presents a multivariate analysis and several robustness checks to support our results. The last section concludes.

2. The Syndicated Loan Market

2.1 Background and Development of the Syndicated Loan Market

A syndicated loan is provided to a borrower jointly by a group of lenders. Typically, one bank is mandated by the borrower. Having negotiated the loan agreement with the borrower, the mandated arranger recruits participants to fund part of the loan. While there are generally many lenders involved, all claims are governed by a single loan contract and the terms are identical for all lenders. Further tasks of the mandated arranger involve coordinating the loan documentation, the loan closing and the loan repayment, and performing primarily monitoring and enforcement responsibilities.¹ In

¹ See also Dennis and Mullineaux (2000), Panyagometh and Roberts (2002) and Lee and Mullineaux (2004). In terms of an extensive description of the loan syndication process, the different roles within a syndicate and fees associated with particular duties see Esty (2001).

compensation for their services, mandated arrangers are paid fees as a percentage of the size of the loan.

Concentration risk in a bank's loan portfolio is an important motive for the decision to engage in loan syndication.² Additionally, a comparative advantage of mandated arrangers in originating and underwriting loan commitments as opposed to funding advantages of participating banks contribute to the syndication decision and the allocation of tasks within the syndicate.

Syndicated loans are floating rate debt instruments which are priced with a spread above a reference rate. They typically include restrictive covenants giving syndicate lenders considerable control over a borrower's action (Assender, 2000). Renegotiation of covenant violations and other major loan terms (such as loan amount, interest payment, maturity or collateral) require a unanimous decision of all syndicate members. Potential renegotiations suggest that relationships are of particular importance in lending syndicates which is also highlighted by Lee and Mullineaux (2004). Prior empirical evidence by Sufi (2006) shows that in addition to relationships among syndicate members, existing relationships between borrowers and participants are of particular importance. This is especially true when information asymmetries between borrowers and lenders are severe.

2.2 Empirical Research on U.S. Syndicated Loans

Simons (1993), Dennis and Mullineaux (2000) and Jones, Lang, and Nigro (2005) examine motives that influence banks to engage in loan syndications. Key results confirm that the higher the mandated arranger's capital the larger its loan share

² See e.g. Simons (1993) and Dennis and Mullineaux (2000).

suggesting that capital constraints provide an important incentive for banks to engage in loan syndications. Dennis and Mullineaux (2000) find that a loan is more likely to be syndicated as information about the borrower becomes more transparent. They are the first who systematically analyze factors that determine both the decision whether to syndicate a loan and the percentage of a loan being syndicated. They find evidence that the better the quality of information about the borrower, the larger is the share of the loan that can be syndicated by the mandated arranger. If a borrower is informational opaque, monitoring skills of investors as well as mandated arranger reputation are positively correlated with the share syndicated to investors.

Francois and Missonier-Piera (2005) find that multiple co-agents arise in loan syndication due to the fact that banks specialize in performing administrative tasks. However, they suggest that informational effects are not predominant in the agency structure of loan syndicates, confirming results by Panygometh and Roberts (2002), who also find that adverse selection problems in particular do not prevail in loan syndications.

Closest to our own work are the papers by Lee and Mullineaux (2004) and Sufi (2006). Analyzing the structure of a syndicate, Lee and Mullineaux (2004) find that small and more concentrated syndicates should be formed when a borrower bears high credit risk since less complex syndicates improve the prospects to restructure the loan in the event of financial distress. Furthermore, small syndicates minimize adverse selection problems and enhance incentives to monitor the borrower and the lead agent respectively. In other words, they find evidence for the impact of information problems on the structure of loan syndicates.

Sufi (2006) examines a sample of syndicated loans to demonstrate how asymmetric information between lenders and borrowers affect financing arrangements in the syndicated loan market. He finds evidence that asymmetric information affects the structure of syndicated loans and the composition of syndicates in a manner consistent with moral hazard. Sufi's (2006) results show that borrowers with little or no reputation obtain syndicated loans which are similar to sole lender bank loans where the mandated arranger retains a larger share of the loan and composes a more concentrated syndicate. On the other hand, borrowers with more reputation (i.e. borrower is more known and has frequently accessed the market successfully) are able to obtain syndicated loans similar to public debt, where the mandated arranger retains a smaller share of the syndicate and forms a more diffuse syndicate. Sufi (2006) finds evidence that reputation can reduce, but cannot eliminate, problems of information asymmetry. Our own analysis differs from theirs in that we particularly focus on what constitutes “informed lending” which can only rigorously be done comparing public and private firms and decomposing how information is disseminated to investors.

3. Modeling the Syndicate

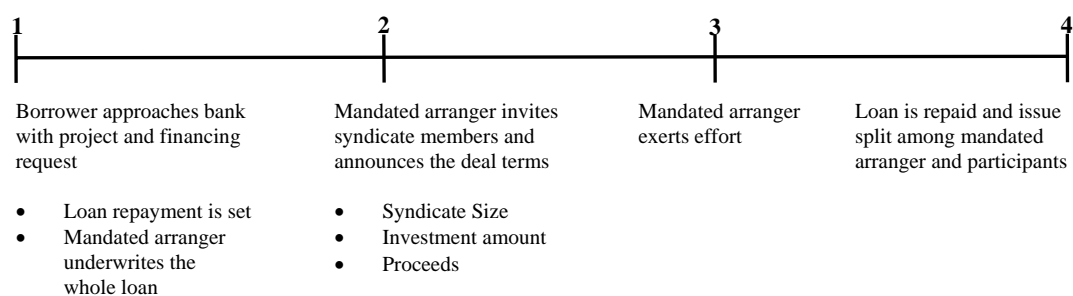


Figure 1 shows the timeline of the model. A borrower is endowed with a project and approaches a bank with a financing request. In the (not modelled) negotiation stage

between borrower and bank, the loan terms are determined, i.e. the loan repayment Y is set and cannot be changed in a later stage. If the bank accepts the loan contract, it is assumed to underwrite the whole loan amount and becomes the mandated arranger. In this simple setup, syndication by the mandated arranger is motivated through his attempt to diversify his loan portfolio or avoid frictional costs (e.g. due to capital requirements or problems accessing the capital market) following Simons (1993) and Jones, Lang and Nigro (2005).

The mandated arranger approaches potential syndicate members and offers them to participate in the syndicate. The offer includes the loan amount (i.e. the participating amount of the syndicate member) and the share of the loan repayment paid to the participants in the case the loan is successfully repaid. The offer can either be accepted or rejected; if it is accepted, the "potential syndicate members" become participants in the syndicate.

Assumptions of the Model

We employ several assumptions which require explanations. First, we are interested in the share of the loan the mandated arranger has to retain at origination of the syndicate given the information set of the lenders at this stage. The other portion of the loan is syndicated to a group (the participants), i.e. we adopt an aggregate view in terms of the participants.³

Further, we assume that the participants delegate the monitoring role to the mandated arranger. Third, we assume that no other contractual arrangements are possible. This alludes to two important issues: We are not interested in an optimal contract from an

³ We are more explicit about the structure of the participant group in the empirical part of the paper. Here, the aggregate approach is sufficient to illustrate our main result.

optimal contracting perspective. We rather take the loan contract between the borrower and the mandated arranger as given and analyze the optimal syndicate structure under this contract. Additionally, we exclude contractual arrangements that can occur after the origination stage has been closed, e.g. loan sales or other arrangements reducing the share of the mandated arranger.

The ex-ante information set of the lenders is described by the ex-ante available information about the borrower, which we call α in our model. α measures the transparency of the borrower in the sense of Diamond (1991). Diamond (1991) refers to long-lived information (e.g. a track record of repaid loans) about a borrower as reputation. The more information is available about a borrower, the higher is its reputation. Diamond (1991) shows the existence of a "life-cycle" of loans: New borrowers who lack a track record build their reputation by being monitored. In this case, monitoring provides incentives to behave. Firms with reputation can receive unmonitored finance. Lenders can predict future actions because of the borrower's track record and reputation can provide borrowers with incentives to behave.

The Model

The loan is repaid with probability p . If the borrower is not monitored, investors can only make their investment decision based on the available information about the firm, i.e. α .

$$p(\alpha) := \alpha \tag{1.1}$$

α has the support $[0;1]$. Reputable borrowers are assigned a higher probability of loan repayment because defaulting on their loans causes them a loss in valuable reputation. Less reputable borrowers do not have much reputation at risk and lenders cannot predict future actions as good as when facing a reputable borrower. Therefore, the former are assigned a lower probability of loan repayment. Without monitoring, all investors stay uninformed in the sense that they do not gain additional information about the borrower except what is publicly available.

If monitoring m is exerted by the mandated arranger, investors assign a higher probability to the repayment of the loan.

$$p(\alpha, m) := \alpha + m$$

with $\alpha + m \leq 1$. Formalizing the impact of monitoring this way, we implicitly assume that monitoring is more valuable if borrowers are less transparent. Monitoring can only be exerted by the mandated arranger and is associated with a private cost of $c(m) = \frac{1}{2}m^2$. Monitoring effort is unobservable and constitutes an incentive problem between mandated arranger and participant banks. Since participants receive a share of the return from the loan repayment, mandated arrangers have less than efficient incentives to exert monitoring effort. We formalize this problem as follows.

Let s be the share of the loan repayment syndicated to participant banks. Denote the required rate of return of the mandated arranger as r_m and the required rate of return of the participants as r_f , which is the risk-free interest rate. I_m and I_u are the investments of the mandated arranger and participants, respectively. As explained above, we assume $r_m > r_f$.

In order to find the optimal share of the loan syndicated to participants, the mandated arranger solves the following program:

$$\begin{aligned} \max_{s,m} \quad & (1-s)(\alpha+m)Y - \frac{1}{2}m^2 - I_m r_m \\ \text{s.t.} \quad & s(\alpha+m)Y \geq (I - I_m)r_f \end{aligned} \tag{1.2}$$

$$\text{s.t. } m \in \arg \max_{\hat{m}} (1-s)(\alpha+\hat{m})Y - \frac{1}{2}\hat{m}^2 - I_m r_m \tag{1.3}$$

$$\begin{aligned} \text{s.t. } \quad & \alpha + m \leq 1 \\ \text{s.t. } \quad & s \leq 1 \end{aligned} \tag{1.4}$$

where (1.2) is the participation constraint of the participant banks. Due to competition, participants receive their reservation utility and (1.2) is binding in the optimal solution. (1.3) is the incentive compatibility constraint of the agent. He chooses his unobservable monitoring level as to maximize his payoff from the loan. (1.4) constraints the probability of successful loan repayment to equal or below 1.

In order to find an analytical tractible solution, we assume that the Convexity of the Distribution Function Condition (CDFC) and Maximum Likelihood Ratio Property (MLRP) are satisfied by assumption. We simplify the program using the first order approach put forth by Hart and Holmström (1987). The first order condition of the incentive compatibility constraint of the agent is given by

$$(1-s)Y = m \tag{1.5}$$

The optimal monitoring level has to fulfill this constraint. It can readily be seen that the optimal monitoring level is lower than in the first best, i.e. $Y = m$.

The Lagrangian reads as follows

$$\begin{aligned}
L = & (1-s)(\alpha+m)Y - \frac{1}{2}m^2 \\
& -r_m \left[I - \frac{(\alpha+m)sY}{r_f} \right] \\
& + \mu [(1-s)Y - m] \\
& + \lambda (\alpha + m - 1) \\
& + \gamma (s - 1)
\end{aligned}$$

Maximizing L w.r.t. m and s yields the first order conditions

$$\frac{\partial L}{\partial m} = (1-s)Y - m + \frac{r_m}{r_f} \frac{1}{2} sY - \mu + \lambda = 0 \quad (1.6)$$

$$\frac{\partial L}{\partial s} = -(\alpha+m)Y + \frac{r_m}{r_f} (\alpha+m)Y \quad (1.7)$$

$$-\mu Y + \gamma = 0$$

From (1.7) follows

$$\mu = (\alpha+m) \left(\frac{r_m}{r_f} - 1 \right) + \frac{\gamma}{Y} \quad (1.8)$$

Using (1.8) with (1.6) and inserting the optimal monitoring level from (1.5) yields after rearranging:

$$s^* = \frac{1}{2} \left(1 - \frac{r_f}{r_m} \right) \left(\frac{\alpha}{Y} + 1 \right) + \frac{1}{2} \frac{r_f}{r_m} \frac{\gamma - Y\lambda}{Y^2}$$

Taking the first derivative with respect to α , one can verify that the optimal share syndicated to participants is increasing in α , i.e. the less transparent the borrower, the higher the stake the lead arranger has to retain in the firm (in the proceeds of the loan) in order to be a credible monitor.

4. Hypotheses and Analytical Approach

The Structure of the Syndicate

The preceding section shows a simple model that allows predictions about the way informed and uninformed investors participate in the syndicated loan market using a principal-agent framework. The observation that in a setting with informed lender moral hazard, the monitor can be given incentives by having a larger stake in the firm has e.g. been studied in the corporate control literature in the spirit of Holmström and Tirole (1997). If information asymmetries between borrowers and lenders are high, the borrower requires more intensive monitoring from an informed lender. This in turn induces an incentive problem between informed and uninformed lenders. The latter will only participate, if the informed party has a sufficiently high share to diligently monitor the borrower.

A similar implication can be found in the early loan sales literature. Pennacchi (1988) and Gorton and Pennacchi (1995) show that giving the bank a disproportionate share of the gains from monitoring enables a greater amount of the loan to be sold while maintaining monitoring efficiency. An illustration of this mechanism is securitization, e.g. of credit card receivables. Giving the bank an equity position provides the bank with monitoring incentives and enables senior tranches to be sold to participants.

Our analysis of syndicated loan originations suggests an important difference to loan sales contracts: while the incentive effect in the latter case is achieved by issuing securities with different levels of seniority and having the monitor retaining the equity tranche, this is not possible in loan syndications. In order to maintain efficient

monitoring incentives, the mandated arranger has to adjust its loan share accordingly. The first hypothesis follows directly.

H1: The more informational opaque the borrower, the higher the share the mandated arranger retains in the syndicated loan.

A concentration measure captures how much of the loan is held by a few lenders. We account for the fact that mandated arrangers might themselves delegate part of their monitoring duty to co-agents. A similar effect has been observed by Francois and Missionier-Piera (2005): delegating monitoring to co-agents can mitigate the moral hazard problem. However, the co-agent himself is subject to moral hazard. Following the literature on moral hazard in team production (see e.g. Holmström, 1982, Pichler and Wilhelm, 2001), costs associated with free riding in monitoring are more pronounced if information asymmetries between borrowers and lenders are severe.

H2: If the borrower is opaque, we expect that monitoring duties are allocated to very few lenders and, therefore, syndicates are more concentrated.

How does the size of the syndicate relate to problems of information asymmetry? We adopt an aggregate view in terms of the participant members in the syndicate to develop a hypothesis about the share of the loan retained by the mandated arranger. In reality, participants are heterogeneous and have heterogeneous beliefs about the actions taken by the borrower. As shown by Boot et al. (2006), beliefs and actions depend on the presence of a coordinating mechanism which is a credit rating in their model. A credit rating "...has value because some investors choose to take the announced rating seriously. In doing so, they affect the funding costs and consequently the behavior of the firm, which confirms the rating." The absence of a coordinating mechanism

corresponds to our notion of an opaque firm. Investors who are concerned with the borrower's actions might refuse to participate in the syndicate.

H3: If the borrower is opaque, the number of lenders in the syndicate declines.

Decomposing Information Dissemination

In this section we present novel measures for information asymmetry which provide interesting insights with regard to the question how information is disseminated to investors in the loan market. We then refine our hypotheses with respect to these measures.

The first measure of information asymmetry is the legal form of the borrower. A firm can either be private or public. In turn, if it is public, it can either be stock exchange listed (i.e. the equity is traded) or not stock exchange listed. A second measure is a senior unsecured credit rating by S&P, Moody's or Fitch. Therefore, we employ six dummy variables for (1) *private and unrated*, (2) *private and rated*, (3) *public, not stock exchange listed and unrated*, (4) *public, not stock exchange listed and rated*, (5) *public, stock exchange listed and unrated*, and (6) *public, stock exchange listed and rated firms*.

How can we differentiate between these groups in terms of transparency? In other words, which group proxies for opaque and transparent firms, respectively? We expect the following relationships: First, public firms are more transparent than private firms. Dependent on asset size, operating revenues and number of employees, private firms can be exempted from disclosure requirements. A public firm is not eligible for disclosure exemptions. Meeting the disclosure requirements increases publicly available information about a firm and reduces information asymmetry. Therefore, we expect public firms to form larger and less concentrated syndicates than private firms. Second,

rated borrowers are more transparent than unrated borrowers due to third party certification. The same argument applies to not stock exchange listed vis-à-vis stock exchange listed companies. A company whose equity is publicly traded is subject to scrutiny and increased analyst coverage which reduces information asymmetry. We summarize our expectations in the following predictions:

P1. Public, stock exchange listed and rated firms are the most transparent firms in our sample. We expect to find the largest and least concentrated syndicates associated with these borrowers. Mandated arrangers are supposed to hold smaller shares.

P2. Private and unrated firms are the most opaque firms in our sample. Therefore, they should form the smallest and most concentrated syndicates. Mandated arrangers are supposed to retain larger shares.

These predictions essentially refine our first two hypotheses. All syndicates associated with loans to borrowers that are not assigned to the group of the most transparent firms should be significantly smaller and more concentrated, and mandated arrangers are supposed to retain larger shares. But what information is actually informative for investors and increases transparency?

P3. Private and unrated firms form smaller and more concentrated syndicates than public, not stock exchange listed and unrated firms.

P4. Stock exchange listed firms form larger and less concentrated syndicates than public, not stock exchange listed firms given that both groups are either unrated or rated.

However, we have to be cautious. Obviously, we cannot make meaningful predictions comparing the group of private and rated firms to the group of public, not

stock exchange listed and unrated firms ex-ante: a borrower that changes its legal status from private to public is supposed to become more transparent. However, losing its rating has a countervailing effect: the borrower becomes more opaque. The overall effect is ambiguous. A similar argument applies to public, not stock exchange listed and rated firms vis-à-vis public, stock exchange listed and unrated firms.

Regression Model Development

The general form of our regression models examining the link between borrower information asymmetry and syndicate size (as reflected by number of lenders) as well as concentration (reflected by mandated arranger share or HHI⁴) is:

$$\text{Syndicate Size} = f(\text{Information Variables}, \text{Control Variables})$$

$$\text{Concentration} = f(\text{Information Variables}, \text{Control Variables})$$

The key right hand side variables are the proxies for *borrower information asymmetry* as explained above.

Consistent with prior studies, we include several control variables to rule out other possible explanations for syndicate structures, such as differences in credit risk, mandated arranger reputation, firm and loan characteristics. Other potential control variables related to information asymmetry and opacity are included in our robustness checks. We relay a detailed description of the variables used to Table 1 and provide only a sketch of the most prominent controls in this section.

We control for borrower credit risk since previous literature has highlighted its role in structuring the lending group (e.g. Bolton and Scharfstein, 1996, Lee and Mullineaux,

⁴ The Herfindahl-Hirschman index (HHI) is a concentration measure, taking each lender's absolute percentage loan share, squares it, and then sums the squared shares. Its value varies from 0 to 10,000.

2004). To avoid hold-out behavior of syndicate members or coordination problems in renegotiations, the mandated arranger should keep a larger share of the loan. However, if a “strategic default” is more likely, the mandated arranger should augment the lender group to harden the borrower's budget constraint. Furthermore, participating banks might be concerned with concentration risks and therefore only willing to take a smaller share of the loan. In this case, a higher probability of default implies a larger and more diffuse syndicate. Therefore, we cannot predict a clear sign for the credit risk variables used in our empirical regressions (particularly *leverage* and *income to assets*).

We follow arguments by Gorton and Haubrich (1990) that reputation substitutes for the share of the loan the mandated arranger has to retain in order to be a credible monitor, in our analysis. We proxy for reputation using *repeated transactions* between mandated arrangers and participants as well as the *market share* of the mandated arranger in a given year (see also Dennis and Mullineaux, 2000) . We expect syndicates to be larger and less concentrated for more reputable mandated arrangers.

We control for a variety of loan characteristics, particularly *loan size*, *maturity* and *loan type* (e.g. term loan indicator). Furthermore, *loan purpose* dummies are included in each regression model as well as *industry* and *year* dummies.

5. Data & Descriptive Statistics

Data

We create the universe of our sample by merging loan transaction data using Reuters/Loan Pricing Corporation (LPC) Dealscan database with borrowing firm financial statement data from UK's Companies House. Dealscan is the primary database used to evaluate syndicated loans, containing detailed information on worldwide

syndicated loan originations i.e. contract terms, lender identities and roles within the syndicate, as well as borrower identity (i.e. name, region, country, and SIC industry classification)⁵. However, apart from U.S. firms, Dealscan virtually provides no borrower financials. According to our analysis about 61% of all UK firms (and 60-70% of all European firms respectively) issuing syndicated loans are private pointing out a major structural difference compared to the U.S.. In the U.S. more than 70% of all borrowers issuing syndicated loans are public enabling researchers to use S&P's Compustat database to get an even richer set of financials regarding stock exchange listed U.S. firms (respective studies suppress an in-depth analysis of private and not stock exchange listed U.S. issuers). To gather a rich set of financial variables regarding both private and public sample borrowers, we match our loan data with data from UK's Companies House. Companies House is the national institution responsible for storing all company information provided under the UK's Companies Act. Information provided includes all companies' filings, companies' industry affiliation, legal form as well as date of incorporation. We manually match the Dealscan sample borrowers with Companies House and require a matching on all of the following three criteria: name, industry affiliation given by SIC codes and region⁶. We use the financial data of the year prior to the loan transaction.

For UK-based borrowers, Dealscan contains information on 5,063 syndicated loans issued between 1996 and 2005 involving 1,481 different firms and 1,176 different

⁵ Carey, Post and Sharpe (1998) provide detailed information about LPC Dealscan database.

⁶We carefully account for changes in legal status, changes in name as well as merger and acquisition activities among our sample borrowers. Employed databases include Thomson Financial SDC Platinum, Mergermarket and Bloomberg Corporate action calendar.

lenders⁷. We drop loans that are "not fully confirmed" (112), loans to borrowers of regulated and financial industries (617), as well as loans with structural inconsistencies (10). We obtain 4,324 syndicated loan facilities representing 1,228 different borrowers and 1,013 different lenders from 1996 through 2005. Connecting our Dealscan sample with Companies House data allows borrower classification according to legal form i.e. private vs. public. Furthermore, we employ Dun & Bradstreet's Hoovers database to obtain information whether a public firm is stock exchange listed and on which stock exchanges it is listed.

The matching process results in a final sample with detailed financial data for 3,146 syndicated loan facilities representing 882 different UK-based firms from 1996 through 2005. Of these firms, we recognize 61% as private and 39% as public firms respectively.

Descriptive Statistics

Table 2 provides cell means and standard errors in parentheses, grouped by measures of information asymmetry, for our final sample. Descriptive statistics of borrower characteristics (Panel A) are calculated at the firm level i.e. we compute averages across all loan facilities by a given firm, whereas Panel B presents issue and

⁷ The basic unit of observation in Dealscan is a facility ("loan"). If firms enter into multiple facilities at the same time, different facilities are syndicated into one deal. As syndicate structure and size as well as contract terms (e.g. maturity, loan amount, spread) and facility types (e.g. term loan or revolver line) differ across facilities in one deal, we perform a facility level analysis. However, all basic results are robust to both an analysis that only considers the largest and earliest facility and a deal-level analysis that aggregates number of lenders, loan shares and loan amounts held across all facility types in one deal.

syndicate structure characteristics calculated at the individual facility level. Table 1 provides a description of variables.

[Table 2]

61% of sample loan facilities go to private and 39% to public firms respectively. Further classification of firms regarding publicly available information reveals that 53% of sample loan facilities go to opaque borrowers (not rated privates), whereas, only 9% belong to transparent firms (stock exchange listed and rated). Panel A demonstrates that on average, publics are bigger in size and have higher operating revenue compared to privates. The same is true for rated firms vis-à-vis not rated firms, both in public and private sub-samples. Grouping borrower industry sectors according to first digit SIC-Code reveals that manufacturing (2,3), transportation et al. (4) and services (7,8) are most represented. The interest coverage ratio of opaque borrowers is 24.04, whereas transparent firms have an average ratio of 2.75. In line with this observation, Panel B presents that 53% of opaque borrowers issue syndicated loans because of corporate control (LBO/MBO activities), whereas for transparent firms most issuances are due to capital structure purposes (42%). Panel B presents that loans to transparent borrowers are on average larger, have shorter maturities and lower spreads. On the other hand, opaque firms show an average loan size of USD 168 million and an average maturity almost twice as long as of transparent firms. Furthermore, opaque firms borrow at 238 bps, whereas transparent firms at 107 bps above LIBOR on average. We omit to comment on collateral as for 96% of sample loans secured status is unknown.

Analyzing syndicate structure across information measures reveals that the number of total lenders is more than three times as high in the case of transparent firms than in

the case of opaque firms, which is also confirmed in the total number of lead banks (14.19 vs. 3.23) as well as the total number of participant banks (5.82 vs. 2.81)⁸. On average, a facility of a rated firm has twice as much lenders than of an unrated borrower. A lead bank holds 31.04% share of the loan when the borrowing firm is opaque which is more than twice the share compared to a rated private borrower and almost four times the share compared to a transparent firm. Interestingly, comparing unrated privates with not traded unrated publics reveals that borrowers in both groups exhibit almost identical syndicate structures. We conclude that perceived opacity by investors and thus required level of monitoring is similar across both groups, reflected in the share retained by the mandated arranger as well as in the HHI⁹. Indeed, private unrated sample firms are large in firm size and therefore are subject to disclosure requirements, which are almost identical to those of not traded publics. The objection that syndicate structures are primarily driven by firm size is invalidated by the fact that publics are significantly larger. Interestingly, rated privates form significantly larger and less concentrated syndicates than unrated traded firms suggesting that credit ratings as a coordinating mechanism plays a dominant role in reducing information asymmetries between borrowers and investors.

⁸ Lead banks primarily perform management tasks with the mandated arranger being the most prominent lead bank; participant banks solely provide funds. Lender classification / roles is available upon request.

⁹ The Herfindahl-Hirschman index (HHI) is a concentration measure, taking each lender's absolute percentage loan share, squares it, and then sums the squared shares. Its value varies from 0 to 10,000.

6. Multivariate Analysis

Model Estimation

Table 3 presents syndicate size models. Estimates alternate regarding lead arranger market share and repeated transactions. Transparent firms are the omitted group.

[Table 3]

The top five rows show that borrower opacity significantly affects syndicate size in a manner consistent with the theoretical foundation. Columns (1), (3), (5) and (7) show that unrated privates have 28% fewer total lenders, 36% fewer lead banks, 22% fewer participant banks and 31% fewer mandated arrangers than transparent firms. Further, consistent with the descriptive statistics, not traded unrated publics show similar opacity coefficient estimates to unrated privates. As more borrower information becomes publicly available either by a senior unsecured debt rating or by a stock exchange listing, the estimation coefficients show significant wider syndicates. Coefficient estimates of the leverage ratio are positive and partially significant. However, in subsequent regression models they are never significant. Thus, we conclude that syndicate structure is not systematically related to credit risk, possibly alluding to the fact that default rates are low in the syndicated loan market (see e.g. Altman and Suggit, 2000). Contrasting with prior literature on the U.S. market, coefficients of market share and repeated transactions indicate that reputable lead banks form smaller syndicates. A rationale might be that reputable lenders want to establish and maintain "relationships" with private sample borrowers.

[Table 4]

Table 4 presents estimates linking information proxies to mandated arranger share (Panel A: Exposure Models) and to Herfindahl-Hirschman index (Panel B: Concentration Models) respectively. Full sample regressions include all firms, whereas private sample (public sample) only private (public) firms. Number of observations change with joint availability of Companies House and mandated arranger share / Herfindahl data.

The first three rows of panel A present negative and significant estimates of information dummies. Full sample estimates reveal that the mandated arranger retains 6 percent less of the loan if the borrower has a debt rating and 2 percent less, if firm equity is traded. Thus, both rating agencies and stock exchanges perform a significant role in mitigating information asymmetries; however, rating agencies are superior to stock exchanges. Private sub-sample results confirm the significant role of third party rating agencies in mitigating information asymmetries, convincing uninformed lenders to provide funds. Also, public sub-sample estimates show that ratings and analyst coverage increase information availability, facilitating firm investigation, and thus decreasing the level of required monitoring. Ultimately, the mandated arranger holds a smaller proportional loan share. Furthermore, private and public sub-sample estimates reveal interesting insights regarding the effect of lead bank reputation in the European syndicated loan market: in line with the size models, the private sub-sample presents evidence that market share is highly significant and positive, implying that reputable mandated arrangers retain more of a loan. However, if firms are public, reputation lowers the loan share retained by the mandated arranger, *ceteris paribus*. This finding is in line with U.S. research on syndicated loans arguing that uninformed investors rely on reputation, allowing reputable mandated arrangers to syndicate out a larger fraction of

the loan. In the case of private borrowers, reputable lenders might utilize their reputation to form valuable "house bank" relationships retaining larger loan shares and/or to warehouse the loan.

Panel B presents evidence both in line with our theory, syndicate size and exposure models. Syndicates become less concentrated as borrower transparency improves by third party ratings, stock exchange listings, or both, as agency costs associated with free riding in monitoring are less pronounced. Coefficients on reputation are similar to the exposure models, however, not statistically distinct from 0 at a meaningful level of confidence.

Robustness Tests

We control for residual concerns that syndicate structure might be primarily driven by firm size effects, employing controls for the natural logarithm of borrower's operating revenue as well as three controls on the natural logarithm of facility amount in all regression equations. Thus, we filter out the firm size effect and our estimates on the information dummies should adequately proxy for information asymmetry. In order to resolve any residual "size" concerns, Table 5 tests alternative measures of information asymmetry that are presumably less correlated with firm size.

[Table 5]

Table 5 presents estimates linking alternative proxies of information asymmetry to Herfindahl-Hirschman index and to mandated arranger share both for private firms (Panel A) and public firms (Panel B) separately. Number of observations change with

joint availability of Companies House and mandated arranger share / Herfindahl data across private and public firms respectively.

Panel A presents evidence that borrower uniqueness as measured by the fraction of other firms in the same industry¹⁰ is highly significant and negative both in the HHI and % held by the mandated arranger equations. Coefficients on years since date of incorporation are counterintuitive. We would have expected that firm age and borrower opacity are negatively correlated. We construct current ratio and EBIT to sales as alternative credit risk proxies and find a weak relationship between syndicate structure and borrower credit risk.

Panel B shows that alternative measures of information asymmetry as proxied by industry uniqueness, years since date of incorporation, several exchange listings as well as market to book ratio affect syndicate structures among public firms.

In unreported results we completely exclude all loan characteristics, in order to address residual concerns that syndicate structure and loan characteristics are jointly determined. If this would be true, the coefficient estimates on our information proxies might be biased. However, using this "exclusion approach", we get coefficient estimates that are qualitative similar to the results presented.

¹⁰ Faulkender and Petersen (2006) find that firms in industries known to bankers have less difficulties in issuing bonds. Having comparable firms therefore contributes to the transparency of the firm.

7. Conclusion

This paper analyzes the impact of information asymmetry on the structure of loan syndicates employing a unique dataset of UK borrowers for the time period 1996-2005. In line with our theoretical model, the empirical findings demonstrate that mandated arrangers hold a larger share of the loan and form more concentrated syndicates if information asymmetries between borrowers and lenders are more pronounced. One important result is that legally mandated disclosure requirements do per se not increase transparency of public vis-à-vis private firms. However, borrower information availability is effectively increased by a coordination mechanism, i.e. rating agencies and stock exchange listings. Stock exchange listings increase the transparency of the borrower, but the overall effect is well below that of rating agencies.

Prior literature accentuated the reputation effect of the mandated arranger. We find differentiated results in our dataset: the sub-sample of public firms reveals supportive results for the hypothesis that the mandated arranger's reputation substitutes for the share of the loan it has to retain in order to be a credible monitor. However, we find contrary results in the sub-sample of private firms. A reputable mandated arranger holds a significantly higher portion of the loan. Possible explanations are that the mandated arranger uses its reputation to build and maintain relationships with private borrowers. Alternatively, it has comparative advantages e.g. in warehousing the loan. This finding provides an interesting avenue for future research.

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Table 1
Description of Variables

Variables	Descriptions
<i>1. Information Variables</i>	
Priv. Firm	Dummy variable equal to 1 if the borrower's legal status is private.
Priv. / Not Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is private and if the borrower has no senior unsecured debt rating.
Priv. / Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is private and if the borrower has a senior unsecured debt rating.
Publ. Firm	Dummy variable equal to 1 if the borrower's legal status is public.
Publ. / Not S.E.L. / Not Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is public, if the borrower's equity is not listed on an exchange and if the borrower has no senior unsecured debt rating.
Publ. / Not S.E.L. / Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is public, if the borrower's equity is not listed on an exchange and if the borrower has a senior unsecured debt rating.
Publ. / S.E.L. / Not Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is public, if the borrower's equity is listed on an exchange and if the borrower has no senior unsecured debt rating.
Publ. / S.E.L. / Rat. Firm	Dummy variable equal to 1 if the borrower's legal status is public, if the borrower's equity is listed on an exchange and if the borrower has a senior unsecured debt rating.
Rating	Dummy variable equal to 1 if the borrower has a senior unsecured debt rating.
Stock Exchange Listing	Dummy variable equal to 1 if the borrower's equity is listed on an exchange.
<i>2. Information Variables - Alternative Proxies</i>	
Total Assets	Borrower's total assets at the end of the year prior to the syndication arrangement.
Ln(Operating Revenue)	Natural logarithm of the borrower's operating revenue / turnover at the end of the year prior to the syndication arrangement.
EBITDA (in \$m)	Borrower's earnings before interest, tax, depreciation and amortization at the end of the year prior to the syndication arrangement.
Number of Employees	Total number of employees of the borrower at the end of the year prior to the syndication arrangement.
Ln(1+years since incorporation)	Natural logarithm of one plus the number of years since the company has been incorporated at the end of the year prior to the syndication arrangement.
Ln(1+years since IPO)	Natural logarithm of one plus the number of years since the company has gone public at the end of the year prior to the syndication arrangement.
Ln(1+fraction of other firms in industry)	Natural logarithm of one plus the fraction of firms which operate in the same industry. => <i>Calculation:</i> 1) Count the number of firms where the first two digits of the SIC-Code are identical to those of the borrower concerned. 2) Exclude the borrower concerned. 3) Divide this number by the total number of borrowers in the sample.
Firms with several Exchange Listings	Dummy variable equal to 1 if the borrower's equity is trading on more than 1 exchange.
Tangibles to Assets	Ratio of Tangible Assets to Total Assets at the end of the year prior to the syndication arrangement. => <i>Calculation:</i> Tangible Assets / Total Assets
Accruals to Assets	Ratio of positive accruals to total assets of the borrower at the end of the year prior to the syndication arrangement. => <i>Calculation:</i> $[(\Delta \text{Current Assets} - \Delta \text{Cash \& ST Investments}) - (\Delta \text{Current Liabilities} - \Delta \text{Debt in Current Liabilities} - \Delta \text{Income Taxes} - \text{Depr. \& Amortization})]$.
Market to Book	Measures the growth options of the borrower at the end of the year prior to the syndication arrangement. => <i>Calculation:</i> $(\text{Total Assets} - \text{Book Value of Equity} + \text{Market Value of Equity}) / \text{Total Assets}$
<i>3. Reputation Variables (Control Variables)</i>	
Market share	Market share of the lead bank in the year of the syndication arrangement. Market share is constructed using origination volumes during the syndication year.
Repeat	Number of repeated transactions between the lead bank and other syndicate members until the year of the syndication arrangement. => <i>Calculation:</i> 1) Identify all institutions that acted as lead bank at least twice. 2) For each lead bank, list all participants in the deal. 3) For each participant on the client list, count the number of deals arranged by the given lead institution in which the bank participated. 4) Sum the numbers from step 3 across participant banks on the client list, and then subtract the number of banks on the client list to get the value of "Repeat" for the given lead bank. We subtract the number of banks on the client list because the first instance of participation by any bank does not represent repeat business, but rather establishes the relationship. This measure is also used by Lee and Mullineaux (2004).

Table 1
Description of Variables (continued)

Variables	Descriptions
<i>4. Credit Risk / Profitability Variables (Control Variables)</i>	
Working Capital to Total Assets	Part of Z-Score; focuses on liquidity analysis of the borrower as current assets and current liabilities typically have maturities of less than one year. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: (Current Assets - Current Liabilities) / Total Assets
EBIT to Total Assets	Part of Z-Score; return on assets. It measures a borrower's ability and efficiency in using its assets to generate operating profits. Further, it reports the total return accruing to all providers of capital (debt and equity), independent of the source of capital. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: EBIT / Total Assets
MV Equity to BV Liabilities	Part of Z-Score; measures whether the market perception of the borrower's earning power would permit the borrower to raise additional debt. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: Market Value of Equity / Total Debt
Operating Revenue to Total Assets	Part of Z-Score; "Total Asset Turnover" i.e. relates operating revenue to total assets. This relationship provides a measure of overall investment efficiency by aggregating the joint impact of both short- and long-term assets. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: Operating Revenue (sales + stock variations + other operating revenues) / Total Assets
Leverage Ratio	Solvency stock measure that indicates whether the borrower is able to meet its obligations in the distant future. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: Total Debt / Total Assets
Income to Assets	Return on assets. It measures a borrower's ability and efficiency in using its assets to generate income. => Calculation: Net Income (excluding extraordinary items) / Total Assets
Interest Coverage Ratio	Solvency flow measure. Measures how many times interest expenses are covered by earnings / cash flows; we use EBITDA as the closest cash flow proxy from the income statement. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: EBITDA / Interest Expense
Current Ratio (CA to CL)	Liquidity stock measure. The measure indicates the ability of near-cash assets to pay off current liabilities. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: Current Assets / Current Liabilities
EBIT to Sales	A profit margin that is independent of both the firm's financing and tax position. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: EBIT / Operating Revenue
ROA (in %)	Return on assets. It measures a borrower's ability and efficiency in using its assets to generate operating profits. Further, it reports the total return accruing to all providers of capital (debt and equity), independent of the source of capital. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: EBIT / Total Assets
ROCE (in %)	Return of common equity. It measures returns to the borrower's common shareholders. We use financial data at the end of the year prior to the syndication arrangement. => Calculation: (Net Income - Preferred Dividends) / Average Common Equity
<i>5. Syndicated Loan Characteristics</i>	
Ln(Facility Amount)	Natural logarithm of the facility amount (in US-Dollar).
Ln(Facility Amount)*small	Natural logarithm of the facility amount for loans classified as "small"; the full sample is split into thirds based on the facility amount.
Ln(Facility Amount)*medium	Natural logarithm of the facility amount for loans classified as "medium"; the full sample is split into thirds based on the facility amount.
Ln(Facility Amount)*large	Natural logarithm of the facility amount for loans classified as "large"; the full sample is split into thirds based on the facility amount.
Ln(Maturity, in days)	Natural logarithm of the maturity in days.
Term Loan Indicator	Dummy variable equal to 1 if the facility is a term loan.
> 1 Loan Tranche Indicator	Dummy variable equal to 1 if the deal has more than one facility.
LIBOR-Spread on Drawn Funds (in bps)	Spread above LIBOR in basis points (bps) i.e. the all-in-drawn spread (AIS) as reported in Dealscan.
Performance Pricing Indicator	Dummy variable equal to 1 if the LIBOR-Spread is contingent on ex-post performance of the borrower.
Collateral (Secured) Indicator	Dummy variable equal to 1 if the loan is secured.
Debt Rating Indicator	Dummy variable equal to 1 if the loan issuer has a senior unsecured debt rating.

Table 2
Descriptive Statistics for Syndicated Loan Facilities by Measures of Information Asymmetry

This table presents cell means and standard errors (in parentheses), grouped by measures of information asymmetry, for the sample of 3,146 syndicated loan facilities with Companies House/Hoovers data available, representing 882 different UK-based firms from 1996-2005. Descriptive statistics of borrower characteristics (Panel A) are calculated at the firm level, and descriptive statistics for issue and structure characteristics (Panel B) are calculated at the facility level.

Panel A:	Private Firms (61%)		Public Firms (39%)			
	Priv./ Not Rat.	Priv./ Rat.	Not Stock Exchange Listed		Stock Exchange Listed	
Firm Level Analysis	Priv./ Not Rat.	Priv./ Rat.	Publ./ Not Rat.	Publ./ Rat.	Publ./ Not Rat.	Publ./ Rat.
Percentage of Sample Loan Facilities	0.53	0.08	0.08	0.03	0.19	0.09
Borrower Characteristics⁺						
<u>Information Variables</u>						
Total Assets (in \$m)	506 (52)	1489 (324)	2576 (1194)	8490 (3497)	5017 (2272)	13883 (4401)
Operating Revenue (in \$m)	414 (45)	1525 (466)	1871 (632)	5685 (2090)	5886 (3246)	7168 (1098)
EBITDA (in \$m)	51.15 (6.36)	193 (64)	136 (28)	937 (570)	553 (243)	1201 (264)
Number of Employees	2195 (238)	6946 (2306)	16676 (7479)	21190 (10590)	11475 (1806)	33775 (7982)
Age (years since date of incorporation)	17.02 (1.19)	16.34 (3.13)	24.86 (3.51)	20.34 (6.87)	33.16 (2.40)	38.98 (4.89)
<u>Credit Risk Variables</u>						
Working Capital to Total Assets	0.10 (0.01)	0.11 (0.02)	0.11 (0.02)	0.05 (0.02)	0.17 (0.01)	0.14 (0.02)
EBIT to Total Assets	0.03 (0.01)	0.05 (0.02)	0.05 (0.01)	0.04 (0.01)	0.08 (0.01)	0.07 (0.01)
MV Equity to BV Liabilities					3.19 (0.59)	1.88 (0.47)
Operating Revenue to Total Assets	1.23 (0.11)	1.20 (0.18)	0.92 (0.10)	0.66 (0.07)	1.13 (0.07)	1.05 (0.15)
Leverage Ratio	0.48 (0.02)	0.49 (0.05)	0.37 (0.04)	0.48 (0.08)	0.27 (0.01)	0.38 (0.03)
Interest Coverage	24.04 (7.72)	18.29 (12)	10.57 (4.93)	11.72 (10)	8.48 (1.66)	2.75 (0.39)
<u>Agency Variables</u>						
Intangibles to Assets	0.09 (0.01)	0.10 (0.03)	0.07 (0.02)	0.08 (0.04)	0.15 (0.01)	0.18 (0.03)
Accruals to Assets	-0.01 (0.01)	-0.09 (0.05)	-0.07 (0.15)	-0.03 (0.03)	-0.03 (0.01)	-0.05 (0.01)
<u>Profitability Variables</u>						
ROA (in %)	3.56 (0.85)	3.15 (2.27)	5.25 (1.22)	5.69 (3.40)	7.11 (0.65)	4.74 (1.19)
ROCE (in %)	21.25 (3.56)	21.38 (5.78)	15.34 (2.87)	7.33 (3.05)	16.63 (2.25)	11.90 (2.13)
Industry Composition (SIC 1 digit code)						
Mining, construction, agriculture (0,1)	0.07	0.06	0.09	0.09	0.17	0.03
Manufacturing (2,3)	0.24	0.35	0.24	0.22	0.26	0.41
Transp., comm., gas & electricity (4)	0.21	0.38	0.23	0.52	0.13	0.20
Trade (5)	0.15	0.09	0.13	0.13	0.19	0.21
Industry Group "Real Estate" (6)	0.06	0.00	0.14	0.00	0.05	0.05
Services (7,8)	0.23	0.11	0.15	0.00	0.20	0.11
Utilities (9)	0.03	0.00	0.01	0.04	0.00	0.00

Panel B:	Private Firms (61%)		Public Firms (39%)			
	Priv./ Not Rat.	Priv./ Rat.	Not Stock Exchange Listed		Stock Exchange Listed	
Facility Level Analysis	Priv./ Not Rat.	Priv./ Rat.	Publ./ Not Rat.	Publ./ Rat.	Publ./ Not Rat.	Publ./ Rat.
Issue Characteristics						
Size of Facility (in \$m)	168 (8)	344 (34)	240 (19)	1371 (219)	374 (23)	1355 (128)
Maturity (in days)	2726 (44)	2540 (115)	2090 (104)	1638 (90)	1597 (36)	1425 (52)
LIBOR-Spread on Drawn Funds (in bps)	238 (4.68)	217 (13)	219 (17)	137 (14)	101 (3.48)	107 (8.12)
Performance Pricing Indicator	0.06 (0.01)	0.14 (0.02)	0.07 (0.02)	0.46 (0.05)	0.11 (0.01)	0.27 (0.03)
Collateral (secured) Indicator	0.86 (0.04)	0.84 (0.06)	0.67 (0.11)	0.83 (0.07)	0.53 (0.08)	0.40 (0.08)
Term Loan Indicator	0.47 (0.01)	0.40 (0.03)	0.36 (0.03)	0.37 (0.05)	0.24 (0.02)	0.20 (0.02)
> 1 Loan Tranche Indicator	0.77 (0.01)	0.77 (0.03)	0.55 (0.03)	0.73 (0.04)	0.49 (0.02)	0.61 (0.03)
Purpose of Issue						
General Corporate Purposes	0.13	0.15	0.22	0.10	0.25	0.17
Corporate Control	0.53	0.42	0.34	0.42	0.37	0.37
Capital Structure	0.22	0.29	0.33	0.40	0.29	0.42
Project Finance	0.08	0.10	0.07	0.02	0.03	0.02
Other	0.04	0.04	0.05	0.06	0.06	0.02
Syndicate Structure						
Total Number of Lenders	6.04 (0.15)	11.75 (0.69)	6.22 (0.40)	18.22 (1.36)	9.35 (0.33)	20.01 (0.87)
Total Number of Lead Banks	3.23 (0.10)	7.01 (0.43)	4.05 (0.33)	11.11 (0.91)	5.39 (0.23)	14.19 (0.83)
Total Number of Participant Banks	2.81 (0.12)	4.74 (0.43)	2.16 (0.27)	7.10 (0.93)	3.96 (0.25)	5.82 (0.47)
Average Share held by 1 Lead Bank (in %)*	31.04 (1.80)	14.17 (2.74)	27.15 (3.29)	27.16 (8.00)	16.31 (1.54)	8.04 (1.76)
Average Amount kept by 1 Lead Bank (in \$m)*	45 (11)	51 (15)	65 (22)	122 (35)	50 (11)	99 (19)
Mandated Arranger's Share (in %)**	37.37 (2.16)	10.24 (1.45)	34.21 (5.63)	40.19 (15.22)	19.97 (2.26)	12.63 (2.63)
Herfindahl-Hirschmann Index (HHI)	2801 (182)	1239 (202)	2892 (407)	2077 (741)	1603 (176)	745 (205)

⁺ Averages across all loan facilities by a given firm
^{*} Represents average across lead banks, if there is more than one lead bank on a loan facility
^{**} Represents average across mandated arrangers, if there is more than one mandated arranger on a loan facility

Table 3**Information Asymmetry Syndicate Size Regression Models**

This table presents coefficient estimates from regressions relating syndicate size to borrower information asymmetry; numbers in parentheses are p-values. Dependent variables are the “total number of banks in the syndicate” (# Lenders), the “number of lead banks in the syndicate” (# Leads), the “number of participant banks in the syndicate” (# Parts), and the “number of mandated arrangers in the syndicate” (# Arrs). To control for loan size, the sample is split into thirds based on size, and the intercept (not reported) and natural log of loan size (reported) varies for each group. Standard errors are heteroskedasticity-robust, clustered at the borrowing firm. “Public, stock exchange listed, rated” firms are the omitted group; “Purpose: Other” is the omitted loan purpose group; “Industry: Real Estate” is the omitted loan industry group.

Variables	# Lenders		# Leads		# Parts		# Arrs	
	Market share	Repeat	Market share	Repeat	Market share	Repeat	Market share	Repeat
Priv./Not Rat. Firm	-0.335*** (0.00)	-0.353*** (0.00)	-0.446*** (0.00)	-0.480*** (0.00)	-0.245** (0.01)	-0.250*** (0.00)	-0.370*** (0.00)	-0.398*** (0.00)
Priv./Rat. Firm	-0.140*** (0.00)	-0.132*** (0.00)	-0.176*** (0.00)	-0.184*** (0.00)	-0.190*** (0.00)	-0.185*** (0.00)	-0.065 (0.62)	-0.078 (0.55)
Publ./Not S.E.L./Not Rat. Firm	-0.461*** (0.00)	-0.468*** (0.00)	-0.380*** (0.00)	-0.384*** (0.00)	-0.656*** (0.00)	-0.663*** (0.00)	-0.176* (0.08)	-0.182* (0.07)
Publ./Not S.E.L./Rat. Firm	-0.192*** (0.00)	-0.188*** (0.00)	-0.308*** (0.00)	-0.313*** (0.00)	-0.029 (0.20)	-0.027 (0.19)	-0.128 (0.74)	-0.137 (0.49)
Publ./S.E.L./Not Rat. Firm	-0.215*** (0.00)	-0.215*** (0.00)	-0.210*** (0.00)	-0.220*** (0.00)	-0.207*** (0.00)	-0.198*** (0.00)	-0.139 (0.33)	-0.146 (0.22)
Ln(Operating Revenue)	0.036*** (0.00)	0.035*** (0.00)	0.058*** (0.00)	0.055*** (0.00)	-0.006 (0.61)	-0.005 (0.66)	0.021 (0.35)	0.019 (0.38)
Income to Assets	-0.098 (0.36)	-0.148 (0.16)	-0.059 (0.76)	-0.081 (0.55)	-0.192 (0.27)	-0.248 (0.16)	0.134 (0.69)	0.120 (0.72)
Leverage Ratio	0.108*** (0.00)	0.111*** (0.00)	0.123** (0.01)	0.127** (0.01)	0.052 (0.41)	0.054 (0.39)	0.088 (0.44)	0.082 (0.47)
Ln(Facility Amount)*small	0.052* (0.08)	0.054* (0.07)	0.130*** (0.00)	0.132*** (0.00)	0.038 (0.13)	0.034 (0.19)	-0.089 (0.27)	-0.086 (0.29)
Ln(Facility Amount)*medium	0.340*** (0.00)	0.336*** (0.00)	0.210*** (0.00)	0.203*** (0.00)	0.494*** (0.00)	0.501*** (0.00)	0.070 (0.63)	0.060 (0.68)
Ln(Facility Amount)*large	0.244*** (0.00)	0.245*** (0.00)	0.300*** (0.00)	0.300*** (0.00)	0.104*** (0.00)	0.104*** (0.00)	0.120** (0.03)	0.121** (0.03)
Ln(Maturity, in days)	0.061*** (0.00)	0.058*** (0.00)	0.038** (0.02)	0.032* (0.05)	0.081*** (0.00)	0.082*** (0.00)	0.069* (0.07)	0.062* (0.08)
Term Loan Indicator	-0.032*** (0.00)	-0.030*** (0.00)	-0.062*** (0.00)	-0.058*** (0.00)	-0.034* (0.09)	-0.033* (0.08)	-0.040 (0.55)	-0.037 (0.58)
> 1 Loan Tranche Indicator	0.438*** (0.00)	0.443*** (0.00)	0.603*** (0.00)	0.606*** (0.00)	0.160*** (0.00)	0.169*** (0.00)	0.073 (0.30)	0.072 (0.31)
Purpose: General Corporate	0.096 (0.11)	0.087 (0.15)	0.059 (0.48)	0.046 (0.58)	0.087 (0.32)	0.081 (0.35)	-0.129 (0.50)	-0.150 (0.44)
Purpose: Corporate Control	0.222*** (0.00)	0.217*** (0.00)	0.431*** (0.00)	0.416*** (0.00)	-0.107 (0.20)	-0.099 (0.24)	-0.393** (0.04)	-0.416** (0.03)
Purpose: Capital Structure	0.076 (0.18)	0.063 (0.28)	0.163** (0.04)	0.135* (0.09)	-0.030 (0.72)	-0.028 (0.73)	-0.109 (0.56)	-0.142 (0.45)
Purpose: Project Finance	-0.013 (0.87)	-0.022 (0.79)	-0.100 (0.41)	-0.101 (0.40)	0.048 (0.68)	0.033 (0.77)	-0.508* (0.06)	-0.490* (0.07)
Industry: Mining, construc., agricult.	0.259*** (0.00)	0.259*** (0.00)	0.202** (0.03)	0.208** (0.03)	0.304** (0.01)	0.288** (0.01)	-0.109 (0.58)	-0.100 (0.62)
Industry: Manufacturing	0.213*** (0.00)	0.216*** (0.00)	0.142* (0.09)	0.147* (0.08)	0.349*** (0.00)	0.338*** (0.00)	-0.108 (0.90)	-0.100 (0.56)
Industry: Transp., comm., gas, electr.	0.374*** (0.00)	0.379*** (0.00)	0.316*** (0.00)	0.332*** (0.00)	0.467*** (0.00)	0.459*** (0.00)	-0.022 (0.80)	-0.017 (0.92)
Industry: Trade	0.254*** (0.00)	0.259*** (0.00)	0.002 (0.99)	0.019 (0.83)	0.645*** (0.00)	0.638*** (0.00)	-0.046 (0.49)	-0.043 (0.81)
Industry: Services	0.155** (0.01)	0.159** (0.01)	0.078 (0.37)	0.089 (0.31)	0.272** (0.01)	0.265** (0.01)	0.059 (0.73)	0.060 (0.72)
Industry: Utilities	-0.430** (0.04)	-0.434** (0.04)	-0.586* (0.06)	-0.551* (0.07)	-0.300 (0.33)	-0.353 (0.25)	0.097 (0.80)	0.141 (0.71)
Market share	-0.016*** (0.00)		-0.021*** (0.00)		-0.014*** (0.00)		-0.007 (0.27)	
Repeat		-4.81E-05*** (0.00)		-2.10E-05 (0.13)		-1.06E-04*** (0.00)		2.57E-05 (0.34)
Time	-0.052*** (0.00)	-0.054*** (0.00)	0.016*** (0.00)	0.006 (0.31)	-0.152*** (0.00)	-0.141*** (0.00)	0.294*** (0.00)	0.282*** (0.00)
N	3146	3146	3146	3146	3146	3146	3146	3146
Prob > chi2	0	0	0	0	0	0	0	0
Pseudo R ²	0.3634	0.3623	0.3689	0.3665	0.1767	0.1783	0.1783	0.1782

***Significant at 0 to 1 percent level, **Significant at 1 to 5 percent level, *Significant at 5 to 10 percent level, others: Significant at above 10 percent level

Table 4

Panel A: Information Asymmetry Syndicate Exposure Regression Models / Panel B: Information Asymmetry Syndicate Concentration Regression Models

Panel A presents coefficient estimates from regressions relating syndicate exposure to borrower information asymmetry. The dependent variable is the % share of the loan held by the mandated arranger (% held by ARR). Panel B presents coefficient estimates from regressions relating syndicate concentration to borrower information asymmetry. The dependent variable is the Herfindahl-Hirschman index. Numbers in parentheses are p-values. "Full Sample" regressions include all firms, whereas "Private Sample" ("Public Sample") includes private (public) firms only. Number of observations change with the availability of Companies House and % held by ARR / Herfindahl-Hirschman index information. Standard errors are heteroskedasticity-robust, clustered at the borrowing firm. All regressions include industry dummies (not reported).

Variables	Panel A: Exposure Regression Models						Panel B: Concentration Regression Models					
	Full Sample		Private Sample	Public Sample			Full Sample		Private Sample	Public Sample		
	% held by ARR	% held by ARR	% held by ARR	% held by ARR	% held by ARR	% held by ARR	Herfindahl	Herfindahl	Herfindahl	Herfindahl	Herfindahl	Herfindahl
Rating	-6.127** (0.04)		-22.427*** (0.00)	-2.101* (0.08)			-707.596*** (0.00)		-1034.418** (0.03)	-510.671** (0.02)		
Stock Exchange Listing		-2.047* (0.06)			-13.104** (0.04)			-424.761*** (0.00)			-1085.489*** (0.00)	
Rating & Stock Exchange Listing												-903.066** (0.01)
Ln(Operating Revenue)	-1.440*** (0.00)	-1.551*** (0.00)	-0.982* (0.08)	-3.748*** (0.00)	-3.427*** (0.00)	-3.234*** (0.00)	-140.384** (0.01)	-169.248** (0.02)	-240.479** (0.04)	-36.619* (0.06)	-50.542* (0.09)	-47.373* (0.09)
Income to Assets	-54.033*** (0.00)	-53.095*** (0.00)	-26.849 (0.76)	-46.455* (0.09)	-39.400* (0.09)	-39.400* (0.09)	-1827.151* (0.05)	-1932.686** (0.04)	-1324.207 (0.37)	-688.682 (0.76)	-492.104 (0.83)	-492.104 (0.83)
Leverage Ratio	-11.078 (0.12)	-11.242 (0.11)	-10.405 (0.33)	-1.808 (0.88)	-3.642 (0.75)	-3.642 (0.75)	-356.758 (0.33)	-402.273 (0.20)	110.557 (0.32)	-441.107 (0.41)	-477.422 (0.31)	-477.422 (0.31)
Ln(Facility Amount)*small	-2.971*** (0.00)	-3.047*** (0.00)	-2.835* (0.07)	-8.328 (0.11)	-9.459* (0.09)	-8.659* (0.08)	-237.490 (0.30)	-250.685 (0.30)	-261.846 (0.37)	-818.317 (0.19)	-855.930 (0.19)	-822.749 (0.21)
Ln(Facility Amount)*medium	-4.460** (0.04)	-6.290* (0.06)	0.367 (0.18)	-8.446 (0.23)	-7.313 (0.25)	-8.799 (0.27)	-875.408** (0.03)	-1002.886* (0.06)	555.467 (0.57)	-1611.970** (0.02)	-1535.104** (0.03)	-1603.121** (0.02)
Ln(Facility Amount)*large	2.964*** (0.00)	2.663*** (0.00)	-0.046 (0.21)	5.244** (0.03)	5.339*** (0.00)	5.821** (0.04)	204.867 (0.29)	51.299 (0.37)	-180.454 (0.81)	-23.382 (0.30)	-152.760 (0.41)	-40.656 (0.49)
Ln(Maturity, in days)	-0.547** (0.03)	-0.868* (0.07)	-0.036 (0.26)	-1.067 (0.14)	-1.457* (0.08)	-0.993* (0.09)	-61.200*** (0.00)	-63.857** (0.03)	-91.950*** (0.00)	-66.253* (0.09)	-98.480** (0.04)	-78.057* (0.05)
Term Loan Indicator	0.730 (0.81)	0.791 (0.80)	1.921 (0.58)	-1.414 (0.78)	-0.939 (0.90)	-1.215 (0.81)	186.667*** (0.00)	201.618*** (0.00)	332.944*** (0.00)	123.837** (0.01)	137.182** (0.03)	133.599* (0.06)
> 1 Loan Tranche Indicator	-1.078 (0.29)	-0.934 (0.36)	-4.470* (0.05)	0.532 (0.66)	0.393 (0.93)	0.318 (0.79)	-540.878** (0.01)	-599.733** (0.01)	-274.577* (0.09)	-629.079** (0.03)	-681.779** (0.02)	-659.749** (0.03)
Purpose: General Corporate	2.271 (0.39)	2.182 (0.40)	4.946 (0.29)	-1.675 (0.65)	-1.250 (0.53)	-1.984 (0.67)	150.315 (0.33)	148.674 (0.34)	484.294 (0.16)	-115.812 (0.85)	-223.354 (0.73)	-152.870 (0.80)
Purpose: Corporate Control	3.816 (0.13)	3.716 (0.14)	7.267* (0.08)	-2.194 (0.56)	-2.489 (0.54)	-2.134 (0.61)	203.816 (0.17)	212.345 (0.16)	177.554 (0.57)	185.295 (0.38)	160.161 (0.47)	176.218 (0.45)
Purpose: Capital Structure	-2.140 (0.41)	-2.331 (0.37)	-0.061 (0.91)	-6.505** (0.04)	-6.966* (0.06)	-6.640* (0.07)	-138.692 (0.75)	-108.032 (0.80)	-138.829 (0.87)	-215.603 (0.60)	-284.271 (0.53)	-228.948 (0.58)
Purpose: Project Finance	-3.677 (0.36)	-3.321 (0.39)	-0.996 (0.84)	-12.505 (0.18)	-12.754 (0.16)	-14.985 (0.12)	-263.655 (0.47)	-149.240 (0.59)	-207.981 (0.70)	-680.239 (0.33)	-434.415 (0.40)	-556.045 (0.37)
Market share	0.810* (0.07)	0.855* (0.06)	2.594*** (0.00)	-1.305* (0.08)	-1.242* (0.09)	-1.405* (0.06)	20.692 (0.60)	23.328 (0.56)	140.956** (0.04)	-41.731 (0.46)	-36.897 (0.50)	-41.508 (0.47)
Time	0.906 (0.37)	0.857 (0.39)	-1.186 (0.42)	0.966*** (0.00)	1.150*** (0.00)	1.233*** (0.00)	199.113*** (0.00)	189.357*** (0.00)	87.042 (0.37)	308.998*** (0.00)	302.322*** (0.00)	307.344*** (0.00)
N	597	597	292	305	305	305	774	774	379	395	395	395
Prob > F	0	0	0	0	0	0	0	0	0	0	0	0
Adjusted R ²	0.4834	0.4836	0.6648	0.4247	0.4578	0.4578	0.394	0.386	0.534	0.306	0.302	0.302

***Significant at 0 to 1 percent level, **Significant at 1 to 5 percent level, *Significant at 5 to 10 percent level, others: Significant at above 10 percent level

Table 5**Panel A: Alternative Measures of Information Asymmetry / Credit Risk Regression Models – Private Firms****Panel B: Alternative Measures of Information Asymmetry Regression Models – Public Firms**

Panel A (Panel B) presents coefficient estimates from regressions relating syndicate structure to alternative measures of information asymmetry/credit risk among private (public) borrowers; the numbers in parentheses are p-values. The dependent variable in the left tables is the Herfindahl-Hirschman index; in the right tables it is the % share of the loan held by the mandated arranger. Number of observations change with the availability of Companies House and Herfindahl-Hirschman index / % held by mandated arranger information. All regressions include loan amount, maturity, term and tranche controls listed in Table 4, loan purpose and industry dummies, market share and time index variables (not reported). Standard errors are heteroskedasticity-robust, clustered at the borrowing firm.

Variables	<i>Dependent Variable: Herfindahl</i>					<i>Dependent Variable: % held by Mandated Arranger</i>				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Ln(1+fraction of other firms in industry)	-40422.150*** (0.00)					-528.317*** (0.00)				
Ln(1+years since incorporation)		591.202*** (0.00)					5.943*** (0.00)			
Tangibles to Assets			-404.927 (0.51)					16.457 (0.49)		
Current Ratio (CA to CL)				-184.318* (0.08)					-1.716* (0.08)	
EBIT to Sales					-2161.015 (0.17)					-9.008 (0.28)
Income to Assets	-325.309 (0.66)	-1194.379* (0.08)	-469.372 (0.56)	-447.219 (0.57)	-395.262 (0.71)	-75.730* (0.07)	-91.925* (0.07)	-38.981 (0.71)	-44.447 (0.77)	-31.287 (0.78)
Leverage Ratio	361.545 (0.50)	220.998 (0.69)	28.088 (0.91)	283.850 (0.79)	13.629 (0.93)	-6.581 (0.38)	-14.596* (0.09)	-10.944 (0.31)	-7.107 (0.41)	-6.027 (0.55)
Ln(Operating Revenue)	-196.975* (0.08)	-253.533*** (0.00)	-215.551** (0.04)	-265.174** (0.04)	-287.143** (0.02)	-0.994* (0.06)	-1.403*** (0.00)	-1.461** (0.01)	-1.162** (0.04)	-1.887* (0.05)
N	379	379	379	379	379	292	292	292	292	292
Prob > F	0	0	0	0	0	0	0	0	0	0
Adjusted R ²	0.707	0.662	0.520	0.524	0.539	0.760	0.704	0.631	0.614	0.607
Panel B: Public Firms										
Variables	<i>Dependent Variable: Herfindahl</i>					<i>Dependent Variable: % held by Mandated Arranger</i>				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Ln(1+fraction of other firms in industry)	-6426.129* (0.08)					-32.501 (0.67)				
Ln(1+years since incorporation)		-0.893 (0.53)					-1.053* (0.06)			
Ln(1+years since IPO)			-13.181 (0.20)					-1.345 (0.58)		
Firm with several Exchange Listings				-437.540*** (0.00)					-0.922 (0.31)	
Market to Book					56.808* (0.09)					1.639** (0.04)
Income to Assets	-547.785 (0.63)	-379.455 (0.71)	-123.060 (0.18)	-180.713 (0.27)	-313.812 (0.76)	-30.874** (0.03)	-36.430** (0.04)	-9.438 (0.56)	-39.506** (0.04)	-32.941* (0.06)
Leverage Ratio	-13.424 (0.11)	-135.992 (0.20)	-232.232 (0.37)	-133.911 (0.36)	-300.812 (0.28)	0.252 (0.91)	-2.545 (0.83)	-6.540 (0.59)	-1.601 (0.41)	-1.867 (0.67)
Ln(Operating Revenue)	-73.287*** (0.00)	-78.123*** (0.00)	-58.550* (0.08)	-56.019* (0.09)	-57.662** (0.03)	-3.802*** (0.00)	-3.666*** (0.00)	-3.587*** (0.00)	-4.385*** (0.00)	-4.893*** (0.00)
N	395	395	284	284	284	305	305	219	219	219
Prob > F	0	0	0	0.0003	0.0002	0	0	0	0	0
Adjusted R ²	0.314	0.299	0.339	0.259	0.194	0.408	0.412	0.593	0.503	0.485

***Significant at 0 to 1 percent level, **Significant at 1 to 5 percent level, *Significant at 5 to 10 percent level, others: Significant at above 10 percent level