Common information asymmetry factors in syndicated loan structures: evidence from syndications and privately placed deals

by

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Comments are welcomed.

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Abstract

This paper provides a comprehensive study of the syndicate structure and its relationship to information asymmetry and loan spread by using principal component analysis on an exhaustive set of 40 variables. A total of six structure components are identified and related to the syndicate quality, its members' heterogeneity, the lead arranger's characteristics, the geography of the syndicate or its lead lender, the relations between the borrower and the lenders and the lender's industry. Using conditional and propensity score matching models, differing structure components are responsible for the lower spreads associated with privately placed loans as opposed to traditional syndications.

Keywords: syndicated loan market; principal component analysis, syndicate structure; information asymmetry; privately placed deal; matching models

JEL Classification: C31, C38, G21, F34, L14

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1. Introduction

From the extensive research that has been conducted in the past fifteen years on syndicated loans, we know that one of the key differences between syndicated loans and bilateral loans (or sole lender loans) is the addition of lender-lender relationships between the syndicate members and their associated advantages and inconveniences often related to information asymmetry.

The way the syndicate is structured serves as a mechanism to address agency problems between syndicate members. However, the syndicate is not necessarily structured in a way that minimizes the cost for the borrower. Further, not each and every structure variable is determined or positioned in a way that reduces asymmetric information problems and the associated premium. This brings forward an important interrogation regarding the benefits and costs of syndicates. On the one hand, it is well known that an important advantage of syndicated loans is the diversification benefit for lenders, which ultimately leads to lower costs for the borrower (see, e.g., Angbazo et al., 1998; Dennis et al., 2000). On the other hand, agency problems within the syndicate can lead to an asymmetric information premium that is ultimately charged to the borrower. For instance, Ivashina (2009) finds that information asymmetry within the lending syndicate accounts for approximately 4% of the total credit cost.

But, although many papers have examined the impact of the structure on the spread or other loan terms, most have focused on one or two structure measures, typically the retention by the lead arranger and the number of lenders. Although very important, these variables do not capture the multidimensionality of the syndicate structure that includes many different characteristics that combine and interact to increase or decrease the concentration and information asymmetry premiums of a loan.

In a graph with the spectrum of the concentration (or diversification) premium on the horizontal axis and the information asymmetry premium on the vertical axis, different loan

distribution methods can be placed in the quadrants, as shown in Figure 1. In the upper-left quadrant are bilateral loans, where the asymmetric information (within the syndicate) premium is at its lowest but where the concentration risk premium is at its highest, everything else held equal. In the lower-right quadrant are syndications, where the concentration risk premium is lower but where the asymmetric information premium is higher, everything else held equal. However, there can be a lot of variation in terms of premiums within the syndication quadrant, making the comparison of different syndicate structures very difficult. Not only can there be a lot of variation on one dimension, but different syndicate structure characteristics, affecting the premium differently (e.g. with opposite signs), can complicate things further.

The first purpose of the paper is therefore to identify the principal components of the syndicate structure. This will not only allow us to capture all the major characteristics of a syndicate structure without generating unnecessary multicollinearity in multivariate settings, but also to combine structure metrics into a small number of significant, easily interpretable, components. The structure components can then be used in multivariate syndicated loan spread models to analyse their marginal impact on the loan premium.

The second purpose of the paper is to use the structure components to compare two syndicated loan distribution methods that differ in terms of information asymmetry, namely traditional syndications and privately placed deals (club deals).[1] Since, by definition, privately placed deals are structured differently than syndications, they represent a very interesting instrument through which examine information asymmetries, syndicate structure and loan spread.

Descriptive statistics show that, on average, loan spreads and fees are lower for privately placed deals than for syndications (102.5 bps vs 142.59 bps), indicating lower financing costs for

[1]Taylor & Sansone, 2007 define a club deal as "a smaller loan that is premarketed to a group of relationship banks. The arranger is generally a first among equals, and each lender gets a full cut, or nearly a full cut of the fees". Although the borrower normally has the right to know what institutions are participating in the syndicate, the selection of members is usually made by the lead arranger. In a club deal, the borrower requests the participation of specific institutions.

the borrower. Although part of the explanation resides in differing borrower and loan characteristics for privately placed deals, it also lies in privately placed deals and syndications' differing syndicate structures. A priori, since privately placed deals are (at least partly) determined by borrowers, because lenders are typically equally exposed to risk within the syndicate and because they are typically more homogeneous, they should be less prone to agency problems.[2] One would therefore anticipate privately placed deals to be somewhere between bilateral loans and syndications in Figure 1, perhaps in the lower-left quadrant.

The contributions of this paper to the syndicated loans literature are threefold. Firstly, by identifying common syndicate structure factors related to information asymmetries across syndicated loans, this paper provides a new approach to characterize and quantify the multidimensional structure of a syndicate. While most papers focus on one or two variables, usually related to syndicate size and lead share retention, to proxy for syndicate structure, we use an extensive set of 40 to capture all the different aspects of a syndicate that may be related to information asymmetries. Starting with this set of 40 structure variables, it is shown that six components account for more than 60% of the variability in international syndicate structures and that the components can be interpreted as the quality of the syndicate, the heterogeneity of its members, the characteristics of the lead arranger, the geography of the syndication and its lead arranger, the average relations between the borrower and the syndicate members, and the lender industry. Secondly, this paper re-examines the impact of syndicate structure on the loan spread using principal components that capture the multidimensionality of syndicate structure, and finds that the components are significant determinants of the loan spread and that some of the structure components are endogenously determined.

Thirdly, the paper uses the six structure components to compare the spread between two

[2] Focarelli et al. (2008) find that privately placed deals are associated with lower interest rates. Although the distinction between such club deals and syndications is not the focus of their study, they mention that this is "possibly because they are underwritten within groups of borrowers with stronger relationships, where agency problems are lower."

syndicated loan distribution methods that differ in terms of information asymmetry: traditional syndications and privately placed deals. Results show that privately placed deals are structured in a way that reduces the information asymmetry premium included in the loan spread. Specifically, in multivariate regressions controlling for borrower and loan characteristics, privately placed deals are related to lower spreads by as much 21.5 bps. Using conditional methods and matching models, it is shown that the lower spread can be explained by an intrinsically different syndicate structure for privately placed deals.

The remainder of the paper is organized as follows. Section two discusses the determinants of syndicate structure and loan spreads based on the literature. Section three presents the methodology and the results obtained from the principal component analysis and the multivariate models of loan spread and syndicate structure. Section four analyses and discusses the difference in the syndicate structure between two distribution methods. Section five concludes the paper.

2. The determinants of syndicate structure and loan spread

To our knowledge, no previous study has addressed the issue of the multidimensionality of the syndicate structure and the identification of structure components or the impact of the syndicated loan's distribution method on the syndicate structure and/or the loan spread. However, there is a large literature on the relationship between syndicate structure and agency problems and on the relationship between the structure and loan terms.

2.1 Syndicate structure and information asymmetries

The structure of a loan syndicate has been extensively studied in the past fifteen years and this research has generally come to the conclusion that it is related to the information asymmetries between the lead arranger and the participants in the syndicate and between the lenders and the borrowers. There are two types of agency problems observed in this context: moral hazard and adverse selection problems. The first problem, moral hazard, occurs when the

lead arranger reduces its incentive to monitor the loan optimally once it is not responsible for the totality of it (Jensen and Meckling, 1976). The second problem, adverse selection, arises when the lead arranger has private information about the borrower acquired through due diligence or prior relationships with the borrower. If the other members of the syndicate don't have access to this information, a lemons problem can occur if the lead retains a larger portion of the best-quality loans and lower portion of the lower-quality loans.

While the structure of the syndicate can theoretically be seen both as a consequence of or a solution to agency problems, studies generally conclude that the syndicate is structured to reduce agency problems between the agents involved. Different measures of syndicate structure have been used in the literature, often individually, such as the proportion of the loan retained by the lead arranger, the concentration of the loan and the number of lenders. The characteristics of the lead arrangers have been shown to be significant determinants of syndicate structure. For example, the proportion of the loan that is retained by the lead arranger has been shown to be negatively related to the reputation of the lead (Panyagometh and Roberts, 2010). The quantity and quality of information about the borrower have also been shown to have an impact on the syndicate structure. They are negatively related to the share retained by the lead lender (Simons, 1993) and positively related to the number of lenders in the syndicate (Dennis and Mullineaux, 2000). Panyagometh and Roberts (2002) find that lead lenders syndicate a larger portion of loans that are subsequently upgraded, a sign that lead banks don't have exploitative behaviour, while Jones et al. (2000) observe a negative relation between loan rating and lead share. However, they also highlight that arrangers may still exploit their informational advantage and syndicate more of the low quality loans than the syndicate members would have accepted under a symmetric-information environment.

Loan syndicates can also imply a free riding problem which reduces each lender's incentive to monitor and renegotiate if necessary. For instance, Preece and Mullineaux (1996) find that the syndicate size (i.e. the number of lenders) is negatively related to abnormal returns following loan

announcements because of the higher renegotiation costs. Further, Esty and Megginson (2003) conclude that fewer lenders represent best practices to promote monitoring efficiency and flexibility in restructuring and that, in countries with strong creditor rights and reliable legal enforcement, lenders create smaller and more concentrated syndicates to facilitate monitoring and low cost contracting. Lee and Mullineaux (2004) observe that smaller and more concentrated syndicates are more likely to be formed for riskier borrowers. Sufi (2007) observes that lead arrangers retain a larger share and form more concentrated syndicates when borrowers require more intense due diligence and monitoring. Missonier-Piera and François (2007) analyze another aspect of the syndicate structure, namely the number and concentration of co-agents (vs lead arrangers). They find evidence to support both the specialization hypothesis which states that multiple co-agents arise because of the different competitive advantages and the monitoring hypothesis which states that multiple co-agents arise to mitigate informational asymmetry problems. On the other hand, since low cost restructuring can encourage borrowers to default strategically, creditors may have an incentive to increase the size of the syndicate to make default more costly or to impose a future penalty on defaulting firms (Bolton and Scharfstein, 1996; Chowdhry, 1991).

2.2 Syndicate structure and loan terms

The impact of syndicate structure on loan terms has also been studied, mostly using the syndicate size and lead arranger share as the only measures of structure. For instance, Coleman et al. (2006) find that larger banking syndicates lend for longer maturities, but due to a decline in contractual flexibility and monitoring, lend at lower yield spreads. Some papers use other, non-size-related, characteristics of syndicate structure. In addition to syndicate size, Vu (2008) uses syndicate concentration and lead retention as measures of structure and concludes that loan yields are higher for a syndicated loan with fewer lenders, higher concentration and larger retention. Finally, Ivashina (2009) argues that in equilibrium the information asymmetry premium required by the participants is offset by the diversification premium required by the lead arranger, which

increases with the lead share. An increase in the lead share therefore increases the loan spread.

Overall, although the literature on syndicated loans has evolved dramatically over the past fifteen years, there are still many unanswered questions regarding these financing instruments, notably on the way they are structured. As shown in Figure 1, which illustrates a simple decomposition of the loan premium, different loan distribution methods differ according to the resulting concentration and information asymmetry premiums that are ultimately charged to the borrowers. On average, syndications involve many lenders, which reduces considerably the concentration premium, everything else held equal. However, because of adverse selection and moral hazard problems, syndications are more exposed to an information asymmetry premium that is required by the lenders.

[Please insert Figure 1 about here.]

However, simply positioning the different distribution methods in one of the quadrant is overly simplistic. Specifically, because of the multidimensionality of syndicate structure, there can be a lot of variation within a quadrant, especially for privately placed deals and syndications. For example, varying number of lenders, everything else held equal, can affect the position of two loans, as illustrated by the two empty circles in the lower-right quadrant in Figure 1. Syndicate density is another determinant of information asymmetries that can affect the position of the syndicate in the quadrant, as illustrated by the black-filled circle in the lower-right quadrant. Finally, considering only one factor at a time does not give a complete characterization of the syndicate structure since structure variables combine and interact to affect the spread differently. For instance, where would larger but denser, or smaller but more heterogeneous syndicates be positioned in the quadrant? The same applies for privately placed deal syndicates that, although smaller in size on average, can also vary in terms of number of lenders, concentration, heterogeneity, etc. A way to combine the multiple aspects of the syndicate structure is needed, and principal component analysis allows us to identify the major dimensions of a syndicate.

3. Syndicate structure components

3.1 Sample of syndicated loans

An international sample that consists of (non-)public lending institutions participating in loan syndicates between 1998 and 2009 is generated from Dealscan, a database of loans to large firms maintained by Reuters' Loan Pricing Corporation (LPC). The database includes information on various deal-related variables, such as the market of syndication, distribution method and lender role. Corporate information about the lenders and borrowers is taken from the Compustat Global database.

3.2 Syndicate structure components

One of the difficulties when trying to study the structure of syndicates or account for it in empirical analyses is the number and variety of variables that capture different aspects of the structure. Such variables can be related to the quality or reputation of the lead arrangers or the participants, past relationships among the syndicate members, the concentration of shares, etc. These variables can all be directly or indirectly related to the information asymmetry and/or concentration premium discussed earlier. Further, they combine and interact in ways that are not yet well understood.

We use principal component analysis to better understand the multidimensionality of syndicate structure and to develop a smaller number of artificial variables or components that will account for most of the variance in the observed structure variables. A total of 40 structure variables are considered in order to build the components. These structure variables are partly based on previous research (e.g. Esty and Megginson, 2003; Ivashina 2009) and partly based on our own measures of syndicate characteristics, syndicate concentration and information asymmetries between the syndicate members and between the syndicate members and the borrower. The variables are defined in Appendix A. Table 1 shows the descriptive statistics for

the 40 structure variables studied, as well as their correlation coefficient with loan spread.[3]

[Please insert table 1 about here.]

Among the structure variables that are most correlated with the spread, which serves here as a proxy for the information asymmetry premium, are the concentration measures (*HH-INDEX:* 0.33 and *TOP3:* 0.34), the number of lenders (*LENDERS*: -0.195), the industry of the lead arranger (*LEAD-BANK*: -0.22 and *LEAD-INVEST*: 0.15), the number of countries or industries involved in the syndicate (*COUNTRIES*: -0.247 and *INDUSTRIES*: 0.19), the average relationships between the syndicate lenders in terms of intensity and duration (*INTENSITY-SYND*: -0.148 and *DURATION-SYND*: -0.15), the asymmetry in the connections, reputation, market share, importance and experience among the syndicate members (*ASYMMETRY-INTENSITY*: -0.198, *ASYMMETRY-DURATION*: -0.15, *ASYMMETRY-REPUTATION*: -0.14, *ASYMMETRY-MARKETSHARE*: -0.136, *ASYMMETRY-IMPORTANCE*: -0.17 and *ASYMMETRY-EXPERIENCE*: -0.12) and the region of syndication (*SYND-US-CA*: 0.157 and *SYND-ASIA*:-0.157).

Because of data availability, principal component analysis is conducted on two sets of structure variables: i) the subset of 36 items that excludes the four concentration-related variables (i.e. *LEAD-EXPOSURE, HH-INDEX, LEAD-SHARE AND TOP3*), and ii) the entire set of 40 structure variables. The following orthogonal linear transformation of the data matrix X containing the structure variables is performed:

$$\begin{aligned} Y^T &= X^T W \\ &= V \sum^T \end{aligned}$$

where the matrices W, Σ and V are given by a singular value decomposition of X. Because the structure variables are measured on different scales or units, the correlation matrix is used instead

[3] The entire correlation coefficient matrix between the 40 structure variables is untabulated but is available upon request. Correlation coefficients vary greatly, ranging between 0 and 96.5%, and can be positive or negative according to the structure variable.

of the covariance matrix. In order to determine the number of components that will be retained for subsequent analysis, a combination of criteria is used. Based on the Kaiser criterion, or the eigenvalue-one criterion, only components with an eigenvalue greater than 1 are considered. Components' eigenvalues are available in table 2. According to the Kaiser criterion, 11 components would be retained. However, only the first five components account for at least 5% each of the total variance, which is often considered as another criterion for inclusion. Further, a look at the cumulative percent of variance shows that the first six components together account for 62.12% of the variance. An examination of the scree plot of the eigenvalues (not shown) indicates that the number of components is more likely between 5 and 7.

[Please insert table 2 about here.]

Finally, the rotated factor patterns, obtained using orthogonal varimax rotation, indicate that components 7 to 11 are not significantly loaded by enough items that are not also loading on other components.[4] Upon reviewing the above criteria, and to ensure the interpretability of all the components, six components are retained for subsequent analyses. The rotated factor patterns obtained using six components are available in Panel A of table 3.

[Please insert table 3 about here.]

Based on the highest loading variables for each component, which are arbitrarily defined as variables that load with an optimal weight greater than $\left|0.4\right|$ for a particular component while not significantly loading on any other component, the six components can be interpreted as follows:

1. Syndicate quality component (*QUALITY*): measures the quality of syndicate members and their relationships with one another as indicated by the length and the intensity of their past connections, as well as the average reputation, market share, importance in the

[4] The rotated factor patterns for the 11 components with eigenvalues greater than 1 are not shown but are available upon request. Further, we arbitrarily set the weight at 0.4 to determine "significant" variables in a component.

loan market and experience of the syndicate members.

2. Syndicate member heterogeneity component (*HETEROGENEITY*): measures the heterogeneity of syndicate members in terms of the number of countries involved and in terms of the asymmetry of the intensity and duration of past alliances between lenders. It also captures the heterogeneity that is due to the number of lenders and participants.
3. Lead arranger component (*LEAD*): measures the quality of the syndicate's lead arranger in terms of reputation, market share, importance and experience.
4. Syndicate geography component (*GEOGRAPHY*): measures the geographical location of the lead arranger and the region of syndication.
5. Relationship component (*RELATIONSHIP*): measures the intensity and duration of the relationship between the syndicate members (leads and participants) and the borrower. Everything else held equal, the stronger the relationship, the lower the information asymmetry between the syndicate members and the borrower.
6. Industry component (*INDUSTRY*): indicates the type of lead arranger in terms of its financial sector (bank or investment firm).

As a robustness test, a principal component analysis is also conducted on the quantiles of the structure variables instead of their actual measures (in table 1) in order to get uniform units across the variables. For each non-dichotomous variable, observations are divided into 5 quantiles. The item used in the analysis is then assigned to one of the five quantile rankings. For dichotomous variables, observations are assigned 1 (lower quantile) if equal to zero and assigned 5 (highest quantile) if equal to one. Resulting components and rotated factor optimal weights are relatively similar, as shown in Panel B of Table 3.

Analysis of the principal components on the entire set of 40 structure variables, including the four concentration variables, shows that the second component is now related also to concentration variables (*HH-INDEX* and *TOP3*), while the *GEOGRAPHY* and the *LEAD*

components simply change position (in terms of the percentage of variance explained), as shown in Panel C of Table 3. The remaining components are relatively similar. Interestingly, the proportion of the variance explained by the second component is similar in both cases (with or without concentration variables), which may indicate that the two components can act as substitutes.

3.3 Factor scores and weighted factor-based scores

In order to use the components in subsequent analysis, two types of measures are calculated: component scores and weighted factor-based scores. A component score (or factor score) is a linear composite of the optimally-weighted observed variables. One factor score per component is computed for each observation in the sample based on the optimal weights given in panel A of table 3. As opposed to a component score, a factor-based score is a linear composite of the variables that demonstrate *meaningful* loadings for the component in question. Since they are not true principal components, they can demonstrate nonzero correlation with one another. However, two of the advantages of factor-based scores are their tractability and interpretability since they are based on fewer distinct variables. Based on the meaningful loading variables for each component, which are arbitrarily defined as variables that load with an optimal weight greater than $\left|0.4\right|$ for a particular component (identified in grey shading in Panel A of table 3) and not significantly loading on any other component (identified in bold in Panel A of table 3), variables are weighted by their loading factor and added together to obtain factor-based scores.[5] The following artificial variables are thus created:

[5] Weighted factor-based scores based solely on the first condition (i.e. weight greater than $\left|0.4\right|$) yield very similar results.

$$QUALITY = W_1 \times INTENSITY - SYND + W_2 \times DURATION - SYND + W_3 \times MARKETSHARE - SYND + W_4 \times IMPORTANCE - SYND + W_5 \times EXPERIENCE - SYND$$

$$HETEROGENEITY = W_1 \times LENDERS + W_2 \times PARTICIPANTS + W_3 \times COUNTRIES + W_4 \times ASYMMETRY - INTENSITY + W_5 \times ASYMMETRY - DURATION$$

$$LEAD = W_1 \times REPUTATION - LEAD + W_2 \times MARKETSHARE - LEAD + W_3 \times IMPORTANCE - LEAD + W_4 \times EXPERIENCE - LEAD$$

$$GEOGRAPHY = W_1 \times LEADS + W_2 \times INTERNATIONAL + W_3 \times LEAD - US + W_4 \times LEAD - UK + W_5 \times SYND - US - CA + W_6 \times SYND - EUROPE$$

$$RELATIONS = W_1 \times REL - LENDERS + W_2 \times REL - LEADS + W_3 \times DURATION - LENDERS + W_4 \times DURATION - LEADS$$

$$INDUSTRY = W_1 \times LEAD - BANK + W_2 \times LEAD - INVEST$$

Where W_i is the weight of the variable in the component, as given in Panel A of Table 3, with two exceptions. For the *GEOGRAPHY* and *INDUSTRY* components, positive and negative loadings make the interpretation of the factor-based score difficult. To address this issue, *LEAD-US*, *SYND-US-CA* and *LEAD-INVEST* are recoded to vary in the opposite direction, while the remaining loadings are multiplied by -1 to obtain positive weights everywhere.[6] A high score for *INDUSTRY* therefore implies that the lead arranger is a bank and not an investment firm. Similarly, the highest score for *GEOGRAPHY* would be for a structure in which the lead is not from the U.S. but from the U.K. and that is not syndicated in the U.S. or Canada but in Western Europe.

For the case with concentration variables, the *HETEROGENEITY* component is changed

[6] Because rotated factor weights are based on the correlation matrix, the recoding simply changes the signs of the weights and not their value.

to a concentration component:[7]

$$CONCENTRATION = W_1 \times LENDERS + W_2 \times PARTICIPANTS + W_3 \times HH - INDEX + \\ + W_4 \times TOP3 + W_5 \times ASYMMETRY - DURATION$$

The scores for the six components, including *CONCENTRATION*, are recalculated using weights from Panel C of table 3. Again, to make the interpretation of the resulting factor-based score easier, *HH-INDEX* and *TOP3* are recoded so that all the loadings are positive. A higher factor-based score therefore implies a lower concentration index or top3 share, everything else held equal.

3.4 Multivariate analysis of the loan spread

The impact of the syndicate structure on the loan spread has been studied previously. However, studies typically consider one or two structure measures at a time, which does not capture the multidimensionality of syndicate structure. Yet, because structure variables are correlated, adding all or most relevant variables induces an important multicollinearity problem in any multivariate analysis. Instead of adding multiple variables to capture different aspects of the syndicate structure, a different methodology is used herein. Each loan's component score (factor score) or weighted factor-based score to each of the six components are added as explanatory variables in a multivariate model of the loan spread.

The appropriate model to consider both the syndicate structure and the loan spread must nonetheless be determined. Although these two variables have been studied one more than one occasion in the literature, they have been modelised in numerous ways. Firstly, the relationship between the spread and the syndicate structure is not clear. While the majority of studies examine unilateral relations (see, for example, Angbazo et al., 1998), some studies provide evidence that bilateral relationships more appropriately capture the simultaneous determination of the spread and the structure, at least as measured by the lead arranger share (Ivashina, 2009). Secondly, the

[7] Results are qualitatively similar if the two meaningful concentration variables are added to the five original *HETEROGENEITY* components.

determination of non-price terms is ambiguous. Ivashina (2009) argues that the structure and spread are determined simultaneously but after the non-price terms have been negotiated. On the other hand, Coleman et al. (2006) find that syndicate size affects loan maturity and Vu (2008) accounts for the endogeneity of non-price terms and structure and finds a link between the presence of collateral and the syndicate structure. Thus, the research strategy adopted herein is to study loan spread and syndicate structure both separately and simultaneously. The general form of the spread model examined is the following:

$$SPREAD_l = \beta_0 + \sum_{i=1}^{6} \beta_i \times STRUCTURE_{i,l} + \sum_{i=7}^{N} \beta_i \times X_{i,l} + \varepsilon_l \quad (1)$$

In model (1), $SPREAD_l$ is the all-in loan spread over *LIBOR* for loan *l*, $STRUCTURE_{i,l}$ is either the component score or the weighted factor-score for one of the six syndicate structure components identified previously for loan *l*, and $X_{j,l}$ is one of the loan-specific, borrower-specific or calendar control variables for loan *l*. In order to control for the most potential risk factors, including loan type and purpose, observations are taken at the facility level.[8] Based on existing theories and the availability of variables, the following set of exogenous variables is used, where the variable definitions are provided in Appendix B:

$X_{(1)}$ = *[SIZE, RELAMT, LEVERAGE, PROFIT, DEBTA, OPAQUE, ECON-DEV, EMERGING, LEGAL, MTY, AMT, TRANCHES, MULT-TRANCHE, SECURED, COVENANT, SENIOR, BORROWER-COUNTRY, BORROWER-INDUSTRY, TYPE, PURPOSE, YEAR]*

Descriptive statistics for the components and the control variables used in the regressions are available in table 4, while table 5 shows the results for the evaluation of model (1) using the

[8] Untabulated robustness tests show that results are similar when done on deal level observations.

structure components as exogenously-determined right-hand side variables.[9] Results using component scores or weighted factor-based scores, as shown in Panels A and B, are relatively similar in terms of inference but differ in terms of magnitude, especially for the structure components. Because they are easier to interpret and track, the following analysis will be based on the results using weighted factor-based scores in panel B.

[Please insert tables 4 and 5 about here.]

The *QUALITY* component is significantly negatively related to the spread with a coefficient of -0.023, indicating that stronger past relationships between lenders as well as higher average reputation, market share, importance and experience in the syndicate can diminish the cost of information asymmetries. A higher *HETEROGENEITY* component in the syndicate, either in terms of the number of members, of countries involved or in terms of the discrepancy in past connections, is also related to a lower spread. Although a higher heterogeneity can imply higher information asymmetries within the syndicate, it can also imply that the loan is diffused, as opposed to concentrated among few lenders, indicating that the related information asymmetry premium is more than offset by the reduction in the concentration premium, which is consistent with Ivashina (2009). The positive *LEAD* component coefficient of 0.016 shows that lead arrangers with better reputation, more experience, greater market share and greater importance are associated with higher spreads. Previous relationships with the borrower, which reduce all forms of information asymmetries and are considered in the *RELATIONS* component, are associated with lower spreads. Finally, the *INDUSTRY* component indicates that bank-led syndicates (investment firm-led) are associated with lower (higher) spreads, which is consistent with Harjoto et al. (2006) who find that spreads are lower for commercial bank loans or co-led loans than for investment bank-led loans and with results by Nandy and Shao (2010). The

[9] To formally detect multicollinearity in all the models used in the study, Variable Inflation Factors (VIF) are calculated. None of the VIFs exceed 6.

remaining coefficients are consistent with the literature; larger, more profitable and lower leveraged borrowers are related to lower spreads.

Although the *GEOGRAPHY* component is not significant in Panel B, it may be conditional on the geography of the borrower. To test this hypothesis, the sample is divided into U.S. and non-U.S. borrowers.[10] Results are available in Panels C and D of table 5 and show that the *GEOGRAPHY* component is a significant determinant of spread in both cases, but with opposite effects on the spread. U.S. borrowers pay higher spreads when their lead arranger is from the U.K. or any other country (captured by the *INTERNATIONAL* structure variable) or when their loan is syndicated in Western Europe as opposed to the U.S., while non-U.S. borrowers benefit from an international arranger or from their loan being syndicated in Europe. This is evidence of a domestic bias in the syndicated loan market.

Table 6 shows results for model (1) using the *CONCENTRATION* component. The *CONCENTRATION* coefficient is negative, indicating that larger and less concentrated syndicates are related to lower spreads. In Panels C and D, in which the sample is divided into U.S. and non-U.S. borrowers, results show the U.S. borrowers benefit almost three times as much from bank arrangers than their non-U.S. counterparts (coefficient of -69.27 vs -25.40).

[Please insert table 6 about here.]

3.5 Endogeneity in the syndicate structure and the loan spread

The definition of the appropriate model is more difficult when the structure and the spread are allowed to be endogenously determined. The general form of the structure model examined is the following:

$$STRUCTURE_{j,l} = \beta_0 + \beta_1 \times SPREAD_l + \sum_{i=2}^{n} \beta_i \times STRUCTURE_{i,l} + \sum_{i=n+1}^{N} \beta_i \times X_{i,l} + \varepsilon_l \qquad (2)$$

In model (2), $STRUCTURE_{j,l}$ is either the component score or the weighted factor-score for one of

[10] Results are qualitatively similar with interactive variables that combine the *GEOGRAPHY* component and the country of the borrower, but multicollinearity problems bias the statistic inference.

the syndicate structure components for loan *l* that are endogenous, $STRUCTURE_{i,l}$ is either the component score or the weighted factor-score for one of structure components for loan *l* that are exogenous, and the remaining variables are as defined for model (1). Based on existing theories and the availability of variables, the following set of exogenous variables is used, where the variable definitions are provided in Appendix B:

X(2) = [SIZE, DEBTA, OPAQUE, ECON-DEV, EMERGING, POOL-LENDERS, POOL-LEADS,-FIRST-SYND, FIRST-ALL, INFO-SYND, INFO-ALL, BORROWER-COUNTRY, YEAR]

Because structure variables have mostly been examined separately, there is no consensus as to which structure variable is endogenously determined with the loan spread and which are exogenously determined. Intuitively, because the lead arranger is generally determined by the borrower, we argue that structure variables related to the characteristics of the lead arranger are exogenous. Consequently, we assume that the *LEAD*, *GEOGRAPHY* and *INDUSTRY* components, which are predominantly loaded by lead arranger characteristics, are determined exogenously. Regarding the *RELATIONS* component, although the previous relationships between the borrower and the lenders obviously occur prior to the current loan, evidence shows that lender participation in a syndicate depends on these previous connections (see, for example Sufi, 2007; Champagne and Kryzanowski, 2007). It can therefore be argued that the resulting average relationship between the syndicate members and the borrower is determined when the syndicate is formed and is thus endogenous. Because the *HETEROGENEITY* and *QUALITY* components also depend on the resulting syndicate, they are also assumed to be determined endogenously. In the end, three specifications for model (2) are defined and used in the analysis:

$$QUALITY_l = \beta_0 + \beta_1 \times SPREAD_l + \beta_2 \times LEAD_l + \beta_3 \times GEOGRAPHY_l + \beta_4 \times RELATIONS_l + \beta_5 \times INDUSTRY_l + \sum_{i=6}^{N} \beta_i \times X_{i,l} + \varepsilon_l \quad (2a)$$

$$HETEROGENEITY_l = \beta_0 + \beta_1 \times SPREAD_l + \beta_2 \times GEOGRAPHY_l + \beta_3 \times RELATIONS_l + \beta_4 \times INDUSTRY_l + \sum_{i=5}^{N} \beta_i \times X_{i,l} + \varepsilon_l \quad (2b)$$

$$RELATIONS_l = \beta_0 + \beta_1 \times SPREAD_l + \beta_2 \times GEOGRAPHY_l + \beta_3 \times INDUSTRY_l + \sum_{i=4}^{N} \beta_i \times X_{i,l} + \varepsilon_l \quad (2c)$$

Estimation results for models (1), (2a), (2b) and (2c) using 3SLS and weighted factor-based scores for the components are available in table 7.

[Please insert table 7 about here.]

For the spread model, all the components are significant, with the exception of the *HETEROGENEITY* component. The signs of the relationships between the components and the spread are similar to those using an OLS estimation of model (1). Higher quality syndicates are related to lower spreads. Leads with better reputation, experience, importance and market share are related to higher spreads. The *GEOGRAPHY* component is negative, which means that, on average, borrowers benefit from European syndicates, international or U.K. lead arrangers, everything else held equal, consistent with the European puzzle observed by Carey and Nini (2007). Remaining coefficients are consistent with those of Lee and Mullineaux (2004) discussed in section 2.

Results also provide evidence that some structure components are endogenously determined and related to one another. For instance, the reputation, experience and importance of the lead, captured by *LEAD*, is positively related to the average quality of the entire syndicate, while U.S. lead arrangers and North American syndicated loans are related to higher syndicate quality. Syndicates in which the members have stronger past connections with the borrower are also positively related to the quality of the syndicate. Finally, banks (as opposed to investment

firms) are related to lower quality syndicates.

Estimation results using concentration variables are available in table 8. Interestingly, the loan spread is a significant determinant of the *CONCENTRATION* component but the reverse is not true. *GEOGRAPHY*, *LEAD* and *RELATIONS* are also found to be related to *CONCENTRATION*. Although a bilateral relationship appears to exist between *RELATIONS* and the loan spread, the *GEOGRAPHY* and *INDUSTRY* components are not related to it.

[Please insert table 8 about here.]

4. Syndicate structure and privately placed deals

The second purpose of the paper is to use the structure components identified above to study the impact of information asymmetries on the structure and spread of syndicated loans, conditional on the loan distribution method. There are two common distribution methods for syndicated loans that differ in terms of information asymmetries: traditional syndications and privately placed deals. In the former, the borrower usually approaches a lead arranger who will be the official underwriter of the loan and will be responsible for gathering information about the borrower, analyze the credit risk and subsequently monitor the borrower. The lead arranger will then invite a number of other banks to participate. In a privately placed deal, the borrower specifically requests the presence of each and every member of the syndicate. This fundamental difference in the choice of syndicate members evidently affects the structure of the syndicate, which is related to information asymmetries. Therefore, studying the structure and spread of a syndicated loan conditional on its distribution method can help better understand agency problems within a loan syndicate.

In a typical syndication, the arranger is the only bank to negotiate with the borrower and is thus the best informed regarding the company's financial status. This situation is theoretically different in privately placed deals since the borrower, by requesting specific lenders, determines to some extent the structure of the syndicate. Moreover, since lenders are relatively equally responsible and information about the borrower is typically more similar across syndicate

members, information asymmetries are reduced, everything else held equal. Consequently, because information asymmetries and resulting agency problems are diminished, and since syndicate structure is usually set to address agency problems, privately placed deal structures should differ from traditional syndications' structures. Further, since loan spread is related to the structure of the syndicate, privately placed deal spread is also expected to differ, everything else held equal. Specifically, because the information asymmetry premium in privately placed deals is assumed to be lower than or equal to that in syndications, the spread is expected to be lower.

4.1 Univariate analysis

A univariate comparison of the syndicate structure components, the all-in loan spread and a number of borrower characteristics is performed on two sub-samples according to the distribution method of the loan. Results are available in table 9. The average spread for syndications is 40 bps above the spread for privately placed deals (142.59 vs 102.5 bps). The *HETEROGENEITY* component is significantly higher in syndications than privately placed deals (598.53 vs 476.65), as well as the *LEAD* component (398.98 vs 253.49) and the *RELATIONS* component (29.58 vs 26.85), which implies that privately placed deals are more homogeneous, have arrangers with lower reputation, experience, market share or importance, and lenders have fewer and shorter past relationships with the borrower.

[Please insert table 9 about here.]

Untabulated results show that privately placed deals are less popular in North America than in Asia or Europe. Whereas for syndications, 67.2% of loans are from a U.S. lead, only 18.1% of privately placed deals are arranged by an American lead. Further, while for syndications a majority (70.3%) of loans are syndicated in the US/Canada region, they are mainly split between Asia (46.9%) and Western Europe (35%) for privately placed deals. These statistics are evidenced by the *GEOGRAPHY* component that is almost three times larger for privately placed deals.

These results give preliminary evidence that significant differences in the structure of the syndicate between privately placed deals and syndications, notably for the *HETEROGENEITY*,

LEAD and *GEOGRAPHY* components, can potentially explain the differences between their loan spreads. The following section uses multivariate regressions to formally test these relationships and to control for loan and borrower characteristics.

4.2 Multivariate analysis

Although results in section 3 and in previous studies provide evidence of endogeneity in the determination of syndicate structure and loan spread, those tests are conducted without distinguishing between syndications and privately placed deals. In privately placed deals, the syndicate structure and loan spread are not determined simultaneously but subsequently. Specifically, the syndicate is formed and the terms are negotiated after. Thus, the research strategy adopted herein is to study loan spread and syndicate structure separately. The general form of the model examined is the following:

$$SPREAD_l = \beta_0 + \beta_1 \times CLUB_l + \sum_{i=2}^{7} \beta_i \times STRUCTURE_{i,l} + \sum_{i=8}^{N} \beta_i \times X_{i,l} + \varepsilon_l \quad (3)$$

In model (3), the right-hand side variable $CLUB_l$ is a dummy variable that equals one if the distribution method of loan l is a club deal (privately placed deal) and zero otherwise, $STRUCTURE_{i,l}$ is the weighted factor-based score for one of the six syndicate structure components identified previously and $X_{i,l}$ are borrower-specific, loan-specific and calendar control variables defined in Appendix B.

Results for the OLS estimation of model (3) are available in panels A and B of Table 10 and show that the distribution method is a significant determinant of the loan spread, even after controlling for syndicate structure, loan and borrower characteristics. Specifically, the coefficient for *CLUB* is significantly negative, indicating a lower spread of approximately 21 bps for privately placed deals as opposed to syndications.

[Please insert table 10 about here.]

4.3 Conditional effect

Although these results may indicate that club deals have unique characteristics not captured

by the structure components or any of the control variables, it may also mean that the structure of the club deal or its loan-specific characteristics are intrinsically different in their relationship to the spread. Syndications are often structured in a way to address information asymmetries among lenders. In a privately placed deal, because information asymmetries are reduced, this agency-reducing role of the syndicate is not as fundamental. As a consequence, the resulting syndicate components are differently related to both the concentration and information asymmetry premiums. To test whether the impact of structure components are function of the distribution method, we use a conditional model. Specifically, instead of it as a fixed parameter in (3), namely β_1, the loan spread difference attributable to club deals can be conditionally defined as a linear function of the $STRUCTURE_{i,l}$ and $X_{i,l}$ variables specifically related to club deal loans as follows[11]:

$$\beta_{1,l}(STRUCTURE_{i,l}, X_{i,l}) = \beta_{CLUB1} + \sum_{i=2}^{7} \beta_{CLUBi} \cdot Structure_{i,l} + \sum_{i=8}^{N} \beta_{CLUBi} \cdot x_{i,l} \quad (4)$$

Where $Structure_{i,l}$ and $x_{i,l}$ are respectively the zero mean *STRUCTURE* and *X* variables, such as $Structure_{i,l} = STRUCTURE_{i,l} - \overline{STRUCTURE}$ and $x_{i,l} = X_{i,l} - \overline{X_l}$. Thus, the constant β_{CLUB1} represents the conditional average of the loan spread difference when specific club deal explanatory variables are included in the model. By replacing β_1 in (3) with the function $\beta_{1,l}\ STRUCTURE_{i,l}, X_{i,l}$, the general form of the conditional model is:

$$\begin{aligned} SPREAD_l = {} & \beta_0 + \beta_{CLUB1} \cdot CLUB_l + \sum_{i=2}^{7} \beta_{CLUBi} \cdot \left[Structure_{i,l} \otimes CLUB_l \right] + \\ & \sum_{i=8}^{N+1} \beta_{CLUBi} \cdot \left[x_{i,l} \otimes CLUB_l \right] + \sum_{j=1}^{6} \beta_j \cdot STRUCTURE_{i,l} + \sum_{j=7}^{N} \beta_j \cdot X_{j,l} + \varepsilon_l \end{aligned} \quad (5)$$

Where $\otimes$ is the Kronecker product that multiplies two vectors together, element by element. In this context, the parameter β_{CLUB1} measures the average conditional loan spread difference related to club deal structure variables $\left[Structure_{i,l} \otimes CLUB_l \right]$ and other club deal explanatory variables

[11]This conditional framework follows the conditional beta estimation proposed by Ferson and Schadt (1996).

$\left[x_{i,l} \otimes CLUB_l \right]$.

Results from the conditioning of structure and loan-specific variables on the distribution method are available in Panel C of table 10. The coefficient for $CLUB_l$ is no longer significantly different from zero, implying that intrinsic differences in syndicate structure and/or control variables for privately placed deals affect the spread differently. An analysis of the structure components conditional on the loan being distributed via a privately placed deal shows that the *GEOGRAPHY* and *RELATIONS* components are mainly responsible for the observed spread difference between distribution methods, while the *HETEROGENEITY* and *LEAD* components are also significant but to a lesser extent. Thus, the unconditional spread originally observed between the two distribution methods seems to be explained, in a conditional framework, by specific loan structure components for club deals that decrease asymmetric costs typically related to syndicated loans.

4.4 Selection bias of the distribution method and propensity score matching

Although the determination of the syndicate structure in the case of a privately placed deal is likely prior to the determination of the loan spread and terms, it is not clear when the decision to distribute the loan via a privately placed deal is made and, more importantly, how it relates to the syndicate structure. Intuitively, borrowers invite lenders to form a club deal when they believe the resulting syndicate is optimal. Consequently, we assume that syndicate structure is a determinant in the decision to distribute the loan via a privately placed deal. This context generates a selection bias that makes the comparison of the spread and structure for privately placed deals and syndications problematic.

Because we can't observe the spread for the same borrower under two mutually exclusive treatments (i.e. distribution methods), we have a missing data problem. Using matching model terminology, we can assess the effect of a treatment only if we know what would have happened without the treatment. To make causal inferences, random selection of subjects and random

allocation of the treatment to subjects is required but not possible in this case because historical data is used. Without randomization, causal inferences cannot be made because it's not possible to determine whether the difference in outcome (e.g. loan spread) between the treated and control subjects is due to the treatment or differences between subjects on other characteristics (e.g. borrower or loan characteristics). Subjects or companies with certain characteristics may be more likely to be associated with a club deal than others, thus introducing a selection bias. A propensity score matching approach is used to control for the selection bias induced by the distribution method.[12]

Propensity score matching (PSM), introduced by Rosenbaum and Rubin (1983) and developed by Heckman et al. (1997, 1998), among others, has become a popular approach to estimate treatment effects of economic programs or medical procedures. According to Rosenbaum and Rubin (1983), the estimated propensity score, $e(x_i)$, for subject i,(i = 1,…, N) is the conditional probability of being assigned to a particular treatment given a vector of observed covariates x_i:

$$e(x_i) = \Pr(z_i = 1 | x_i) \tag{6}$$

and

$$\Pr(z_1, ..., z_n | x_1, ..., x_n) = \prod_{i=1}^{N} e(x_i)^{z_i} \{1 - e(x_i)\}^{1-z_i} \tag{7}$$

where $z_i = 1$ for treatment observations (i.e. club deal distribution method), $z_i = 0$ for control observations and x_i is the vector of observed covariates for the i^{th} subject. The idea behind propensity score matching stems from the automatic control for the observed variables when a treated and control subjects have the same propensity score. In that case, any difference between the two groups will be accounted for and not be as a result of the observed variables. A logistic

[12] The authors would like to thank an anonymous reviewer from the Northern Finance Association meeting for suggesting matching models to address the selection bias.

regression is used to estimate the probability that an event occurs:

$$\ln\left[\frac{e(x_i)}{1-e(x_i)}\right]=\ln\left[\frac{\Pr(z_i=1|x_i)}{1-\Pr(z_i=1|x_i)}\right]=\alpha+\beta^T x_i \quad (8)$$

It follows that

$$e(X_i)=\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+...+\beta_i X \quad (9)$$

In (6), (7), (8) and (9), β_0 is the intercept, β_i is the regression coefficient, X_i, the treatment variables and covariates and x_i, the observed value of variables.

In our case, the difficulty resides in the determination of equation (9) where X_i can be thought of as a vector of structure, borrower and loan characteristics that affects the decision to form a club deal. To our knowledge, no study has yet examined the determinants of the distribution method. It seems logical to assume that borrowers will be involved in a syndication when, after deciding to use private financing (as opposed to public financing such as bonds), they mandate a lender who then makes the decision regarding the need to syndicate (e.g. to diversify) or not. However, the decision for the loan to be syndicated does not belong to the borrower. Club deals, on the other hand, can be requested (at least partly) by borrowers for a number of reasons, including the intrinsic syndicate structure.

Based on our intuition and the literature on the characteristics of syndicated loan borrowers, we identify a number of explanatory variables that can explain the decision to form a privately placed deal. As mentioned above, we argue that the decision to be distributed via a club deal depends, among other things, on the structure of the syndicate that would be formed and assumed to be optimal. Since the six structure components are not all known a priori in the case of syndications, we only consider exogenously-determined components as explanatory variables for the probability of having a privately placed deal. The following logistic model for the

likelihood that a club deal is formed (*CLUB*) is used as a representation of equation (9) to estimate propensity scores:[13]

$$CLUB_l = \beta_0 + \sum_{i=1}^{3} \beta_i \times STRUCTURE_{i,l} + \sum_{4}^{N} \beta_i \times X_i + \varepsilon \quad (10)$$

where the exogenous variables are defined in Appendix B and $STRUCTURE_i$ are the three structure components that are assumed to be exogenously determined for all syndicated loans: *LEAD*, *GEOGRAPHY* and *INDUSTRY*. Coefficients and odds ratios for the different covariates are available in Table 11. Results show that larger borrowers have a higher probability of being in a club deal, as are opaque borrowers. The number of past privately placed deals is positively related to the probability of forming a club deal. Past relationships with syndicate lenders increase the chances of a club deal while past relationships with leads decrease these odds. As expected, geography is an important determinant of the distribution method, both in terms of syndicate structure and borrower country. Asian borrowers have more than twice the odds of forming a club deal while European borrowers are more than 4 times more likely to be in a club deal. Borrowers from emerging economies are almost three times mores likely to form a club deal. The lower the syndicate potential of the borrower (see Dennis and Mullineaux, 2000), the higher the likelihood of being distributed as a club deal, which is evidenced by the negative coefficient for *MTY*.

[Please insert table 11 about here.]

Once the propensity scores have been estimated, treated subjects can be matched with subjects that have the same/similar propensity score but did not receive treatment. The unmatched subjects are discarded from the analysis. There is no one matching method that has been deemed to be effective in every circumstance. For comparison and robustness, four different matching methods are used: kernel matching, local linear regression (LLR) matching and nearest k-

[13] It's important to note that the logit model does not characterize the choice between club deals and syndications, since the latter are not decided by the borrower. Further, unlike the model by Dennis & Mullineaux (2000), it is not a modelisation of syndicated vs non-syndicated loans since all the loans in the sample are syndicated.

neighbour matching with 2 and 3 neighbours, respectively.

With the nearest k-neighbour matching algorithm, the absolute difference between the estimated propensity scores for the control and treatment groups is minimized. The control and treatment subjects are randomly ordered and the first treated subject is selected along with N control subjects with propensity scores closest in value to it: $C(P_i) = \min_j | P_i - P_j |$ where $C(P_i)$ represents the group of control subjects *j* matched to treated subjects *i* (on the estimated propensity score), P_i is the estimated propensity score for the treated subjects *i* and P_j is the estimated propensity score for the control subjects *j*. With kernel matching, every treated subject is matched with the weighted average of the control subjects. The weights are inversely proportional to the distance between the treated and the control group's propensity scores. Local linear regression matching is a version of kernel matching where the weights are found with a linear regression. The four matching methods can incorporate the caliper matching method in which a pre-determined range of values is defined usually within one-quarter of the standard error (0.25σ) of the estimated propensity. Any values that fall outside that range are removed (Cochran and Rubin, 1973). The range is $| P_i - P_j | < \varepsilon$ where P_i is the estimated propensity score for the treated subjects *i*, P_j is the estimated propensity score for the control subjects *j* and ε is the pre-determined range of values.

For all four matching methods, common support is imposed by dropping treatment observations whose propensity score is higher than the maximum or less than the minimum propensity score of the controls. Since the control data set is quite large, matching is done without replacement when applicable.[14] Sensitivity analyses are also performed by changing the bandwidth or trimming the treatment observations at which the propensity score density of the control observations is the lowest.

[14] Results are similar with replacement.

Table 12 summarizes the average values for different outcome variables related to the loan cost and the syndicate structure for the four matching methods. For each outcome variable, the average for the unmatched sample and the average treatment effect on the treated (ATT) are measured. Panels A to D give the results using the kernel, the LLR matching method and k-neighbour matching with 2 and 3 neighbours, respectively. Because the standard errors are smaller with the kernel matching method, results in Panel A will be analyzed in more details. Without matching, the average spread difference is 40.01 bps smaller for privately placed deals. Using kernel matching, spreads are no longer significantly lower for privately placed deals (than syndications). Results for loan spreads are robust to sensitivity analyses.[15] Part of the impact of the distribution method can therefore be attributable to the intrinsic structure and borrower characteristics that differ between the two types of deals.

[Please insert table 12 about here.]

Even after matching on structure, loan-specific and borrower-specific variables that can generate a selection bias, the remaining structure components are significantly different between privately placed deals and syndications. The difference in *QUALITY* and *HETEROGENEITY* between the two groups is even larger after matching. *QUALITY* is more than 82.83 units higher in privately placed deals, while *HETEROGENEITY* is 132.36 lower in privately placed deals. Interestingly, while the unmatched sample shows a higher *RELATIONS* component for syndications, the opposite sign is found after matching on propensity scores. Results in terms of the significance of the treatment (i.e. privately placed deal) on different outcomes are similar for the four matching methods. The magnitude of the differences can differ according to the matching technique. Overall, the matching approach support the fact that privately placed deals are structured differently from traditional syndications and that the difference in spread between the two distribution methods is attributable to intrinsic structure and borrower characteristics.

[15] Sensitivity analyses are also conducted on the remaining outcome variables with similar results.

5. Conclusion

This paper is the first comprehensive study on all aspects of a syndicate structure. We start with an exhaustive set of 40 structure-related variables and use principal component analysis to identify six principal components of the syndicate structure, thereby providing a new approach to characterize and quantify the multidimensional structure of a syndicate. The six components can be interpreted as the quality of the syndicate, the heterogeneity of its members, the characteristics of the lead arranger, the geography of the syndication and its lead arranger, the average relations between the borrower and the syndicate members, and the lender industry.

Re-examining the impact of syndicate structure on the loan spread using multivariate regressions, the six structure components are found to be significant determinants of the loan spread, supporting prior studies and providing evidence that more than one or two structure variables are necessary to fully capture the effect of syndicate structure on the spread. Further, results show that some of the structure components are endogenously determined.

This paper also compares the syndicate structure and the cost for two distribution methods that differ in terms of information asymmetries: syndications and privately placed deals. Syndications are often structured in a way to address information asymmetries among lenders. In a club deal, because information asymmetries are reduced, the syndicate can be structured differently and optimally from the borrower's point of view. In a multivariate regression setting, the paper shows that privately placed deals are related to lower spreads by as much as 21.5, even after controlling for borrower and loan characteristics. Using conditional methods and matching models, it is also demonstrated that the lower spread can be explained by an intrinsically different syndicate structure for privately placed deals.

Overall, results highlight the question of whether or not there is an optimal syndicate structure to benefit the borrowers. If syndicates can shift costs to borrowers, the structure of syndicates must be irrelevant to lenders. However, it's not irrelevant in the market and for borrowers.

Appendix A – Definitions of syndicate structure variables

This appendix describes the different syndicate structure variables used in the principal component analysis. Unless otherwise mentioned, variables are either from Dealscan (loan terms, syndicate structure, and lenders) or from Compustat Global (borrower characteristics).

Variable	**Definition**
LENDERS	Total number of distinct lenders in the syndicate.
LEADS	Total number of lead arrangers in the syndicate. Lenders are considered in the lead arranger category if they get lead arranger credit from Dealscan.
PARTICIPANTS	Total number of participants (non lead) in the syndicate.
LEAD EXPOSURE	Ratio of the total loan amount to the lead arranger's assets
HH-INDEX	Herfindahl-Hirschman index as measured by the sum of the squares of the loan share of each individual lender in the syndicate at loan origination.
LEAD-SHARE	Share of the loan retained by the lead arranger at loan origination. If there is more than one lead arranger, it is the total sum of shares they detain.
TOP3-SHARE	Sum of share held by the lenders with the 3 largest shares at loan origination.
REL-LENDERS	Average number of past loans in the 5-year period prior to the deal active date with each lender in the syndicate
REL-LEAD	Average number of past loans in the 5-year period prior to the deal active date with the lead arranger(s).
DURATION-LENDERS	Average length of relationship between the borrower and each lender in the syndicate, measured in number of months between the first deal and current deal active date,
DURATION-LEAD	Length of relationship between borrower and lead arranger, measured in number of months since first deal.
INTERNATIONAL	One if the borrower is from the same country as the lead arrangery, 0 otherwise
INDUSTRIES	Total number of distinct industries (within the financial sector) represented by members of the syndicate (e.g. if the syndicate involves only commercial banks, then the variable is equal to 1; if the syndicate involves commercial banks and insurance companies, then the variable is equal to 2). Industries are grouped into five categories: banks, insurance companies, investment banks, funds and other. The variable proxies for syndicate heterogeneity.
LEAD-BANK	One if the main lead arranger is a bank, 0 otherwise. If there is more than one lead arranger for the deal, the main lead arranger is identified as the one with the largest share. When lender share is not available, the main lead bank is identified with the lender role within the syndicate.
LEAD-INVEST	One if the main lead arranger is an investment firm, 0 otherwise.
COUNTRIES	Total number of distinct countries represented by the members of the syndicate (e.g. if the syndicate involves only U.S. lenders, then the variable is equal to 1; if the syndicate involves lenders from the U.S. and U.K., then the variable is equal to 2). The variable proxies for syndicate heterogeneity.
REPUTATION-LEAD	Inverse of the lead arranger's ranking in terms of league table credit during the previous year.

MARKETSHARE-LEAD	Ratio of the total amount of loans arranged by the lead arranger in the previous year to the total volume of loans arranged in the previous year.
IMPORTANCE-LEAD	Inverse of the lead arranger's ranking in terms of volume. If there is more than 1 lead arranger for the deal, the lead arranger with the best ranking is taken.
EXPERIENCE-LEAD	Total number of loans arranged by the lead arranger in the previous year.
INTENSITY-SYND	Average number of past common deals in the 5-year period prior to the deal active date between each pair of lender in the syndicate.
DURATION-SYND	Average length of relationship between all the pairs of lenders in the syndicate, measured in number of months between the first common deal and current deal active date.
REPUTATION-SYND	Average of the inverse rankings of syndicate lenders in terms of league table credit during the previous year.
MARKETSHARE-SYND	Average market shares (measured by the ratio of total amount of loans by the lender in the previous year to the total volume of loans arranged in the previous year) of syndicate lenders.
IMPORTANCE-SYND	Average of the inverse rankings of syndicate lenders in terms of volume during the previous year.
EXPERIENCE-SYND	Average number of deals by syndicate lenders in the previous year.
ASYMMETRY-INTENSITY	Range in the number of past common deals in the 5-year period prior to the deal active date between each pair of lender in the syndicate.
ASYMMETRY-DURATION	Range in the length of relationship between all the pairs of lenders in the syndicate (measured in number of months)
ASYMMETRY-REPUTATION	Range in the inverse rankings of syndicate lenders in terms of league table credit during the previous year.
ASYMMETRY-MARKETSHARE	Range in the market shares of syndicate lenders during the previous year.
ASYMMETRY-IMPORTANCE	Range in the inverse rankings of syndicate lenders in terms of volume during the previous year.
ASYMMETRY-EXPERIENCE	Range in the number of deals by syndicate lenders in the previous year.
LEAD- COUNTRY	One if the main lead arranger is from a specific country, 0 otherwise. Three countries are considered: U.S. *(LEAD-US)*, Japan (*LEAD-JAPAN*) and U.K. (*LEAD-UK*).
SYND-REGION	Set of five dummy variables used to capture where the syndicate is arranged. The regional dummies are for US & CANADA (SYND-*US-CA*), Latin America (SYND-*LAT-AMERICA*), Western Europe (SYND-*EUROPE*), Africa and Middle East (SYND-*AFRICA-EAST*) and Asia/Pacific (SYND-*ASIA*).

Appendix B – Definitions of control variables used in the multivariate models analysis

This appendix describes the different structure variables used in the multivariate models. The variables are divided into two different categories: i) borrower-specific variables and ii) loan-specific variables. Unless otherwise mentioned, variables are either from Dealscan (loan terms, syndicate structure, and lenders) or from Compustat Global (borrower characteristics).

i) Borrower-specific variables:

Variable	**Definition**
SIZE	Log of the inflation-adjusted U.S. dollar book value of the assets of the borrower observed at the nearest date before the loan active date and is adjusted using the Consumer Price Index (CPI).
RELAMT	Ratio of the loan amount to borrower size.
LEVERAGE	Borrower's debt-to-equity ratio observed at the nearest date before the loan active date.
PROFIT	Borrower's return on equity (ROE) observed at the nearest date before the loan active date.
OPAQUE	One if the borrower is unrated, 0 otherwise.
ECONDEV	Borrower's home country's level of economic development as measured by the per capita GNP obtained from the International Monetary Fund.
EMERGING	One if the borrower's home country is considered to be emerging, 0 otherwise. Identification of emerging countries is from the International Monetary Fund.
LEGAL	One if the borrower's home country's legal system is civil law, 0 if common law. To facilitate the interpretation of the coefficients and to limit the number of dummy variables, countries that are categorized as socialist countries are removed from these tests.
POOL-LENDERS	Number of distinct lenders that were involved in loans with the borrower in the previous five years.
POOL-LEADS	Number of distinct lead arrangers that were involved in loans with the borrower in the previous five years.
FIRST-SYND	One if the borrower is tapping the syndicated loan market for the first time, 0 otherwise.
FIRST-ALL	One if the borrower has never borrowed through any distribution method recorded in the LPC database, in the five-year period prior to the deal active date, 0 otherwise
INFO -SYNDICATION	Number of times that the borrower has borrowed on the syndicated loan market through syndications during the five-year period prior to the active date of the deal (based only on the entries in the LPC database).
INFO-ALL	Number of times that the borrower has borrowed through any distribution method recorded in the LPC database, in the five-year period prior to the deal active date.
REL-LENDER-DUMMY	One if the borrower has borrowed from at least one lender in the syndicate in the five years prior to the deal, 0 otherwise.
REL-LEAD-DUMMY	One if the borrower has borrowed from the lead arranger in the five years prior to the deal, 0 otherwise.
INDUSTRY	Set of eight dummy variables based on the four-digit SIC code classification of the borrower's industry: agriculture, forestry and fishing, construction, finance, insurance and real estate, manufacturing, mining, retail trade, services, and transportation, communications, etc. Robustness tests using a sub-sample of non-financial borrowers yield similar results.

ii) Loan-specific variables:

Variable	**Definition**
SPREAD	Total (fees and interest) annual spread paid over LIBOR for each dollar drawn down from the loan net of upfront fees.
MTY	Natural logarithm of the maturity of the loan as measured by the number of months until loan expiration.
AMT	Natural logarithm of the deal amount in U.S. dollars adjusted for inflation using the CPI between 1994 and 2009. In the case of multiple-facilities deals, *AMT*, *MTY*, *TYPE* and *PURPOSE* take the values corresponding to the facility with the largest amount.
TRANCHES	Number of tranches in the deal.
MULT-TRANCHE	One if the deal includes more than one tranche (or facility), 0 otherwise.
SECURED	One if the loan is secured, 0 otherwise.
COVENANT	One if the loan has special covenants, 0 otherwise.
SENIOR	One if the loan is senior, 0 otherwise.
TYPE	Set of five distinct binary variables to account for the following loan types: 364-day facility, floating rate note, letter of credit, term loan and revolver/line of credit. The remaining facilities are grouped into another class and serve as the control variable.
PURPOSE	Set of five dummy variables designed to capture the following loan purposes: recapitalization, acquisitions, working capital, debt restructuring and other purposes. The general corporate purpose category serves as the control group.
YEAR	Set of indicator variables to control for general trends in the market over the 1994-2009 period.

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Figure 1 – Distribution methods according to their theoretical concentration and information asymmetry premiums

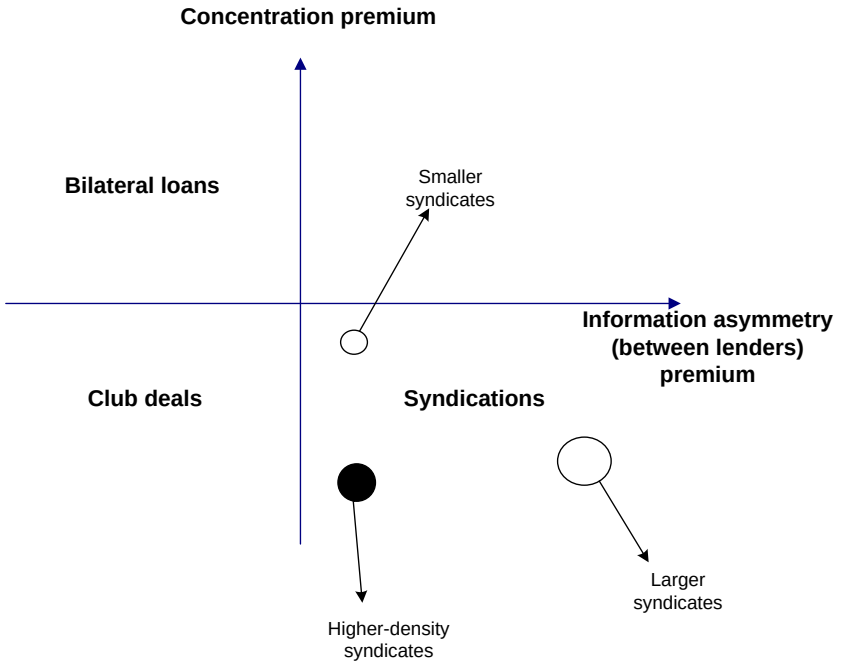

Table 1. Descriptive statistics for the syndicate structure variables

This table presents summary statistics for the 40 different variables described in Appendix A and used in the principal component analysis in section 3 of the paper, as well as their correlation with the loan spread. N is the sample size.

Variable	N	Mean	Std Dev	Min	Max	Correlation with *SPREAD*
LENDERS	20336	10.8973	9.18	2.00	141.00	-0.195
LEADS	20336	1.9820	2.41	0.00	37.00	-0.101
PARTICIPANTS	20336	8.9154	8.99	0.00	140.00	-0.172
LEAD EXPOSURE	11994	0.0268	0.48	0.00	20.54	0.045
HH INDEX	7718	0.1893	0.16	0.01	1.00	0.331
LEAD SHARE	7357	36.1096	26.99	0.00	100.00	0.121
TOP3	7718	53.9565	27.38	6.36	103.65	0.336
REL-LENDERS	20336	1.2711	1.37	0.00	26.00	-0.113
REL-LEAD	20336	1.8916	2.59	0.00	168.00	-0.079
DURATION LENDERS	20336	17.0015	19.55	0.00	174.50	-0.152
DURATION LEADS	20336	23.4677	32.76	0.00	264.00	-0.117
INTERNATIONAL	20336	0.2432	0.43	0.00	1.00	-0.030
INDUSTRIES	20336	1.6527	0.78	1.00	5.00	0.191
LEAD-BANK	20336	0.8969	0.30	0.00	1.00	-0.223
LEAD-INVEST	20336	0.0479	0.21	0.00	1.00	0.151
COUNTRIES	20336	3.9597	3.17	1.00	30.00	-0.247
REPUTATION-LEAD	20336	0.2074	0.33	0.00	1.00	-0.046
MARKETSHARE-LEAD	20336	0.0113	0.01	0.00	0.04	-0.062
IMPORTANCE-LEAD	20336	0.1600	0.26	0.00	1.00	-0.043
EXPERIENCE-LEAD	20336	478.5633	466.92	1.00	1811.00	-0.042
INTENSITY-SYND	20336	132.9382	150.85	0.00	1874.00	-0.148
DURATION-SYND	20336	70.2041	38.83	0.00	297.00	-0.153
REPUTATION-SYND	20336	0.0845	0.09	0.00	1.00	-0.063
MARKETSHARE-SYND	20336	0.0072	0.00	0.00	0.03	-0.143
IMPORTANCE-SYND	20336	0.0788	0.09	0.00	0.75	-0.099
EXPERIENCE-SYND	20336	301.3252	191.73	1.00	1431.00	-0.091
ASYMMETRY-INTENSITY	20336	643.3279	530.41	0.00	1988.00	-0.198
ASYMMETRY-DURATION	20336	159.3518	84.11	0.00	323.00	-0.151
ASYMMETRY-REPUTATION	20336	0.4312	0.41	0.00	1.00	-0.140
ASYMMETRY-MARKETSHARE	20336	0.0181	0.01	0.00	0.04	-0.136
ASYMMETRY-IMPORTANCE	20336	0.3914	0.38	0.00	1.00	-0.172
ASYMMETRY-EXPERIENCE	20336	803.8002	507.53	0.00	1810.00	-0.121
LEAD-US	20336	0.6573	0.47	0.00	1.00	0.098
LEAD-JAPAN	20336	0.0278	0.16	0.00	1.00	-0.071
LEAD-UK	20336	0.0498	0.22	0.00	1.00	-0.013
SYND-US-CA	20336	0.6851	0.46	0.00	1.00	0.157
SYND-LATAMERICA	20336	0.0097	0.10	0.00	1.00	0.026
SYND-WESTEUROPE	20336	0.1202	0.33	0.00	1.00	-0.044
SYND-AFRICA-MIDDLE	20336	0.0088	0.09	0.00	1.00	-0.039
SYND-ASIA	20336	0.1663	0.37	0.00	1.00	-0.157

Table 2. Principal component analysis of the structure variables

This table summarizes the results for the principal component analysis (PCA), on the subset of 36 structure variables performed in section 3 of the paper. PCA is performed on the correlation matrix. Number of observations is 20,336.

	Eigenvalue	Difference	Proportion of variance	Cumulative
1	9.1948	4.867	25.54%	25.54%
2	4.3279	1.345	12.02%	37.56%
3	2.9832	0.627	8.29%	45.85%
4	2.3564	0.372	6.55%	52.40%
5	1.9840	0.467	5.51%	57.91%
6	1.5170	0.101	4.21%	62.12%
7	1.4163	0.242	3.93%	66.05%
8	1.1738	0.066	3.26%	69.32%
9	1.1079	0.051	3.08%	72.39%
10	1.0573	0.031	2.94%	75.33%
11	1.0264	0.123	2.85%	78.18%
12	0.9037	0.116	2.51%	80.69%
13	0.7881	0.043	2.19%	82.88%
14	0.7446	0.099	2.07%	84.95%
15	0.6457	0.006	1.79%	86.74%
16	0.6398	0.068	1.78%	88.52%
17	0.5715	0.017	1.59%	90.11%
18	0.5548	0.180	1.54%	91.65%
19	0.3750	0.037	1.04%	92.69%
20	0.3380	0.020	0.94%	93.63%
21	0.3184	0.048	0.88%	94.51%
22	0.2704	0.013	0.75%	95.26%
23	0.2572	0.015	0.71%	95.98%
24	0.2421	0.041	0.67%	96.65%
25	0.2013	0.014	0.56%	97.21%
26	0.1871	0.003	0.52%	97.73%
27	0.1843	0.025	0.51%	98.24%
28	0.1596	0.026	0.44%	98.68%
29	0.1333	0.022	0.37%	99.05%
30	0.1114	0.023	0.31%	99.36%
31	0.0879	0.017	0.24%	99.61%
32	0.0706	0.042	0.20%	99.80%
33	0.0287	0.007	0.08%	99.88%
34	0.0221	0.003	0.06%	99.95%
35	0.0195	0.020	0.05%	100.00%
36	0.0000		0.00%	100.00%

Table 3. Rotated factor patterns for the six structure components

This table summarizes the rotated factor patterns for the six structure components retained in section 3 of the paper. Rotation is performed with varimax. Panel A presents the rotated factor patterns on the subset of 36 structure variables using the variables as defined in Appendix A and measured in table 1. Panel B presents the rotated factor patterns on the subset of 36 structure variables after transforming the measures into quintiles for each variable to make the units uniform. Panel C presents the rotated factor patterns for the entire set of 40 structure variables, including concentration variables, using the variables as they are defined in Appendix A and measured in table 1. In Panels A to C, variables with a loading greater than |0.40| for a specific component are shaded in grey. In Panel A, variables that meaningfully load on a particular component and not on any other are bolded. Number of observations is 20,336 for Panels A and B, and 7,718 for Panel C.

	Panel A: Rotated factor patterns (36 structure variables)						**Panel B: Rotated factor patterns on quantiles (36 structure variables)**					
	1	2	3	4	5	6	1	2	3	4	5	6
LENDERS	-0.241	**0.840**	0.062	-0.120	0.050	-0.050	-0.062	0.912	0.026	0.128	0.071	-0.054
LEADS	-0.002	0.165	-0.061	**-0.580**	0.103	0.129	0.030	0.151	-0.137	0.628	0.152	0.099
PARTICIPANTS	-0.246	**0.814**	0.080	0.033	0.024	-0.086	-0.077	0.892	0.069	-0.042	0.029	-0.071
REL-LENDERS	0.193	0.065	0.012	0.059	**0.788**	0.009	0.175	0.073	0.053	-0.122	0.869	0.014
REL-LEAD	0.034	0.145	0.057	0.104	**0.711**	-0.007	0.114	0.174	0.088	-0.144	0.843	-0.003
DURATION LENDERS	0.328	0.109	-0.053	0.071	**0.723**	-0.120	0.246	0.105	0.037	-0.066	0.840	-0.038
DURATION LEADS	0.164	0.138	0.104	0.101	**0.633**	-0.149	0.122	0.085	0.184	0.013	0.799	-0.056
INTERNATIONAL	0.011	0.075	-0.048	**-0.671**	-0.162	0.022	-0.046	0.044	0.073	0.707	-0.084	0.056
INDUSTRIES	-0.232	0.460	0.065	0.154	0.024	0.441	-0.172	0.476	0.070	-0.118	0.065	0.475
LEAD-BANK	0.073	0.063	0.178	-0.061	0.079	**-0.839**	0.119	0.082	0.193	0.010	0.033	-0.829
LEAD-INVEST	0.041	0.014	-0.110	0.036	-0.076	**0.837**	-0.018	-0.056	-0.026	0.045	0.001	0.855
COUNTRIES	-0.059	**0.747**	-0.016	-0.395	-0.017	-0.042	0.084	0.723	0.067	0.389	0.034	0.015
REPUTATION-LEAD	0.181	0.133	**0.851**	0.216	0.052	-0.081	0.279	0.113	0.868	-0.101	0.094	-0.076
MARKETSHARE-LEAD	0.346	0.229	**0.769**	0.043	-0.028	-0.128	0.341	0.119	0.899	0.024	0.070	-0.028
IMPORTANCE-LEAD	0.240	0.130	**0.779**	0.059	-0.087	-0.123	0.337	0.116	0.901	0.019	0.063	-0.028
EXPERIENCE-LEAD	0.278	0.170	**0.824**	0.124	0.088	-0.077	0.322	0.104	0.871	-0.032	0.104	-0.097
INTENSITY-SYND	**0.789**	-0.084	0.150	0.023	0.230	-0.050	0.841	0.026	0.139	-0.059	0.187	-0.091
DURATION-SYND	**0.609**	0.014	-0.030	0.062	0.227	-0.136	0.609	-0.047	-0.027	-0.065	0.192	-0.132
REPUTATION-SYND	0.732	-0.104	0.411	0.138	0.117	0.050	0.811	0.078	0.317	-0.170	0.106	-0.012
MARKETSHARE-SYND	**0.882**	0.112	0.206	0.028	0.037	-0.050	0.852	0.010	0.283	0.005	0.073	0.006
IMPORTANCE-SYND	**0.798**	0.006	0.306	-0.019	-0.017	-0.017	0.847	0.150	0.293	0.021	0.049	0.019
EXPERIENCE-SYND	**0.843**	0.036	0.289	0.079	0.178	0.049	0.859	-0.001	0.243	-0.086	0.147	0.026
ASYMMETRY-INTENSITY	0.358	**0.706**	0.219	0.004	0.222	0.038	0.555	0.660	0.141	-0.006	0.160	-0.003
ASYMMETRY-DURATION	0.087	**0.761**	0.042	-0.074	0.154	0.033	0.288	0.740	0.012	0.061	0.147	0.047
ASYMMETRY-REPUTATION	0.451	0.480	0.477	0.197	0.164	0.038	0.603	0.518	0.317	-0.171	0.101	0.001
ASYMMETRY-MARKETSHARE	0.436	0.693	0.301	-0.021	0.021	0.038	0.583	0.614	0.230	0.044	0.030	0.052
ASYMMETRY-IMPORTANCE	0.473	0.565	0.327	-0.050	-0.002	-0.020	0.634	0.548	0.272	0.031	0.031	0.032
ASYMMETRY-EXPERIENCE	0.419	0.589	0.367	0.037	0.176	0.114	0.608	0.537	0.209	-0.051	0.109	0.055
LEAD-US	0.226	0.170	0.121	**0.792**	0.015	0.121	0.235	0.074	0.210	-0.758	0.051	0.239
LEAD-JAPAN	-0.211	-0.226	0.228	-0.288	0.208	0.123	-0.139	-0.082	-0.013	0.167	0.044	-0.194
LEAD-UK	0.125	0.048	-0.090	**-0.404**	-0.122	-0.133	0.040	-0.036	0.083	0.481	-0.008	0.010
SYND-US-CA	0.235	0.111	0.062	**0.875**	0.094	0.001	0.230	0.017	0.193	-0.840	0.125	0.126
SYND-LATAMERICA	0.016	0.016	0.042	-0.099	-0.121	-0.033	0.005	0.030	0.061	0.102	-0.108	-0.025
SYND-WESTEUROPE	0.172	0.185	-0.173	**-0.518**	-0.316	-0.085	0.096	0.051	0.046	0.621	-0.170	0.116
SYND-AFRICA-MIDDLE	-0.014	0.054	-0.013	-0.165	-0.045	-0.022	-0.024	0.053	0.003	0.148	-0.045	-0.029
SYND-ASIA	-0.440	-0.323	0.068	-0.543	0.212	0.087	-0.361	-0.094	-0.300	0.413	0.041	-0.246

Table 3 (cont'd). Rotated factor patterns for the six structure components

	Panel C: Rotated factor patterns (40 structure variables)					
	1	2	3	4	5	6
LENDERS	-0.058	0.876	0.132	0.053	0.057	0.099
LEADS	0.000	0.135	0.693	0.011	0.089	0.261
PARTICIPANTS	-0.060	0.863	-0.123	0.051	0.026	0.005
LEAD EXPOSURE	0.008	0.001	-0.052	-0.078	0.010	-0.017
HH INDEX	0.025	-0.804	-0.078	0.028	-0.079	0.129
LEAD SHARE	0.003	-0.571	0.563	0.009	0.017	0.269
TOP3 SHARE	0.016	-0.897	-0.121	0.014	-0.086	0.041
REL-LENDERS	0.108	0.122	0.009	-0.001	0.777	0.039
REL-LEAD	-0.009	0.136	-0.049	0.022	0.644	0.011
DURATION LENDERS	0.247	0.087	-0.064	-0.030	0.767	-0.062
DURATION LEADS	0.131	0.084	-0.068	0.165	0.655	-0.098
INTERNATIONAL	-0.047	0.107	0.667	0.075	-0.082	-0.020
INDUSTRIES	-0.078	0.451	-0.128	0.099	0.043	0.488
LEAD-BANK	0.076	0.039	-0.006	0.119	0.050	-0.809
LEAD-INVEST	0.034	0.014	-0.037	-0.059	-0.066	0.781
COUNTRIES	0.032	0.717	0.434	0.026	-0.001	0.104
REPUTATION-LEAD	0.234	0.063	-0.229	0.828	0.113	-0.044
MARKETSHARE-LEAD	0.364	0.138	-0.026	0.813	0.000	-0.132
IMPORTANCE-LEAD	0.256	0.034	-0.016	0.807	-0.040	-0.108
EXPERIENCE-LEAD	0.326	0.100	-0.147	0.860	0.121	-0.085
INTENSITY-SYND	0.801	-0.113	-0.093	0.033	0.189	-0.094
DURATION-SYND	0.497	-0.093	-0.112	-0.140	0.282	-0.155
REPUTATION-SYND	0.763	-0.157	-0.125	0.304	0.080	0.008
MARKETSHARE-SYND	0.893	0.059	-0.019	0.128	-0.010	-0.059
IMPORTANCE-SYND	0.813	-0.024	0.072	0.222	-0.083	-0.024
EXPERIENCE-SYND	0.888	-0.023	-0.086	0.232	0.135	0.004
ASYMMETRY-INTENSITY	0.551	0.589	-0.035	0.199	0.215	0.078
ASYMMETRY-DURATION	0.235	0.734	-0.003	0.060	0.170	0.075
ASYMMETRY-REPUTATION	0.604	0.366	-0.198	0.371	0.181	0.044
ASYMMETRY-MARKETSHARE	0.614	0.553	0.046	0.293	0.042	0.078
ASYMMETRY-IMPORTANCE	0.601	0.465	0.116	0.238	-0.004	0.044
ASYMMETRY-EXPERIENCE	0.590	0.457	-0.029	0.378	0.181	0.123
LEAD-US	0.271	0.069	-0.778	0.110	0.044	0.191
LEAD-JAPAN	-0.166	-0.089	0.199	0.128	0.093	0.013
LEAD-UK	0.073	0.086	0.422	-0.021	-0.130	-0.192
SYND-US-CA	0.316	0.048	-0.827	0.088	0.098	0.012
SYND-LATAMERICA	0.005	-0.001	0.042	0.019	-0.060	-0.056
SYND-WESTEUROPE	0.162	0.166	0.411	-0.079	-0.300	-0.050
SYND-AFRICA-MIDDLE	0.042	0.035	0.164	-0.028	-0.022	-0.032
SYND-ASIA	-0.460	-0.173	0.578	-0.044	0.111	0.031

Table 4. Descriptive statistics for structure components, borrower-specific and loan-specific variables.

This table summarizes the summary statistics for the structure component scores and factor-based scores, borrower-specific and loan-specific variables used in the analyses throughout the paper. Component scores and weighted factor-based scores are defined in section 3 of the paper. The remaining variables are defined in Appendix B. N is the number of observations. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	All borrowers			US Borrowers			Non-US borrowers		
	N	Mean	Std.Dev.	N	Mean	Std.Dev.	N	Mean	Std.Dev.
Factor scores									
QUALITY	15906	0.007	0.99	10781	0.120	0.93	5125	-0.232	1.05
HETEROGENEITY	15906	-0.022	0.99	10781	0.042	0.94	5125	-0.157	1.06
LEAD	15906	-0.014	1.00	10781	0.050	1.08	5125	-0.147	0.79
GEOGRAPHY	15906	0.047	0.98	10781	0.622	0.41	5125	-1.164	0.68
RELATIONS	15906	-0.046	0.95	10781	0.029	0.90	5125	-0.204	1.02
INDUSTRY	15906	0.001	1.01	10781	0.024	1.02	5125	-0.049	0.98
Weighted factor-based scores									
QUALITY	15906	398.351	274.42	10781	442.888	282.64	5125	304.661	229.63
HETEROGENEITY	15906	583.832	431.28	10781	623.871	446.02	5125	499.605	385.19
LEAD	15906	392.081	385.35	10781	456.867	413.06	5125	255.797	273.10
GEOGRAPHY	15906	1.883	2.00	10781	0.891	0.58	5125	3.970	2.28
RELATIONS	15906	29.237	33.57	10781	34.028	35.70	5125	19.160	25.82
INDUSTRY	15906	1.545	0.40	10781	1.535	0.42	5125	1.566	0.37
Weighted factor-based scores with concentration variables:									
QUALITY	5902	338.240	237.94	3774	396.521	244.35	2128	234.880	185.59
CONCENTRATION	5902	614.144	428.74	3774	666.263	450.61	2128	521.712	369.37
GEOGRAPHY	5902	2.196	2.39	3774	0.966	0.61	2128	4.378	2.78
LEAD	5902	325.940	353.10	3774	397.425	382.05	2128	199.161	248.69
RELATIONS	5902	29.306	33.46	3774	35.077	35.84	2128	19.070	25.77
INDUSTRY	5902	0.753	0.20	3774	0.757	0.20	2128	0.746	0.22
Borrower and loan variables									
SIZE	15906	6.932	1.63	10781	6.847	1.55	5125	7.112	1.78
RELAMT	15906	0.434	1.56	10781	0.451	1.67	5125	0.398	1.29
LEVERAGE	15906	1.933	27.40	10781	1.716	32.57	5125	2.389	9.89
PROFIT	15906	36.987	117.08	10781	33.837	129.30	5125	43.612	85.51
DEBTA	15906	0.628	0.26	10781	0.631	0.28	5125	0.621	0.22
OPAQUE	15906	0.554	0.50	10781	0.397	0.49	5125	0.885	0.32
ECONDEV	15906	9.988	0.69	10781	10.242	0.06	5125	9.455	1.02
EMERGING	15906	0.068	0.25	10781	0.000	0.00	5125	0.212	0.41
LEGAL	15906	0.790	0.41	10781	1.000	0.00	5125	0.349	0.48
MTY	15906	3.719	0.70	10781	3.680	0.70	5125	3.802	0.70
AMT	15906	18.943	1.92	10781	19.305	1.22	5125	18.183	2.73
TRANCHES	15906	1.970	1.29	10781	1.830	1.05	5125	2.264	1.65
MULT-TRANCHES	15906	0.542	0.50	10781	0.518	0.50	5125	0.594	0.49
SECURED	15906	0.400	0.49	10781	0.482	0.50	5125	0.228	0.42
COVENANT	15906	0.485	0.50	10781	0.681	0.47	5125	0.073	0.26
SENIOR	15906	0.995	0.07	10781	0.999	0.04	5125	0.987	0.12
POOL-LENDERS	15906	24.748	30.92	10781	26.197	30.68	5125	21.700	31.21
POOL-LEADS	15906	3.951	6.23	10781	3.189	2.65	5125	5.554	10.10
FIRST-SYND	15906	0.193	0.39	10781	0.132	0.34	5125	0.319	0.47
FIRST-ALL	15906	0.158	0.37	10781	0.094	0.29	5125	0.294	0.46
INFO-SYND	15906	2.336	2.51	10781	2.459	2.03	5125	2.076	3.28
INFO-ALL	15906	2.685	2.85	10781	2.802	2.22	5125	2.439	3.84

Table 5. Multivariate regressions for the loan spread

This table summarizes the results for regression model (1) when the loan spread is regressed against the six structure components measured either with component scores or weighted factor-based scores, controlling for loan-specific and borrower-specific variables. The structure components are defined on the subset of 36 structure variables. Multivariate regressions are estimated using OLS and t-values are corrected for heteroskedasticity. "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations used in each model specification. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	Panel A - Component scores			Panel B - Weighted factor-based scores			Panel C - Weighted factor-based scores for US borrowers			Panel D - Weighted factor-based scores for non-US borrowers		
	Coeff.	t-value		Coeff.	t-value		Coeff.	t-value		Coeff.	t-value	
INTERCEPT	633.884	20.34	***	667.410	21.62	***	851.561	22.39	***	573.016	17.53	***
QUALITY	-16.262	-14.17	***	-0.023	-5.97	***	-0.029	-6.34	***	0.009	1.31	
HETEROGENEITY	-19.689	-16.61	***	-0.043	-16.26	***	-0.042	-12.94	***	-0.029	-6.20	***
LEAD	0.245	0.29		0.016	6.15	***	0.015	5.09	***	0.025	4.50	***
GEOGRAPHY	-3.176	-1.64		0.015	0.02		4.086	2.22	**	-1.743	-2.47	**
RELATIONS	-7.083	-6.49	***	-0.144	-5.12	***	-0.092	-2.84	***	-0.176	-3.14	***
INDUSTRY	16.567	19.46	***	-36.399	-17.16	***	-34.121	-13.14	***	-31.424	-8.93	***
SIZE	-12.514	-13.75	***	-12.337	-13.94	***	-8.251	-6.02	***	-13.014	-11.10	***
RELAMT	-0.867	0.55		-0.770	-0.54		0.360	0.63		-0.430	1.13	
LEVERAGE	-0.038	-1.30		-0.043	-1.45		-0.056	-1.82	*	0.334	2.59	***
PROFIT	-0.029	-4.15	***	-0.031	-4.51	***	-0.033	-4.25	***	-0.016	-1.08	
DEBTA	77.306	23.37	***	77.136	23.35	***	83.131	21.24	***	31.900	5.20	***
OPAQUE	-1.709	-0.82		-0.761	-0.36		-3.787	-1.55		1.048	0.23	
ECONDEV	-5.154	-2.19	**	-1.282	-0.55				***	-0.397	-0.18	
EMERGING	13.992	2.26	**	21.861	3.58	***			***	23.018	3.78	***
LEGAL	23.333	6.99	***	20.737	6.20	***			***	13.197	4.05	***
MTY	-18.702	-11.93	***	-18.326	-11.68	***	-23.359	-11.20	***	-0.430	-0.19	
AMT	-0.177	-0.19		-1.492	-1.61		-11.575	-7.02	***	2.290	2.22	**
TRANCHES	13.400	13.59	***	13.523	13.71	***	17.776	10.94	***	15.887	13.21	***
MULT-TRANCHES	3.256	1.40		2.787	1.19		5.169	1.63		-12.158	-3.47	***
SECURED	64.794	31.73	***	65.396	32.01	***	71.006	28.22	***	31.823	9.29	***
COVENANT	-17.708	-8.15	***	-15.864	-7.31	***	-17.367	-7.01	***	4.596	0.87	
SENIOR	-392.435	-34.15	***	-391.831	-34.07	***	-395.398	-14.12	***	-397.225	-35.21	***
Borrower country fixed effects	Yes			Yes			No			Yes		
Borrower industry fixed effects	Yes			Yes			Yes			Yes		
Loan type fixed effects	Yes			Yes			Yes			Yes		
Loan purpose fixed effects	Yes			Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes			Yes		
N	15906			15906			10781			5125		
Adj. R^2	0.4813			0.4802			0.5058			0.4659		
F-value	296.21***			294.91***			257.62***			90.38***		

Table 6. Multivariate regressions for the loan spread using concentration variables

This table summarizes the results for regression model (1) when the loan spread is regressed against the six structure components measured either with component scores or weighted factor-based scores, controlling for loan-specific and borrower-specific variables. The structure components are defined on the entire set of 40 structure variables, including concentration variables. Multivariate regressions are estimated using OLS and t-values are corrected for heteroskedasticity. "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations used in each model specification. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	Panel A - With component scores			Panel B - With weighted factor-based scores			Panel C - Weighted factor-based scores for US borrowers			Panel D - Weighted factor-based scores for non-US borrowers		
	Coeff.	t-value		Coeff.	t-value		Coeff.	t-value		Coeff.	t-value	
INTERCEPT	536.108	10.16	***	652.356	16.13	***	711.035	11.03	***	616.055	12.67	***
QUALITY	-12.409	-6.22	***	-0.026	-4.09	***	-0.029	-3.98	***	0.001	0.09	
CONCENTRATION	-13.541	-6.67	***	-0.030	-7.10	***	-0.021	-4.08	***	-0.024	-3.15	***
GEOGRAPHY	4.623	1.37		0.008	0.01		2.641	1.10		-0.854	-1.09	
LEAD	2.510	1.67	*	0.012	2.99	***	0.012	2.66	***	0.008	0.91	
RELATIONS	-8.333	-4.38	***	-0.103	-2.71	***	-0.037	-0.87		-0.166	-2.13	**
INDUSTRY	10.087	6.43	***	-56.741	-9.92	***	-69.267	-9.41	***	-25.401	-2.89	***
SIZE	-9.728	-6.01	***	-12.571	-10.32	***	-9.758	-4.27	***	-11.066	-6.83	***
RELAMT	0.000	-0.48		-0.363	-0.32		2.202	0.72		-0.449	-0.38	
LEVERAGE	0.056	0.55		0.000	-0.01		-0.014	-0.25		0.112	0.81	
PROFIT	-0.168	-2.36	**	-0.030	-3.80	***	-0.025	-3.24	***	-0.178	-2.33	**
DEBTA	85.433	11.94	***	75.068	14.48	***	77.045	13.16	***	25.505	2.32	**
OPAQUE	2.295	0.59		3.719	1.24		-0.191	-0.06		-0.326	-0.04	
ECONDEV	-8.112	-2.37	**	-7.890	-3.10	***				-9.385	-3.34	***
EMERGING	13.428	1.46		18.380	2.68	***				15.216	1.96	*
LEGAL	16.012	2.77	***	10.870	2.36	**				2.558	0.53	
MTY	-7.561	-2.65	***	-15.246	-7.26	***	-20.266	-6.90	***	0.210	0.07	
AMT	-0.216	-0.13		-0.105	-0.09		-8.279	-3.06	***	3.121	2.24	**
TRANCHES	12.708	5.55	***	14.654	7.58	***	14.944	5.19	***	13.978	5.38	***
MULT-TRANCHES	-5.195	-1.12		-9.255	-2.54	**	-4.162	-0.87		-19.457	-3.47	***
SECURED	57.534	16.19	***	58.954	21.75	***	68.199	20.23	***	20.059	4.30	***
COVENANT	-12.517	-2.72	***	-1.560	-0.47		-3.811	-1.00		18.053	2.50	**
SENIOR	-337.772	-14.09	***	-355.816	-17.51	***	-340.171	-6.93	***	-373.480	-17.33	***
Borrower country fixed effects	Yes			Yes			No			Yes		
Borrower industry fixed effects	Yes			Yes			Yes			Yes		
Loan type fixed effects	Yes			Yes			Yes			Yes		
Loan purpose fixed effects	Yes			Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes			Yes		
N	3129			5902			3774			2128		
Adj. R^2	0.4763			0.4449			0.5259			0.2894		
F-value	57.89***			95.58***			100.65***			18.33***		

Table 7. Endogenous regressions for the loan spread and syndicate structure components

This table summarizes the results for the estimation of models (1), (2a), (2b) and (2c) allowing for the endogeneity of three structure components and controlling for loan-specific and borrower-specific variables. Multivariate regressions are estimated using 3-stage least squares and t-values are corrected for heteroskedasticity. "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations used in each model specification. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	SPREAD			*QUALITY*			*HETEROGENEITY*			*RELATIONS*		
	Coeff.	t-value		Coeff.	t-value		Coeff.	t-value		Coeff.	t-value	
INTERCEPT	649.312	8.65	***	20.859	0.41		-246.578	-3.05	***	43.538	6.44	***
SPREAD				-0.448	-15.57	***	-0.693	-15.26	***	-0.106	-28.83	***
QUALITY	-0.678	-16.07	***									
HETEROGENEITY	0.046	1.25										
LEAD	0.147	10.09	***	0.220	43.29	***						
GEOGRAPHY	-3.564	-3.69	***	-3.256	-2.29	**	28.084	12.51	***	-0.753	-4.01	***
RELATIONS	-0.604	-10.45	***	1.057	15.99	***	0.634	6.06	***			***
INDUSTRY	-32.326	-11.24	***	-9.565	-2.02	**	44.204	6.04	***	1.754	2.86	***
SIZE	-3.875	-2.06	**	18.283	10.74	***	75.458	27.86	***	-1.210	-5.36	***
RELAMT	-0.175	-0.36										
LEVERAGE	-0.089	-3.27	***									
PROFIT	-0.017	-2.61	***									
DEBTA	62.171	15.12	***	9.931	1.30		0.914	0.08		5.872	5.85	***
OPAQUE	-3.467	-1.40		-3.604	-0.81		-54.356	-7.78	***	-3.505	-5.99	***
ECONDEV	13.905	4.86	***	18.335	3.71	***	12.941	1.66	*	-0.639	-0.98	
EMERGING	25.139	3.07	***	19.324	1.53		-2.738	-0.14		-12.112	-7.27	***
LEGAL	41.414	8.74	***									
MTY	-17.047	-8.01	***									
AMT	-4.786	-1.48										
TRANCHES	10.191	10.38	***									
MULT-TRANCHES	-10.114	-3.73	***									
SECURED	36.952	8.98	***									
COVENANT	-42.905	-6.97	***									
SENIOR	-308.655	-28.33	***									
POOL-LENDERS				-0.802	-8.80	***	1.119	7.64	***	0.359	30.35	***
POOL-LEADS				0.933	2.19	**	-5.024	-6.87	***	-0.112	-1.88	*
FIRST-SYND				-2.850	-0.34		-18.623	-1.17				
FIRST-ALL				12.438	1.38		32.571	1.94	*			
INFO-SYND				3.282	1.60		8.032	2.20	**	1.901	6.59	***
INFO-ALL				-5.843	-3.18	***	-7.365	-2.22	**	0.440	1.68	*
Borrower country fixed effects	Yes			Yes			Yes			Yes		
Borrower industry fixed effects	Yes			No			No			No		
Loan type fixed effects	Yes			No			No			No		
Loan purpose fixed effects	Yes			No			No			No		
Year fixed effects	Yes			Yes			Yes			Yes		
N	15906											
System weighted R^2	0.453											

Table 8. Endogenous regressions for the loan spread and components using concentration variables

This table summarizes the results for the estimation of models (1), (2a), (2b) and (2c) allowing for the endogeneity of three structure components and controlling for loan-specific and borrower-specific variables. Multivariate regressions are estimated using 3-stage least squares and t-values are corrected for heteroskedasticity. "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations used in each model specification. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	SPREAD			*QUALITY*			*CONCENTRATION*			*RELATIONS*		
	Coeff.	t-value		Coeff.	t-value		Coeff.	t-value		Coeff.	t-value	
INTERCEPT	731.538	10.30	***	242.598	4.30	***	187.144	2.05	**	37.536	4.26	***
SPREAD				-0.611	-11.60	***	-0.849	-9.98	***	-0.099	-12.18	***
QUALITY	-0.430	-7.82	***									
CONCENTRATION	0.013	0.38										
GEOGRAPHY	0.273	0.32		-0.697	-0.45		25.227	10.16	***	-0.317	-1.32	
LEAD	0.098	4.85	***	0.241	31.45	***	0.316	25.54	***			
RELATIONS	-0.499	-7.84	***	0.737	8.21	***	-0.571	-3.92	***			
INDUSTRY	-39.765	-5.66	***	1.212	0.10		0.756	0.04		2.987	1.53	
SIZE	-6.989	-3.14	***	5.716	2.32	**	75.116	18.80	***	-0.524	-1.36	
RELAMT	-1.180	-1.19										
LEVERAGE	0.008	0.19										
PROFIT	-0.016	-2.25	**									
DEBTA	68.257	12.62	***	27.622	2.25	**	61.443	3.11	***	7.385	3.88	***
OPAQUE	4.800	1.40		6.041	0.94		-69.309	-6.71	***	-2.053	-2.06	**
ECONDEV	-4.021	-1.50		-0.356	-0.07		-22.488	-2.61	***	-0.549	-0.66	
EMERGING	28.023	3.13	***	25.593	1.81	*	-62.383	-2.72	***	-12.221	-5.53	***
LEGAL	19.999	4.68	***									
MTY	-16.611	-6.12	***									
AMT	-6.061	-1.91	*									
TRANCHES	10.087	6.07	***									
MULT-TRANCHES	-13.211	-4.03	***									
SECURED	39.225	6.94	***									
COVENANT	-2.707	-0.66										
SENIOR	-296.002	-16.25	***									
POOL-LENDERS				-0.974	-6.34	***	2.507	9.94	***	0.445	18.85	***
POOL-LEADS				3.022	5.37	***	-6.730	-7.10	***	-0.533	-5.84	***
FIRST-SYND				-8.206	-0.74		-56.929	-2.93	***			
FIRST-ALL				23.328	1.90	*	80.196	3.84	***			
INFO-SYND				1.936	0.79		9.789	2.31	**	1.281	3.18	***
INFO-ALL				-3.801	-1.72	*	-8.070	-2.11	**	0.774	2.12	**
Borrower country fixed effects	Yes			Yes			Yes			Yes		
Borrower industry fixed effects	Yes			No			No			No		
Loan type fixed effects	Yes			No			No			No		
Loan purpose fixed effects	Yes			No			No			No		
Year fixed effects	Yes			Yes			Yes			Yes		
N	5902											
System weighted R^2	0.486											

Table 9. Univariate comparison of syndicate structure components, loan-specific and borrower-specific variables conditional on the distribution method of the loan

This table summarizes the summary statistics for the structure component, measured with weighted factor-based scores, borrower-specific and loan-specific variables used in the analyses throughout the paper. Component scores and weighted factor-based scores are defined in section 3 of the paper. The remaining variables are defined in Appendix B. N is the number of observations. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	Traditional syndications			Privately placed deals			Equality of Means		Equality of Variances	
	N	Mean	Std.Dev	N	Mean	Std.Dev	t-value		F-value	
Weighted factor-based score										
QUALITY	19718	401.287	278.84	597	414.584	342.40	-0.94		1.51	***
HETEROGENEITY	19718	598.534	431.78	597	476.646	406.57	7.20	***	1.13	**
LEAD	19718	398.980	387.67	597	253.489	256.72	13.39	***	2.28	***
GEOGRAPHY	19718	1.839	1.90	597	5.339	3.20	-26.58	***	2.82	***
RELATIONS	19718	29.583	33.47	597	26.848	32.28	1.96	**	1.08	
INDUSTRY	19718	1.549	0.40	597	1.575	0.34	-1.84	*	1.35	***
Borrower and loan-specific variables										
SPREAD	19718	142.585	136.36	597	102.500	108.43	8.82	***	1.58	***
UPFRONT FEE	4058	45.392	60.68	68	46.620	41.68	-0.24		2.12	***
COMMITMENT FEE	8254	33.649	22.74	157	22.464	21.83	6.11	***	1.09	
ANNUAL FEE	4440	15.361	16.15	21	12.086	11.93	0.93		1.83	
CANCELLATION FEE	354	160.331	116.42	1	100.000	.	.		.	
SIZE	19718	7.194	1.76	597	7.835	1.89	-8.19	***	1.15	**
RELAMT	19718	0.411	1.68	597	0.168	0.29	14.48	***	34.08	***
LEVERAGE	19718	11.587	883.58	597	4.100	13.38	1.19		4357.98	***
PROFIT	15475	36.737	118.59	431	45.967	29.30	-5.42	***	16.36	***
DEBTA	19718	0.646	0.26	597	0.648	0.19	-0.31		1.77	***
OPAQUE	19718	0.531	0.50	597	0.874	0.33	-24.46	***	2.26	***
ECONDEV	19718	9.973	0.73	597	9.537	1.01	10.46	***	1.92	***
EMERGING	19718	0.079	0.27	597	0.283	0.45	-11.02	***	2.81	***
LEGAL	19718	0.809	0.39	597	0.479	0.50	16.01	***	1.62	***
MTY	19718	3.659	0.72	597	3.522	0.79	4.20	***	1.19	***
AMT	19718	18.999	1.88	597	18.439	2.40	5.65	***	1.63	***
TRANCHES	19718	1.910	1.26	597	1.581	0.90	8.69	***	1.97	***
MULT-TRANCHES	19718	0.517	0.50	597	0.395	0.49	5.88	***	1.04	
SECURED	19718	0.362	0.48	597	0.124	0.33	17.12	***	2.12	***
COVENANT	19718	0.462	0.50	597	0.069	0.25	35.88	***	3.88	***
SENIOR	19718	0.996	0.06	597	0.990	0.10	1.47		2.50	***
BORROWER-NORTHAMERICA	19718	0.703	0.45	597	0.101	0.30	47.28	***	2.31	***
BORROWER-EUROPE	19718	0.114	0.32	597	0.342	0.47	-11.66	***	2.24	***
BORROWER-ASIA	19718	0.157	0.36	597	0.471	0.50	-15.22	***	1.88	***
POOL-LENDERS	19718	26.251	33.27	597	34.883	53.09	-3.96	***	2.55	***
POOL-LEADS	19718	4.237	6.84	597	11.114	18.47	-9.08	***	7.30	***
FIRST-SYND	19718	0.189	0.39	597	0.263	0.44	-4.04	***	1.27	***
FIRST-ALL	19718	0.155	0.36	597	0.248	0.43	-5.17	***	1.42	***
INFO-SYND	19718	2.490	2.61	597	2.618	3.25	-0.97	***	1.55	***
INFO-ALL	19718	2.987	3.86	597	3.776	5.90	-3.26	***	2.33	***

Table 10. Multivariate regressions for the loan spread conditional on the distribution method

This table summarizes the results for regression model (3) when the loan spread is regressed against an indicator variable for the distribution method (*CLUB*), controlling for loan-specific and borrower-specific variables. Multivariate regressions are estimated using OLS and t-values are corrected for heteroskedasticity."*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations used in each model specification. Borrower industry, loan purpose, loan type, and year dummy variables are not reported to save valuable journal space.

	Panel A - Without structure components			Panel B - With weighted factor-based scores			Panel C - Conditional effects and weighted factor-based scores		
	Coeff.	t-value		Coeff.	t-value		Coeff.	t-value	
INTERCEPT	690.282	22.26	***	691.790	22.26	***	710.217	22.70	***
CLUB	-16.293	-3.08	***	-20.917	-3.99	***	-14.452	-1.24	
QUALITY				-0.022	-5.77	***	-0.022	-5.58	***
HETEROGENEITY				-0.044	-16.53	***	-0.044	-16.62	***
LEAD				0.016	6.10	***	0.016	5.95	***
GEOGRAPHY				0.417	0.54		0.562	0.79	
RELATIONS				-0.143	-5.10	***	-0.149	-5.25	***
INDUSTRY				-36.338	-17.14	***	-35.969	-16.85	***
CLUB x QUALITY							-0.017	-0.93	
CLUB x HETEROGENEITY							0.030	1.65	*
CLUB x LEAD							0.040	1.70	*
CLUB x GEOGRAPHY							-5.131	-2.33	**
CLUB x RELATIONS							0.331	2.09	**
CLUB x INDUSTRY							-22.954	-1.45	
SIZE	-16.271	-18.54	***	-12.331	-13.94	***	-12.226	-13.81	***
RELAMT	-1.001	-1.78	*	0.000	-1.44		-0.802	-1.46	
LEVERAGE	-0.047	-1.55		-0.042	-1.42		-0.042	-1.41	
PROFIT	-0.029	-4.04	***	-0.031	-4.51	***	-0.031	-4.54	***
DEBTA	82.128	24.38	***	77.173	23.37	***	77.246	23.45	***
OPAQUE	0.370	0.17		-0.694	-0.33		-0.638	-0.31	
ECONDEV	-0.626	-0.26		-0.705	-0.30		-0.415	-0.18	
EMERGING	30.931	4.96	***	23.286	3.81	***	24.139	3.93	***
LEGAL	23.757	7.02	***	21.084	6.30	***	20.075	5.99	***
MTY	-20.403	-12.75	***	-18.547	-11.82	***	-19.109	-12.01	***
AMT	-4.386	-4.85	***	-1.451	-1.57		-1.266	-1.36	
TRANCHES	14.181	14.04	***	13.268	13.43	***	12.916	13.08	***
MULT-TRANCHES	3.222	1.35		2.905	1.24		3.489	1.49	
SECURED	73.626	35.71	***	65.217	31.93	***	65.875	32.06	***
COVENANT	-19.368	-8.94	***	-15.793	-7.28	***	-15.339	-7.04	***
SENIOR	-388.441	-33.03	***	-392.030	-34.10	***	-416.237	-34.96	***
CLUB x RELAMT							21.429	1.28	
CLUB x MTY							15.572	2.23	**
CLUB x AMT							-4.908	-1.76	*
CLUB x SECURED							-52.132	-3.54	***
CLUB x COVENANT							-43.937	-2.39	**
CLUB x SENIOR							339.326	7.63	***
Borrower country fixed effects	Yes			Yes			Yes		
Borrower industry fixed effects	Yes			Yes			Yes		
Loan type fixed effects	Yes			Yes			Yes		
Loan purpose fixed effects	Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes		
N	15906			15906			15906		
Adj. R^2	0.4558			0.4807			0.4834		
F-value	297.06***			289.72***			237.20***		

Table 11. Logistic model to estimate propensity scores for the treated and control observations

This table summarizes the results for logistic model (10) where the dependent variable, the distribution method *CLUB*, is regressed against a number of structure components, loan-specific and borrower-specific covariates. The regression is estimated using maximum likelihood and t-values are corrected for heteroskedasticity. "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively. N is the number of observations. N is the number of observations.

	Coeff	**Odds ratio**	**Std.Err.**	
INTERCEPT	-4.5132		0.984	***
LEAD	-0.0005	0.999	0.000	***
GEOGRAPHY	0.2729	1.314	0.020	***
INDUSTRY	0.1263	1.135	0.144	
SIZE	0.0700	1.072	0.033	**
LEVERAGE	-0.0018	0.998	0.002	
OPAQUE	0.4677	1.596	0.153	***
ECONDEV	0.3410	1.406	0.075	***
EMERGING	1.1424	3.134	0.191	***
MTY	-0.4751	0.622	0.062	***
AMT	-0.1652	0.848	0.029	***
POOL-LENDERS	-0.0035	0.997	0.003	
POOL-LEADS	0.0116	1.012	0.010	
FIRST-SYND	-0.5955	0.551	0.347	*
FIRST-ALL	0.7105	2.035	0.348	**
INFO-SYND	-0.1079	0.898	0.031	***
INFO-ALL	-0.0293	0.971	0.015	*
INFO-CLUB	0.6849	1.984	0.071	***
REL-LENDERS	1.2511	3.494	0.159	***
REL-LEADS	-0.9635	0.382	0.148	***
BORROWER-ASIA	0.8602	2.364	0.184	***
BORROWER-EUROPE	1.4055	4.077	0.156	***
N	20315			
Pseudo R^2	0.2706			
Log pseudolikelihood	-1965			
Wald chi^2	1116.41***			

Table 12. Outcome variables using matching techniques

This table summarizes the average values of different outcome variables (*SPREAD*, *QUALITY*, *HETEROGENEITY* and *RELATIONS*) for the treated and the control data set. For each outcome variable, the average for the unmatched sample and the average treatment effect on the treated (ATT) are estimated. S.E. is the standard error of the difference between the averages of the two subsamples. Panel A presents the results for the kernel matching method using the Epanechnikov kernel, Panel B presents results for the LLR matching method using the tricube kernel, Panel C presents the results for the 1:2 neighbour-matching method without replacement and Panel D presents the results for the 1:3 matching method without replacement. Matching is done with common support. Standard error for ATT does not take into account that the propensity score is estimated. For LLR matching, standard errors are obtained with bootstrapping. Default bandwidth is 0.8 for LLR matching and 0.06 for kernel matching. . "*", "**" and "***" indicate significance at the 10%, 5% and 1% levels, respectively.

		Panel A - Kernel matching					**Panel B - LLR matching**				
Outcome variable	**Sample**	**Treated: Club deals**	**Control: Syndications**	**Diff.**	**S.E.**	**t-stat**	**Treated: Club deals**	**Control: Syndications**	**Diff.**	**S.E.**	**t-stat**
SPREAD	Unmatched	102.500	142.585	-40.085	5.63	-7.12 ***	102.500	142.585	-40.085	5.63	-7.12 ***
	ATT	102.815	108.928	-6.113	5.18	-1.18	102.815	104.824	-2.009	6.17	-0.33
QUALITY	Unmatched	414.584	401.287	13.297	11.67	1.14 ***	414.584	401.287	13.297	11.67	1.14
	ATT	414.327	331.496	82.831	15.11	5.48 ***	414.327	312.795	101.532	16.36	6.21 ***
HETEROGENEITY	Unmatched	476.656	598.534	-121.878	17.91	-6.81 ***	476.656	598.534	-121.878	17.91	-6.81 ***
	ATT	472.162	604.523	-132.361	18.58	-7.12 ***	472.162	578.443	-106.281	24.28	-4.38 ***
RELATIONS	Unmatched	26.848	29.583	-2.735	1.39	-1.97 ***	26.848	29.583	-2.735	1.39	-1.97 **
	ATT	26.416	23.262	3.154	1.47	2.15 ***	26.416	20.719	5.697	1.73	3.29 ***
Sensitivity analyses for SPREAD:											
Changing Bandwidth:											
Small bandwidth = 0.01	ATT	103.167	102.828	0.339	5.51	0.06	102.815	103.614	-0.799	11.06	-0.07
Small bandwidth = 0.05	ATT	102.815	107.417	-4.602	5.22	-0.88	102.815	104.751	-1.936	9.68	-0.20
Large bandwidth = 0.8	ATT	102.815	141.757	-38.942	4.57	-8.52 ***	102.815	107.255	-4.441	10.59	-0.42
Trimming:											
2% (11 cases excluded)	ATT	103.693	111.020	-7.326	5.13	-1.43 *	103.693	106.787	-3.094	8.21	-0.38
5% (22 cases excluded)	ATT	103.693	111.020	-7.326	5.13	-1.43 *	103.693	106.787	-3.094	9.06	-0.34
10% (44 cases excluded)	ATT	105.945	113.367	-7.422	5.21	-1.42 *	105.945	109.142	-3.197	9.00	-0.36
Kernel											
Uniform kernel	ATT	102.815	111.174	-8.359	5.13	-1.63 *	102.815	105.043	-2.228	5.29	-0.42
Tricube kernel	ATT	102.815	107.584	-4.769	5.22	-0.91					
Normal kernel	ATT	102.815	120.937	-18.122	4.96	-3.65 ***	102.815	104.565	-1.750	5.24	-0.33
Epanechnikov kernel	ATT						102.815	104.426	-1.611	5.30	-0.30
		Panel C - 1:2 matching					**Panel D - 1:3 matching**				
Outcome variable	**Sample**	**Treated: Club deals**	**Control: Syndications**	**Diff.**	**S.E.**	**t-stat**	**Treated: Club deals**	**Control: Syndications**	**Diff.**	**S.E.**	**t-stat**
SPREAD	Unmatched	102.500	142.585	-40.085	5.63	-7.12 ***	102.500	142.585	-40.085	5.63	-7.12 ***
	ATT	102.815	97.019	5.796	6.00	0.97	102.815	96.777	6.038	5.87	1.03
QUALITY	Unmatched	414.584	401.287	13.297	11.67	1.14	414.584	401.287	13.297	11.67	1.14 ***
	ATT	414.327	321.561	92.767	17.03	5.45 ***	414.327	322.214	92.113	16.36	5.63 ***
HETEROGENEITY	Unmatched	476.656	598.534	-121.878	17.91	-6.81 ***	476.656	598.534	-121.878	17.91	-6.81 ***
	ATT	472.162	593.455	-121.293	23.42	-5.18 ***	472.162	597.619	-125.457	21.77	-5.76 ***
RELATIONS	Unmatched	26.848	29.583	-2.735	1.39	-1.97 **	26.848	29.583	-2.735	1.39	-1.97 ***
	ATT	26.416	22.452	3.964	1.68	2.35 ***	26.416	22.036	4.380	1.59	2.75 ***
Sensitivity analyses for SPREAD:											
Trimming:											
2% (11 cases excluded)	ATT	103.693	99.019	4.674	6.03	0.78	103.693	98.631	5.062	5.90	0.86
5% (22 cases excluded)	ATT	103.693	99.019	4.674	6.03	0.78	103.693	98.631	5.062	5.90	0.86
10% (44 cases excluded)	ATT	105.945	101.611	4.334	6.22	0.70	105.945	100.854	5.091	6.08	0.84