BANK REPUTATION IN THE PRIVATE DEBT MARKET *

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Abstract:

We examine the impact of lead arrangers' reputation on the design of loan contracts such as spread and fees charged. Controlling for the non-randomness of the lender-borrower match (self-selection bias), we find that the reputation of top tier arrangers leads to higher spreads, and that top tier arrangers retain larger fractions of their loans in their syndicates. These larger spreads are especially pronounced for borrowers without credit rating that have the most to gain from the certification assumed by virtue of a loan contract with a top tier arranger. This certification channel differs from the one found in public markets, where certification leads to a reduced spread offered to the best clients. These differences between public and private markets can be explained by differences in the way they operate and are structured. Interestingly, the effect is strongest for transactions done after the changes in the banking regulations (including the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994) that led to significant consolidations in the banking industry, including among the largest commercial banks.

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Loan syndication is a major segment of the wholesale business of commercial banks in the United States (US).[1] With more than two trillion dollars in commitment volume outstanding, the syndicated loan market is an increasingly important source of financing for corporations. Typically, a loan syndicate is formed by a mandated arranger, who is appointed by the borrower to bring together a group of institutional investors and banks that are prepared to lend money on specific terms to the borrower.

The reputation of the lead bank can be seen as a certification of the quality of the loan being syndicated.[2] The role of underwriter reputation is known to have large price consequences for bond issuers, especially for those underwriting below-investment grade bonds (see, for example, Fang, 2005).[3] Top tier underwriters offer better terms to their best clients in order to certify to the market a quality assurance on the issues they underwrite (Cook et al., 2003). Most recently, An and Chan (2008) show that underwriter reputation affects IPO underpricing and price revisions. Underwriters seeking to avoid a loss of reputation will attempt to gain commercially sensitive information about their clients to help them identify and market high quality issues. In this way, investors can infer the quality of an issue when specific underwriters put their reputation at stake. Less experienced underwriters, on the other hand, avoid this signalling strategy if they are less capable or find it too costly to obtain information about the true quality of their borrowers.

However, it is unclear whether the above phenomenon is also at play in the private debt market, and whether it is done through the same channel as in the public market. There are several reasons why the reputation of an underwriter may have a different effect on bank loan structure than on public bonds. While bond underwriters only act as intermediaries, loan arrangers typically retain a substantial fraction of the loan being issued. This strongly affects the potential costs associated with certification of borrowers. Moreover, the bank industry has undergone significant restructuring and consolidation (Brook et al., 2000) that most likely have impacted outcomes.

A further important feature is that the most reputable loan arrangers may have the capability to sherry-pick the best borrowers, notably because their certification effect may provide

[1] A recent survey is provided in Drucker and Puri (2006).
[2] This approach is consistent with papers on underwriter reputation associated with less severe under-pricing in initial public offerings (Carter and Manaster, 1990; Megginson and Weiss, 1991; Gomes, 2000).

benefits to these selected borrowers even beyond the loan market (Cook et al., 2003). This selection effect has been evidenced in other financial markets, such as the bond underwriter market (Puri, 1996; Fang, 2005) and the IPO market (An and Chan, 2008). More broadly speaking, dealing with endogeneity in corporate finance issues remains important, as evidenced by the recent contribution of Wintoki et al. (2010) on controlling for the dynamic nature of corporate finance relationships.

In this paper, we investigate how investment bank reputation influences the structure of bank loan contracts and thereby the terms at which corporations are able to access debt finance. Do reputable commercial banks that have better access to good borrowers signal quality through the same channel as bond underwriters? If yes, how does this affect the spread and fees charged? Does reputation affect deal characteristics of private debt through other channels than simply pricing? Further, how does reputation influence the structure and composition of loan syndicates?

An important departure in this paper is the development of a unified model of bank reputation that takes into account both the lending and syndicate markets. This is important because it provides the reader with a more complete understanding of the costs and benefits of bank reputation. To understand this point, consider the consequences of arrangers choosing not to resell any of their loans. It would be clear that there would be no need to certify to others the quality of the loans and thus we would witness few differences in loan structure between top tier arrangers and other banks with respect to certification, everything else being equal. However, arrangers that sell entire issues would very well benefit from certifying the quality of the borrowers if they could. Papers on bond markets have not taken this approach. With the bond market, it is reasonable to focus simply on a single market, the underwriting market, as here it is only intermediaries that resell most of the issued securities. In contrast, lead arrangers in the private debt market continue to hold a significant proportion of loans well after the issuers' offering.[4] Consequently, this provides commercial banks with an alternative tool to signal quality by retaining large fractions of the deal. Finally, offering better terms to the best borrowers would be at some cost to lenders if lenders retain higher fractions of their

[3] Gatti et al. (2007) provide evidence of similar effects in project finance.

[4] In recent years, lenders have sold some of these participations through securitization of loans. This however does not mean they do not bear the risk anymore, since (besides retaining some of the loan) they typically attach credit enhancement guarantees or put options to the securitized loans. Moreover, the fact that these loans cannot

deals. This cost is not incurred by bond underwriters as they only play the role of intermediary. This analysis provides a novel perspective on existing empirical findings on the extent to which bank reputation matters in private debt markets. The syndicated loan market offers a good setting for testing this.

The analysis in this paper provides a number of key empirical results. It shows, consistent with the differences between the bond and commercial loan markets, that while reputation significantly affects the design of loan contracts, the channel is different from what has been observed in bond markets. While most reputable lenders do indeed offer better terms, this is consistent with the idea that they also arrange loans for the best borrowers. Moreover, it strongly supports the notion that the top tier loan arrangers are able to select the best deals. This suggests that reputable arrangers self-select their borrowers, which may affect the analysis on pricing due to self-selection bias. However, when controlling for the non-randomness of borrower-lender match, we find that reputable arrangers charge *higher* spreads compared to a situation where reputation does not matter. The effect is strongest for borrowers without any investment grade or credit rating, who most likely suffer from information asymmetry. This is consistent with the view that top tier banks exploit the informational advantage that gives them more market power to charge higher spreads, compared to what borrowers would get in the absence of arranger reputation. The premium charged is highest for those who gain most from certification by a top tier lead arranger. Interestingly, the effect is strongest for transactions done after the 1994 banking deregulation that led to significant consolidations in the banking industry (the Riegle-Neal Interstate Banking and Branching Efficiency Act),[5] including among the largest commercial banks. This suggests that the resulting mergers have increased the market power of the top tier arrangers, who may have charged higher spreads subsequent to market consolidation. While reputation significantly affects spreads, we find, however, no evidence that it affects the inclusion of restrictive covenants in loan agreements. The latter is best explained by publicly available credit rating, such as Standard & Poor's (S&P), of the borrower, with no evidence of trading of price or protective covenants. These results are robust for a number of alternative specifications. While Fang (2005) obtained different results for the bond market,

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be sold that quickly means that lenders bear substantial risk between the time of loan issuance and resale of the loan.

[5] See, for example, Kroszner and Strahan (1999), Brook et al. (2000), Levine (2004), and Huang (2008), for related discussion on the deregulation of the US banking industry.

both sets of results are consistent with important differences observed between the two markets, in particular with respect to market concentration at the top.

This raises the question of whether top tier banks ask for lower arranger fees, given their spread structure. We find weak evidence that top tier arrangers indeed charge lower arranger fees, even when controlling for the self-selection of borrowers. However, they do so only for borrowers with credit rating. In line with our results on loan design, this again suggests that borrowers that benefit most from certification by the top tier banks (namely, those without a rating) are willing to pay more, not only in terms of spread but also fees to the arranger.

Given the role of lead arrangers, we also examine a second channel through which they can certify borrower quality: through greater participation in the loan syndicate. In this paper we provide evidence that more reputable arrangers indeed hold a larger fraction of the loans in a syndicate, though only when controlling for self-selection bias. Combining these findings with the results on spreads, we conclude that in the private syndicated loan market, direct certification of the loan is more likely through the higher retention of loan amount by the lead arranger, not through pricing (spread). Interestingly, this result only holds for borrowers without credit rating. We find no evidence of certification for rated borrowers. These contrary findings on the choice of certification channel between public and private markets can be explained by differences in the way they operate and are structured.

Our results have important implications for corporate finance, namely for corporations that rely on debt to finance their investments. They indicate how reputation of banks impact corporate access to debt finance (extending Nash et al., 2003), how the private debt market differs from the public (bond) market (our results are different from Fang, 2005), and which companies are more likely to attract reputable arrangers for their loan. Related studies have shown that this may further affect how corporations can raise capital in the equity market (e.g., Cook et al., 2003, and An and Chan, 2008). Finally, our result can be related to Brook et al. (2000) who deals with consolidations in the banking industry, a topic we also refer to in our study.

The rest of the paper is arranged as follows. Section 1 reviews the related literature. Section 2 offers empirical predictions from the certification hypothesis in the context of the syndicated loan market. Section 3 describes the data and variables. Section 4 provides details on how the

loan syndicate market operates and differs from other debt markets. Section 5 presents the empirical findings. Section 6 concludes.

1. RELATED LITERATURE

A significant quantity of research has been dedicated to understanding lead arrangers' activities in the private debt market. Many theories have emerged, for example, the monitoring hypothesis, that posits a negative relationship between the borrower's creditworthiness and delegation to the lead bank for monitoring. An increased need for monitoring would lead to smaller lender syndicates (Sufi, 2007). Early work by Smith and Warner (1979) discusses the agency cost of debt in terms of claim dilution, underinvestment, asset withdrawal and asset substitution. In response to agency problems, debt covenants may serve as an ex post monitoring device to protect the lenders' renegotiation position. In general, researchers consider covenants and co-agents as substitutes from the perspective of mitigating asymmetries within loan syndicates (Goyal, 2005). Another strand of the literature analyses the costs and benefits of lending relationship (Boot, 2000; Boot and Thakor, 2000).

Other relevant papers are those dealing with the use of covenants to reduce agency costs in the bank loan or public debt markets. For example, Bradley and Roberts (2004) discuss the role of restrictive covenants in US bank loans, showing that a substantial number of loans include protective provisions. A few other papers deal with the monitoring role of covenants in the public debt market, showing that compared to the loan market bond issuers face fewer restrictions (Gilson and Warner, 1998). Moreover, Nash et al. (2003) find evidence that high growth firms include fewer dividend covenants in their debt contracts, reflecting a preference for flexibility in financing rather than contracting practice. Chava et al. (2009) show some variation in spread and covenants, finding no significant movement in the direction of bondholder protection, but in the cases of merger protection and poison puts.

There is surprisingly little empirical evidence on the relationship between reputation and security pricing in the private loan market. Empirical evidence on the impact of the lead arranger's reputation has been examined for the syndicated market only sparsely, where evidence indicates that more reputable arrangers are able to attract larger syndicates and hold

smaller fractions of loans (Lee and Mullineaux, 2001).[6] Sufi (2007) studied the impact of asymmetric information between borrower and lead bank on the structure of the syndicate. His results are in line with the monitoring hypothesis that states that the lender's syndicate is more concentrated when asymmetric information is stronger, resulting in better monitoring incentives of syndicate members. Other papers deal with public debt markets. Fang (2005) evaluated empirically the role of certification hypothesis in the public bond market. She demonstrates that a reputable bank tends to be more selective in its underwriting decisions which are positively related to price improvements for the issuer, providing empirical support for a certification role of the underwriter. Her result holds even when controlling for self-selection bias. This contrasts with our finding for the private debt market, which is roughly the same size. Possible reasons for this difference are discussed later.

Other important contributions to this literature are from Puri (1996), Gande et al. (1997), Gande et al. (1999), Cremers et al. (2004), Esty and Megginson (2003), Gatti et al. (2007), and Narayanan et al. (2007). These papers focus, however, on the public bond market or project finance. For instance, Puri (1996) assess the impact of information on underwriter terms during the pre-Glass-Steagal Act period (1927-1929), when commercial banks could underwrite bonds just as investment banks. Cremers et al. (2004) show that the inclusion of specific covenants in bond contracts depends on the severity of potential shareholder-bondholder conflicts. Gatti et al. (2007) find that reputable banks provide overall lower spreads for project finance, generating a positive impact on lenders. Narayanan et al. (2007) examined whether commercial banks can use their reputation in private markets for their bond-underwriting activities.

Our study is also related to the literature strand on syndication. The early work by Wilson (1968) and others (e.g., Chowdry and Nanda, 1996) considers the rationale for syndication, showing that the risk-sharing effect of syndication drives the market. More recently, Pichler and Wilhelm (2001) explored the effect of members of a syndicate group delegating some of the monitoring responsibilities to the lead bank. They emphasized that a lead bank's ability to control the composition of the syndicate appears to play a large role in eliminating conflicts of interest between lead banks and syndicate members. Panyagometh and Roberts (2003)

[6] However, this study did not account for the self-selection bias that arises from the non-randomness of the arranger-borrower match. In this paper, we evidence that this is critical and in fact provides opposite conclusions. The same holds for Sufi (2007), who also does not control for self-selection.

show how syndicate members learn about the reputation effects of lead banks. This result documents lead banks by reputation based on average yearly amount of loans syndicated, but does not document which loans these banks arrange when evaluating lead arranger reputation. Finally, other literature focuses on the effects of capital constraints or informational deficits on the size and distribution of syndicate shares (Jones et al., 2005).

2. THEORY OF CERTIFICATION

In this section, we review the impact of bank reputation on certification of borrowers and extend it to the private syndicate loan market to derive hypotheses for our particular setting. We focus our discussion on empirical predictions that specifically relate to the two certification channels examined, namely, loan spread and syndicate structure.

2.1 Certification through Contracting (Reduced Spread)

The certification hypothesis relies on the implicit assumption that more established arrangers possess better information on borrowers. It builds on theoretical work of, among others, Shapiro (1983), Booth and Smith (1986) and Cook et al. (2003), who develop the more general signaling hypothesis around closely related to financial markets. The syndicated loan market is one in which lead arrangers intermediate between corporate borrowers and syndicate partners. Lead arrangers typically pass on part of the deal to other lenders by seeking syndicate partners after the deal is signed. Therefore, the certification hypothesis postulates that reputable lead arrangers may be able to offer better terms (a lower spread) to their best clients, which in turn signals the quality of a deal. This enables them to attract the best borrowers. Given that such a signal can only be credible from an established player that has better information on borrowers, deals with better terms for borrowers are more likely to be observed by top tier lead arrangers. Lenders not capable to access privileged information may engage in too risky loans when offering similar terms than well informed lenders. Thus, the top tier lead arrangers willing to certify their deals put their own reputation at stake. If they were not interested in signaling the quality of loans to facilitate sales within the syndicate, there would be no reason—for the purpose of certification—why arrangers would want to accept worse terms.

This argument supposes that top tier arrangers are better at identifying the true quality of borrowers such that at the time deals are negotiated they have useful private information that less reputable banks do not have. The arranger may possess private information that leads to the conclusion that the borrower has lower risk than is assumed by non-informed actors. Such a signal would be costlier to other arrangers if they were to accept similar deals, since a lower spread would translate into an expected return that does not compensate fully for the implied risk of the borrower. Thus, under the certification hypothesis we should expect more reputable arrangers to charge lower spreads.

In practice, this informational advantage for more established arrangers may stem from the increased information already collected from past deals (i.e., from a previous relationship established when lending to the same borrowers, consistent with the findings of Boot and Thakor, 2000) or from better access to shared information between syndicate partners. In both cases, top tier banks would have better capabilities for screening borrowers.

For the syndicate structure, signaling quality by means of contract design (i.e., lower spread) allows the lead arranger to sell a larger fraction of the loan to syndicate partners, and also possibly to attract larger syndicates. Therefore, under this certification channel, we expect reputable arrangers to retain a smaller fraction of deals in the syndicate. This in turn provides arrangers with greater diversification as more loan participation can be secured from other banks. In this way, the lead arrangers can benefit from their signals.

2.2 Certification through Higher Loan Retention (Syndicate Structure)

These last predictions on the structure of syndicates, however, only hold if the arrangers do not use the syndicate structure itself as a way to signal the quality of borrowers. Indeed, an alternative signaling method would be where arrangers retain a larger fraction of the loan within the syndicate, as in the spirit of Leland and Pyle (1977)**,** who take a more general view of signaling. This thus conveys the information that the lead arrangers are willing to take on greater risk, which could be costly for them in the case of bad loans. Therefore, we would expect top tier arrangers with better information about the borrower to retain larger stakes if they know the borrower is without risk.

Note that signaling through contract design (spread) alleviates the need for this second mechanism of signaling. In the empirical section, we investigate both channels of certification.[7]

2.3 Econometric Testing under Self-Selection Bias

From an econometrical perspective, standard estimation methods cannot be used, since we deal with private information that established arrangers possess. Since this information is not observable, it is likely that the borrower-lender match is not random. In other words, simply including a dummy variable in the regression specification that accounts for whether or not the given arranger is reputable would not enable us to test the certification hypothesis, since it is based on the availability of private (unobservable) information. This is true for both certification channels. Thus, we would observe the actual effect only after controlling for the non-randomness of borrower-lender match. This is done using the Heckman correction technique (Heckman, 1979), as presented below. If we do not control for this potential source of self-selection, we may merely measure a *clientele effect* specific to reputable arrangers, which may be positive or negative.[8] This is what is captured by merely including a dummy variable about the reputation of the lead arranger in the regression equation.

Note that the econometric procedure is different from the endogeneity problem often encountered in corporate finance studies. While both use the 2SLS technique to adjust for their own bias, the adjustment extracted from the first-stage regression is different (Li and Prabhala, 2005; Puri, 1996). For the Heckman correction, we compute the Inverse Mills ratio (denoted as *lambda*) as measure of private information. Unlike the endogeneity correction, this is a non-linear transformation of the residual term. The first-step regression (selection equation) is a standard Probit regression; the second regression an OLS that includes the Inverse Mills ratio extracted from the first-step regression to replace the dummy variable that accounts for whether or not the given arranger is reputable.

[7] Further signal mechanisms such as debt maturity yield similar conclusions (see, for example, Flannery, 1986; Diamond, 1991; and Wei, 2005) from the perspective of lead arrangers (not borrowers).

[8] When not controlling for this self-selection bias, we may obtain opposite results under the certification hypothesis. Therefore, in the presence of informational advantages for more reputable arrangers, it is not

3. DESCRIPTION OF DATA AND VARIABLES

For this study, we used Loan Pricing Corporation's *DealScan* database, which comprises data on a large sample of syndicated loans done since 1987. This database provides information on the structure of the deals (including positive and negative covenants), the borrower, the arrangers and syndicate members. We limit our sample to deals that include a tear sheet and for which we have complete information on our relevant variables. Tear sheets are documents that are derived from the loan documents and provide comprehensive details on the terms and conditions of deals. Tear sheets allow crosschecking of the information provided by the main database (downloadable in spreadsheet format), if needed, and provides much of the missing information on deals.[9] The time period considered is 1987-2005. The final sample includes 2,368 observations. The unit of observations is a loan facility (i.e., a tranche), given that some loans are raised in more than one tranche. In this case, each tranche has separate terms and thus must be considered separately.[10]

Table 1 provides the definitions of variables. One of our main variables is the distinction between top tier arrangers and other arrangers. We define a bank as a top tier arranger in a particular year if it was one of the biggest market players in the year before the considered loan transaction. To construct this dummy variable, we proceeded as follows. We first calculated the market share of all the market participants for each year, based on the total annual deal amount done. The variable *Top Tier Bank* then takes the value of one if at least one lead arranger is on the list of the three biggest players in the year before the considered deal. For the years prior to 2000, we used the five largest players, given that the lack of consolidation makes the cutoff of the top three less clear. This means that the list of top tier

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possible to investigate the hypothesis without controlling for self-selection bias. We examine this in the empirical section of the paper.

[9] For instance, the name of the lead arranger is not always mentioned in the actual database (especially for earlier transactions). However, this information is always reported in the tear sheet, either directly or in the form of comments. Where information was missing, we checked whether it was in the tear sheet. This was done for the most important variables. For instance, some values of fees are only reported in the tear sheet. Not double-checking this information would lead someone to interpret no information in the database as an absence of fees, which at times may be wrong. Therefore, limiting the sample to observations with tear sheets guarantees a sample with more reliable information. However, it creates a sample bias towards larger deals, since smaller deals rarely have a tear sheet provided. Also, it forces us to stop the analysis in 2005, data at which no tear sheets are provided anymore.

[10] In the empirical analysis, standard deviations of coefficients will be clustered at the facility level whenever feasible.

banks is updated every year based on market share in the previous year.[11] We also corrected the values for all mergers and acquisitions that took place in the commercial banking industry.[12]

The dependent variables for the structure of loan contracts are the spread and various restrictive covenants. We use the spread of the loan in basis points above the LIBOR rate (the main rate for interbank deposits). All loan contracts included in the *DealScan* database are based on this same spread. This also eliminates the need for controlling for levels of interest rate in the regression analyses. For the analysis of arranger fees, we consider the two most important fees at the time of deal arrangement: upfront fees and commitment fees. Our variable on fees takes the sum of both, giving the total basis points.

Finally, for all the listed companies, we collected information on large shareholders at the time the deals were done. Using the proxy statements from the Securities and Exchange Commission (SEC) Filings & Forms (EDGAR), we constructed two variables: the size of the largest blockholder and the number of blockholders. In this paper, a blockholder is any shareholder with at least 5% ownership in the borrowing company.[13] These variables are included in some of the specifications since they may capture the degree of monitoring needed by lenders. Creditor-shareholder conflicts may appear if the borrower has a concentrated ownership, which may require more monitoring. If top tier banks were better monitors, we would expect a positive effect. Similarly, such conflicts potentially affect the optimal syndicate size.

[11] Two points are worth being mentioned. First, this approach of identifying top tier banks is the same as that of, for example, Megginson and Weiss (1991), and Asker and Ljungqvist (2006). However, Fang (2005) follows a different approach for the public bond market. She only constructs a single league table that comprises all deals of the complete time period considered so that the list of top tier banks remains constant over the complete time period. This is cannot be done here, given the changes in annual rankings observed in the first half of our time period (cf. Table 3, Panel A), and the mergers and acquisitions among banks in more recent years. And second, some studies (e.g., Megginson and Weiss, 1991) measure reputation with market shares directly, without transforming the league tables into a dummy variable. This allows having a continuous variable and avoids setting an arbitrary cutoff level on how many arrangers should be considered as reputable. The drawback is that it does not enable to adapt the variable for possible self-selection bias; this requires a binary variable. Thus, we employ the former measurement.

[12] As robustness check, we performed the analysis by taking the top 5 lenders for each year (instead of top 5 until 1999 and top 3 for follow-up years). The main results are qualitatively similar. Results are available from the authors upon request.

[13] The SEC filings only record shareholders that hold at least 5% of outstanding shares (www.sec.gov).

4. SYNDICATED LOAN MARKET

4.1 Development of the Market

In this section, we describe certain characteristics of the syndicated lending market in the US and describe how its landscape evolved over the period 1987 to 2005. The syndicated loan market, which brings together the primary loan distribution process and secondary loan market, is a widely used channel for large corporations and mid-sized firms. Syndicated credits are a hybrid of private and public debt involving the sale of a loan to a group of commercial banks arranged as a syndicate. The nature of the syndicated loan market implies a banking model in which banks are mostly concerned with deal-specific transactions.

The development of syndicated lending first developed in the US in the late 1980s. Between 1986 and 1989, a new type of transaction form, the leveraged buyout (LBO), was widely used to acquire public companies. In order to manage the lending volumes, large New York commercial banks established a syndication process which resulted in underwriting groups arranging, underwriting and distributing non-investment grade loans to a group of institutional participants. The market for investment grade syndicated loans grew in the early 1990s when banks, due to a change in the credit cycle, became less interested in financing corporate acquisitions and more interested in arranging loans for lower-geared borrowers. Syndicated lending to top tier corporate firms grew strongly throughout the 1990s as companies took advantage of the new liquidity in the secondary loan market to access funds for general corporate purposes (Jones et al., 2005). The increasing tendency for banks to trade credit participations on the secondary market was reflected in the prevalence of transferability clauses in loan contracts (Drucker and Puri, 2009). The total size of the US secondary market was 25% of total loans between 1993 and 2003 (Gadanecz, 2004). In some respects, the syndicated lending market resembles the public debt market in terms of the notable division of the market between investment and non-investment grade lending.

A new pattern in the syndicated loan market developed between 1995 and 1997 when institutional investors began to accept syndicated loans facilities as an alternative to bonds. As a consequence, syndicated lending increased from $1.2 trillion in 1996 to almost $2.1 trillion in 2001, with gross issuance of facilities increasing from $214 billion in 1990 to $1,196 billion in 2001 (Armstrong, 2003). Refinancing of new facilities also increased in

trading volume, totalling approximately US$ 145 billion in 2003, with distressed loans making up a large share of the market (Gadanecz, 2004).

Over the last decade and a half, since the US banking deregulation, the US syndicated loan market has clearly become a major source of financing on behalf of a range of different borrowers. In particular, acquisition-led lending played an important role in the early years and provided the market with an important stimulus to introduce syndication to structure the issuance of loans. During the mid-1990s, in response to enormous demand, the market for syndicated loans for the investment-grade sector provided a complex array of facilities to meet the changing needs of general corporate borrowers. More recently, leveraged lending for acquisition-related transactions has grown to reflect changes in mergers and acquisitions, and the private equity market. While the demand for syndicated loans will continue to fluctuate across some sectors, the continuing demand for primary loans by corporate borrowers and the deepening of the secondary market suggest that the development of this sector of the market will continue.

4.2 Market Share of Commercial Banks

Table 2 shows a list of the top commercial banks involved as arranging or participating banks in the syndicated loan market during the 1991-2005 and 2001-2005 time periods, by number of deals and amount arranged. In the US market, the syndicated loan market is highly concentrated. The top three domestic banks, JP Morgan Chase, Bank of America and Citigroup, accounted for about 69% of all deals during the 1991-2005 period.

Table 3 gives further insights into how the syndicated loan market has evolved over time to eventually lead to the highly concentrated market as can be seen today. The table shows market share (calculated for deal amounts) of the largest, three largest and five largest banks in each year. Market concentration increased over time, with the three largest arrangers taking 60.8% of the deals in 2005 as compared to 40.6% in the late 1980s (Panel A). Moreover, while there were changes in the top arrangers over time in earlier years, there has been little change in the top three rankings in the latter years, with JP Morgan Chase taking the first position, Bank of America the second and Citigroup the third.

Much of this shift in concentration has been driven by mergers and acquisitions. In Table 2, all the deals of the acquired banks were imputed to the acquiring bank. This largely explains the disappearance of some banks in the rankings provided in Table 3, Panel A. For instance, Chase Manhattan Bank acquired Chemical Bank in 1996, which subsequently was acquired by JP Morgan in 2000. Further, major mergers and acquisitions in the US commercial banking industry are listed in Panel C of Table 3. Panel B of Table 3 presents the evolution of syndicate structure over the same time period.

Tables 2 and 3 illustrate the changes in the contemporary loan market over the period 1987 to 2005. During the 1990s, key restructuring changes in both segments of the loan market distinguished it from the public bond market in many respects. First, the role of banks in the loan market was very different. It was not limited to intermediation but rather arrangers usually retained the largest fraction of the deal after the transaction was completed. In the bond market, underwriters primarily played the intermediary between the borrower and a large number of investors, each buying a small fraction of the securities issued. The exact content of a deal was, therefore, of much greater interest to loan arrangers than bond underwriters. Second, the latter seemed to be less concentrated at the top. Indeed, Fang (2005) estimated that the five largest bond underwriters in the US held a market share of 60% for the period 1991-2000, while the top five US lenders accounted for about 75% of the market during the same time period. Moreover, the distinction between top tier bond underwriters and other bond underwriters seemed less clear as the decay is relatively smooth. This contrasts with the private debt market, where there is a sharp drop after the top three (Table 2). Third, Fang (2005) identified 51 unique bond underwriters in the US during the same period 1991-2000. For private debt, the number of lenders is by far larger. Finally, as you would expect for the US, the players are quite different due to the regulations. The top tier bond underwriters are Goldman Sachs, Merrill Lynch, Morgan Stanley, Salomon Brothers, CSFB, Lehman Brothers, JP Morgan and Donaldson, Lufkin & Jenrette (Fang, 2005). Their private debt is reported in Table 2. However, the major players in the US private debt market are not the same as those in the US public bond market.

5. ANALYSIS

In this section, we first present summary statistics of the sample. In the multivariate analysis that follows, we then investigate the effect of having a top tier bank as a lead arranger on the structure of loans, the level of spread and the inclusion of restrictive covenants in particular. We further investigate the impact on arranger fees to examine whether top tier arrangers charge higher fees for arranging loans. Given the observed loan contracts, we then examine how top tier lead arrangers structure their lender syndicates and choose their degree of retention in the loans they arrange.

As in many related studies (Puri, 1996; Gande et al., 1997, 1999; Fang, 2005),[14] we use Heckman two-stage selection models to estimate the impact of top tier banks on contracting (Heckman, 1979; Hamilton and Nickerson, 2003).[15] This is due to the fact that reputation could be related to private information that may lead to self-selection. Our empirical predictions rely on the assumption that more established arrangers possess superior information. In this case, the deals done by top tier banks may not be a random sample. However, we are not able to directly observe the relevant private information. As indicated later, our results exhibit a strong self-selection bias that justifies the use of this methodology. To demonstrate this, we also provide ordinary least squares (OLS) estimations that do not take into account self-selection.

It is important to stress the difference in interpretation between the simple OLS estimation and the one that controls for self-selection. The first one gives us information as to whether top tier banks on average offer better terms to borrowers. The second one examines the impact of private information—and thus reputation—by comparing the observed outcome with the one that would have occurred if top tier arrangers had not had private information, which in equilibrium we would not observe if self-selection occurs. What does this mean for the certification hypothesis? In equilibrium with informed and uninformed arrangers, the best borrowers self-select to be financed by informed arrangers and the other borrowers by uninformed ones.

[14] See also Li and Prabhala (2005) for a general discussion on the use of this type of model in corporate finance.
[15] Alternative estimation methods exist to account for possible selection biases, including a maximum likelihood version of the Heckman correction. More recently, Wintoki et al. (2010) offer a solution for related endogeneity issues in a dynamic context. Here we use the Heckman two-step method that is traditionally used in the literature that most closely related to ours.

While exclusion restrictions may not necessarily be needed in our Heckman two-step regressions due to the non-linearity the Inverse Mills ratio, we nevertheless use a different specification than in the second regression equation. In practice, an identification problem may still arise if the non-linearity is not large enough (Li and Prabhala, 2005; Hamilton and Nickerson, 2003). We therefore use the two variables *Sales* (as a measure for borrower size) and *Previous Loan Dummy* in the Probit regression; they are however not included in the second-stage regression. Following Fang (2005), we also use the variable *Investment Grade Dummy* instead of dummies for each rating to further enhance the quality of identification; individual dummies are used in the second-step regression. This was also done for all other Heckman estimations done throughout this study. *Sales* are likely to affect selection (i.e., *Top Tier Bank* dummy in the first-stage regression) but not *Spread* as it is not necessarily related to performance (and thus the borrowing terms). The variable *Sales* instead measures well the size of the borrower. It is likely to correlate with the market share of the lender, and larger companies may find it easier to access the largest lenders and thus the most reputable ones. We therefore expect a positive effect on the likelihood of having loans arranged by a reputable bank. In contrast, small firms may need to negotiate with local banks. This same variable was also used as part of the identification strategy by Fang (2005) for controlling for self-selection in the bond market. Along similar veins, a borrower that already received a loan in the past from a given bank may be more prone to receive further funding from this same bank. This view is in line with a bank relationship hypothesis (Boot, 2000; Boot and Thakor, 2000). This is captured by the variable *Previous Loan Dummy* that equals one if the borrower already received a loan from the considered bank. If this previous loan was from an established lender, it is more likely to receive another loan from the same reputable lender.[16]

To our knowledge, no test of exogeneity exists for the Heckman two-step estimation procedure (i.e., similar to the Sargan test for standard 2SLS endogeneity estimations). Still, it is important to note that the quality of our estimations ultimately rely on the specification of the first-stage regressions and on the assumption that our additional variables are uncorrelated with the residuals of the second-step regression. As in most corporate finance problems, variables are rarely fully exogenous. However, we believe that if some endogeneity may exist here with the variables *Sales* and *Previous Loan Dummy*, a significant part should be indirect, as many of the effects may be captured by the remaining variables included in the second-

[16] As robustness we further used the number of previous loans obtained instead of the *Previous Loan Dummy*,

stage specification. For instance, firm size (as proxied by *Sales*) is also in part captured by the industry dummies included as well as the variable *Borrower is a Parent Company* (dummy). It also correlates with *Loan Amount*.[17]

Finally, note that in all the regressions (both equations) we include controls for market conditions such as the Nasdaq Composite Index (in natural log), industry dummies (using 12 categories in total) and year dummies.

5.1 Summary Statistics

Table 4 provides summary statistics of our sample as well as sub-samples. It highlights a number of interesting facts. First, 56.3% of loans involve at least one top tier bank as lead arranger. (recall that the variable *Top Tier Bank* is equal to one if at least one lead arranger is top tier bank.) This percentage is roughly the same size as the average market size of top tier banks (see rankings in Tables 2 and 3).

Second, the lead arranger holds on average 24.7% of the total loan amount after the syndicate is structured. A top tier lead arranger retains significantly less in the syndicate (19.6% versus 31.2%). This suggests that lead arrangers retain a significant fraction of participation rights in the loans they arrange, but that top tier banks are able to sell a substantially larger fraction to junior banks participating in the syndicate.

Third, loans issued by top tier lead arrangers differ in from loans provided by other arrangers with respect to spreads. The average spread is about 35 basis points lower for deals arranged by the top tier banks (165.0 versus 200.6 basis points). Also the loan size is much larger (note also that this amount is the tranche loan; when focusing at the loan level, the average amounts are US$ 992.4 million for loans arranged by reputable banks versus US$ 489.2 million for the others). Arranger fees are on average about 38 basis points, which is significantly lower in magnitude than the loan spread. Moreover, 68.4% are tranched loans. However, this does not

which yielded similar results.

[17] One particular concern may be with respect to the variable *Previous Loan Dummy*, since it may be correlated with the extent of unobservable information. This concern was in particular raised by the referee, who we thank for this worthwhile comment. To check for this, we also included the variable in the second-stage regression to see whether it has explanatory power for the *Spread*. It turns out that this is not the case in most of the specifications. Regardless the sub-sample considered however, the coefficient of the Inverse Mills ratio remains significant and strong. Results are available upon request.

mean that the majority of the loans are actually tranched, since tranching is clustered within a smaller subset of loans. This large percentage is primarily attributable to the fact that our unit of observation is a tranche and not a loan.

Finally, top tier arrangers are less involved in arranging deals where the borrower has either no S&P rating or lacks an investment grade (i.e., a grade of BBB or higher). Therefore, top tier arrangers are more involved in lending to companies with an investment grade. This is consistent with the previous finding that spreads are lower, possibly due to lower risk transactions.

5.2 Deals Done by Top Tier Banks (1st Stage Regressions)

Table 5 presents the results on the likelihood of having a top tier bank as lead arranger. This analysis is useful in follow-up analyses, as we use self-selection models to estimate the impact of top tier arrangers on contract characteristics, which requires estimating the likelihood of having a specific transaction arranged by a top tier bank. These Probit regressions are at the same time the first-stage results of the two-step estimations.

Columns (1) – (5) in Table 5 show the results for the full sample. In sum, top tier banks are more likely to arrange larger deals (variable *Loan Amount*). This is in line with the view that large banks are necessary for large transactions. Moreover, borrowers with investment grade are more likely to raise private debt from more reputable arrangers. Both of these results are robust to alternative specifications as shown in the table. On the other hand, concentrated ownership does not seem to matter: neither the variable *Size of Largest Block* nor *Number of Blockholders* is significant.[18] Also, larger firms (measured by *Sales*) are more likely to have their loans arranged by reputable banks, which may be explained by their easier access to large, more reputable banks.

In Regressions (6) – (8) of Table 5, we show the results for different sub-samples: Regression (6) for deals with investment grades; Regressions (7) for deals that do not have an investment grade (i.e., either having no rating at all or a rating below BBB); and Regressions (8) for

[18] The main reason for including these variables is to determine whether or not more established arrangers are needed when the borrower has concentrated ownership and thus may require more monitoring. If top tier banks are better monitors, we would expect a positive effect.

deals with ratings below BBB. Again, the largest deals are most likely to be arranged by top tier banks, regardless of the sub-sample considered.

At the bottom of Table 5, we provide F-statistics for the exclusion of our two additional variables (*Sales* and *Previous Loan Dummy*) in order to assess relevance. In all the cases, tests are highly significant, expect for Regressions (6) and (8). This indicates that both variables have strong explanatory power in general, but we need to be more cautious about results pertaining to sub-samples. The identification however does not only rely on these two variables, unlike the standard 2SLS estimations (Lee and Prabhala, 2005, and Bascle, 2008). For Heckman two-step self-selection estimations, additional identification stems from the non-linearity derived from the first-step regression when calculating the Inverse Mills ratio. In addition, we follow the strategy used by Fang (2005) in that we include in the second-step regressions dummy variables for each type of S&P rating instead of the *Investment Grade Dummy* used in the first-step regression. Still, one must recognize that the identification strategy in the Heckman two-step procedure relies on the quality of the first-step specification and its non-linearity. To our knowledge, no straightforward test exists to assess the exogeneity and validity as in the case of the traditional 2SLS estimation method for simultaneity (Li and Prabhala, 2005, and Bascle, 2008).

5.3 Effect on Loan Spread (2nd Stage Regressions)

In this section, we examine the effect of the presence of a top tier lead arranger on contract design. Given that contract design is multi-dimensional, we examine the effect of the presence of a top tier arranger on the inclusion of covenants related to free cash flow problems, voting rights, shareholder-debtholder problem, financial ratios, as well as on the negotiated spread. We control for a number of borrower characteristics, such as the borrower's rating and deal type. Rating is used as a measure of risk. The number of observations varies depending on the information availability of each dependent variable.

Table 6 shows the results on the level of the spread (above the LIBOR rate). From the simple OLS estimation (Regression (1)), it appears that top tier arrangers provide loans at a lower spread than other arrangers. The coefficient is negative and significant at the 1% level. This supports the certification hypothesis. However, as mentioned before, it primarily captures the clientele effect and does not take into account the availability of private information. When

controlling for self-selection (Heckman two-step estimations), we in fact obtain opposite results (the parameter *lambda*, which refers to the inverse Mills' ratio).

For the full sample (Regression (2)), the parameter lambda is significantly positive at the 5% level. The fact that we obtain very different outcomes from the two estimations clearly indicates that top tier arrangers are able to self-select deals. While top tier arrangers on average do charge lower spreads, it is largely due to self-selection. This thus leads to a prediction opposite to that offered by the certification hypothesis. The selected borrowers, therefore, are charged higher spreads than in a scenario where reputation does not matter. This means that the most established lenders use their position not to certify but rather exploit borrowers through the market power they enjoy as one of the largest arrangers of syndicated loans. How can this result be interpreted? One likely possibility is that top lead arrangers instead certify quality of borrowers through the second channel, namely, through higher retention of the loans arranged. Therefore, we still have to examine this other channel before rejecting the certification hypothesis. Here, this means that lead arrangers use the resulting market power from their private information to extract rents from some borrowers. In fact, borrowers may be willing to pay higher spreads if a loan that is arranged by a top tier bank sends a positive signal to investors in the equity markets. Cook et al. (2003) provide evidence for such benefit, suggesting that borrowers may indeed be willing to accept higher spreads from certifying loan arrangers.

Some additional results are worth mentioning. First, the spread is lower if the borrower is the parent company as opposed to a subsidiary. This is in line with the notion that loans are better secured if issued by the parent company, since more assets may be available. Second, the better the rating of the borrower, the lower the spread. This is in line with the intuition that less risky borrowers obtain better terms. However, it appears that companies without any S&P rating obtain a lower spread than those with a rating. This suggests that the pool of borrowers without rating is of better quality than the pool of rated companies without investment grade (i.e., rating below BBB), where the spread can be significantly higher.

Regressions (4) – (12) show the same model specification but for different sub-samples. Overall, these results strongly suggest that top tier arrangers are able to exploit their dominance with borrowers that do not have an investment grade, either because they have a

rating below BBB or no rating at all[19] (see Regressions (5) and (8)), but not the other borrowers. For the very best deals—i.e., those with an investment grade—competition is fierce. This suggests that borrowers with investment grade are not willing to pay more for taking loans from top tier banks, but others do—possibly as a way to enhance their profile. Indeed, if top tier banks are able to select the best deals, obtaining a loan from a top tier bank may improve the credibility of a company that does not have an investment grade (Regressions (5) and (6)) or that has no rating at all (Regression (8)). They are then ready to pay a premium. On the other hand, companies with an investment grade already have creditworthiness from their high rating (Regression (4)). This limits top tier banks in charging higher spreads to the most credit-worthy borrowers.

Further, worthwhile analysis pertains to deals done after the change in US regulations in the mid 1990s that triggered a wave of important mergers and acquisitions in the commercial banking industry (see Section 4.2). Since competition among the largest banks was reduced, we may expect the market power of the top tier arrangers to have increased during the more recent sample in our paper. In line with this intuition, we find that top tier banks were indeed primarily able to extract higher spreads during the second time period (after 1995) but not in the first (Regressions (9) and (10)).

The last analysis deals with the possible presence of asymmetric information that may be particularly severe for some subsets of deals considered. We therefore split the sample according to whether or not the borrower is listed. The intuition is that listed firms are more scrutinized by analysts and thus are more likely to exhibit less asymmetric information than firms that are not listed. We expect the impact of reputation to be strongest for firms that are not listed, since these are likely suffering the most from asymmetric information. In our sample, about half of the loan transactions are made by listed firms (1210 listed versus 1158 non-listed). Our results show that whether the borrower is listed does also matter (Regressions (11) and (12)). While both types of firms are affected by the reputation of lead arrangers, private borrowers face higher spreads than listed ones. This confirms results that private firms are more opaque and exhibit greater asymmetric information problems (Sufi, 2007).

[19] This is qualitatively similar to the findings of Sufi (2007), who categorizes borrowers without rating as those

Finally, let us mention that we also investigated the impact of lead arranger reputation on other loan characteristics, in particular the inclusion of certain restrictive covenants and loan maturity (results not reported here). We could find almost no effect on these other loan characteristics, except for loan maturity that tended to be negative. Overall, it is worthwhile mentioning that these findings go against the idea that top tier arrangers might trade off restrictive covenants for a higher spread in a different way than other arrangers, as suggested by the *Agency Theory of Covenants* or the *Costly Contracting Hypothesis* (see for a related discussion, for example, Bradley and Roberts, 2004; Reisel, 2004; and Chava et al., 2009). These hypotheses postulate that restrictive covenants and spread are substitutes. Thus, some arrangers may differ in their preferred mix of covenants and spread. Given that lead arranger reputation here affects spread but not covenants, our analysis does not simply capture some form of variation of these hypotheses. At the same time, our results do not refute these hypotheses either, since we do not directly test them. However, our evidence indicates that the picture is much richer than what has been suggested by previous studies.

5.4 Effect on Arranger Fees

These findings raise important questions about the fee structure charged by top tier arrangers compared to other arrangers. Given that they charge higher spreads, do they give up some of these benefits to borrowers through lower fees, or are they capable of extracting further costs through extra fees? Fang (2005) found that reputable bond underwriters offer lower yield spreads to companies but indeed charge higher underwriter fees, making their certification ability valuable.

The results on arranger fees for the syndicated loan market are provided in Table 7, and summarized as follows. Fees on average tend to be about five basis points lower for deals arranged by top tier arrangers, suggesting that they indeed pass on to borrowers some of the benefits they extract through higher spreads. However, this result is only weakly significant when controlling for the non-randomness of borrower-lender matches. Only borrowers with credit ratings benefit from these lower arranger fees (Regression (6)). Interestingly, these are precisely the group of borrowers that were not charged higher spreads due to arranger reputation. In line with previous results, this suggests that borrowers requiring certification

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with the highest asymmetric information.

are paying most for having their loans arranged by top tier arrangers, most likely because they are also benefiting most from the resulting certification. However, these reduced fees appear to have largely disappeared subsequent to the consolidation wave (Regressions (8) and (9)), perhaps due to the increased power of reputable banks after the various acquisitions among the largest arranging banks.

5.5 Effect on Structure of Loan Syndicate

From the contracts observed, we now analyze the impact on the syndicate structure. We analyze how this impact affects the syndicate size (number of lenders in the syndicate) and the fraction of total deal amount retained by the lead arranger. Again, we control for a number of borrower characteristics, such as the borrower's rating and deal type, as well as market conditions. As before, we use a Heckman two-step procedure to estimate the effects, together with the OLS estimations.

The results on the structure of the loan syndicate are shown in Table 8. Regressions (1) and (5) in Panel A use standard OLS estimation, and are again evidence the presence of self-selection bias. This indicates that not correcting for self-selection bias would again yield wrong conclusions with regards to the impact of bank reputation. Regression (2) shows that top tier banks build smaller syndicates than other banks, although we found earlier that they also arrange the largest deals. This contrasts with the results of earlier studies that came to the opposite conclusion, such as that of Lee and Mullineaux (2001) and Sufi (2007), who, however, did not control for self-selection bias. Indeed, estimations of the same specification without Heckman correction (Regression (1)) also suggest in our sample that top tier banks would lead to larger syndicates (on average about two lenders less). While we do not refute results from previous studies, some of the effects may however come from the fact that lead arrangers may strategically select those borrowers for which they have private information at hand before the screening process even begins. This leads to a non-random sample of observations, since the intensity of investigation and the degree of monitoring needed may not be randomly distributed anymore between informed and non-informed lenders. We adopt the methodology used by Fang (2005) and others, who consider this correction as important. While many studies show qualitatively similar results after a self-selection correction, in the context studied here this critically affects results for syndicate structure (Table 8) but also loan spreads (Table 6).

The effect of the structure of the loan syndicate remains statistically significant when including the fraction of the deal amount retained by the lead arranger. Note, however, that this variable is endogenous so that we need to be careful. At the same time, a top tier arranger on average holds a significantly larger fraction of closed deals than other lead arrangers (Regression (6), Panel A of Table 8). This indicates that top tier arrangers sell a smaller stake of the loan to other banks, possibly either because of the fact that these are better deals or because there are fewer lenders participating in the syndicate.

Since both the variables *Number of Lenders in Syndicate* and *Fraction of Deal Retained by Lead Arranger* are simultaneously determined, we propose an alternative analysis approach that circumvents the endogeneity issue at hand. We compare the fraction actually held by the lead arranger (the variable *Fraction of Deal Retained by Lead Arranger*) with the fraction that the lead arranger would hold if the loan were shared uniformly among N lenders; i.e., the fraction 1/N. For example, if there were N=5 partners in the syndicate, the loan would be shared uniformly if each held 20%. The dependent variable used here is the ratio of both fractions (*Fraction of Deal Retained by Lead Arranger* divided by 1/N; i.e., *Fraction of Deal Retained by Lead Arranger* $\times$ N). This measure corrects for syndicate size by adjusting the dependent variable directly instead of including a variable on the right-hand side. A positive effect of the presence of a top tier arranger then means that the latter retains a larger fraction of the deal amount than under the equal sharing rule of 1/N.

The results on fraction held by largest lead arranger according to number of lenders are provided in Panel B of Table 8. The OLS estimation indicates no significant impact (Regression (9)). When adjusting for the non-randomness of borrower selection by top tier arrangers, we still find no statistically significant impact in the full sample (Regressions (10) and (11)). This suggests that overall top tier arrangers do not need to signal borrower quality through this secondary channel. This result is robust when controlling for the presence of a large blockholder in the borrowing firm (Regression (11)).

However, we find that top tier banks retain significantly less than under equal sharing for the sub-sample of loans for borrowers with an investment grade (Regression (12)) or at least with a credit rating (Regression (15)). In other words, the impact of top tier arrangers is significant for selected sub-samples where certification is least important, namely, for borrowers with

investment grade (see Regressions (12) – (16) in Table 8, Panel B). Moreover, we find the opposite effect for borrowers facing the strongest asymmetric information, namely, those without any rating. These same borrowers are also the ones that get charged the highest spreads. Results show that (Table 8, Regression (16)) reputable arrangers retain larger fractions of the loans of these borrowers, which is in line with the notion that arrangers retain more as a way to certify the quality of such borrowers. This leads to the conclusion that certification in the syndicated loan market is not through spread but higher retention in the syndicate (our second channel). This result contrasts strongly with the public debt market (Fang, 2005), but concurs with the differences between the two markets. While arrangers only serve as intermediaries in the public market, in the private market they typically participate in the syndicate, providing borrowers with this second channel through which certification may occur.

In this study, we have explored two potential certification channels that are, however, likely to be jointly determined: (1) contracting; and (2) loan retention by the lead arranger in the syndicate. Analyzed individually, we found support for the second channel. Given the difficulty in controlling for endogeneity in our particular context, we estimated the previous regressions on spreads for the sub-sample where the lead arranger eventually retains a *high* fraction of the loan in the syndicate and the sub-sample where the lead arranger retains a *low* fraction. To separate these two sub-samples, we set up the distribution of the variable *Fraction of Deal Retained by Lead Arranger* and calculate the percentiles of the distribution. As the threshold value for the first sub-sample, we use the fourth quarter of the distribution (i.e., all the observations above the 75th percentile); for the latter sub-sample, we take the first quarter (i.e., all observations in the lower 25th percentile of the distribution). Table 9 provides the results of the regression estimations, which suggest the likely presence of endogeneity.

Due to the possible substitutability of both certification channels, we would expect a positive relationship between higher retention of the lead arranger and loan spreads charged. We find indeed that spreads are higher for reputable arrangers, when controlling for the non-randomness, in the sub-sample where lead arrangers eventually retain larger fractions of the loan in the syndicate (Regression (4)). Interestingly, again this result only holds for loans arranged for borrowers that are benefiting most from having their loans arranged by a top tier bank, namely, borrowers without an investment grade (Regression (8)). The effect is slightly

negative for the sub-sample of borrowers with investment grade where arrangers also retain a larger fraction later on in the syndicate (Regression (6)), though only marginally significant. Overall, these results are in line with previous findings that certification primarily occurs for low-rated borrowers, which are also charged higher spreads.

6. CONCLUSIONS

In this paper, we have examined the relationship between the reputation of top tier arrangers and the design of loan contracts and syndicate structure. Using a framework that controls for endogenous matching between arrangers and borrowers, we show that syndicated loans placed by top tier banks are characterized by higher spreads for borrowers than when reputation does not matter. The different spreads offered by top tier arrangers that are observed are largely due to the fact that top tier arrangers can self-select the best borrowers, leaving the rest to other arrangers. Moreover, not only are these top tier arrangers involved in larger deals, but are more strongly linked with borrowers that exhibit higher credit ratings, which reinforce the idea that top tier arrangers can select deals of superior quality.

Our findings suggest that increased loan selectivity of top tier arrangers is positively related to higher spreads, which differs from the evidence reported for the public bond market. This pattern is further supported by our finding that top tier arrangers exploit their dominance with borrowers that do not enjoy an investment grade rating. This suggests that borrowers with investment grade are not willing to pay more for taking loans from top tier banks, but other borrowers may well do so, possibly as a way to enhance their credit profile. At the same time, our results support the notion that the market for syndicated loans is different from the public bond markets, where reputation is used as a certification mechanism by established underwriters as a mean to offer better pricing to clients. Indeed, we find support for the certification hypothesis at the syndicate structure level, if any. Since they are not simply intermediaries like bond underwriters, top tier arrangers can signal borrower quality not only from terms offered but also by holding a larger fraction of the deal. We show that after correcting for self-selection bias between borrower and arranger, certification appears to occur, however, only for borrowers without credit rating. This is consistent with the notion that borrowers that are in most need for certification and are most willing to pay for it.

In summary, we have been able to account for differences between the loans and syndicate structures assembled by top tier arrangers and other banks. We have provided explicit estimates about the size of the loan spreads and fees, accounting for the impact of top tier arrangers in obtaining superior pricing, and have shown that credit ratings account for the level of protective measures in syndicated loans. Finally, our study contributes to the debate on the importance of controlling for endogeneity and self-selection, a discussion that has gained increased attention again in recent years in corporate finance.

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Table 1: Definition of Variables

Variables	Definition
Loan Characteristics:	
Arranger Fees	Fees obtained by arrangers; defined as the sum of upfront fee and commitment fee (in basis points)
Spread	Spread of the loan in basis points above the LIBOR rate
Loan Amount	Size of the loan tranche in US$ millions
Lead Arranger Characteristics:	
Top Tier Bank	Dummy = 1 if at least one lead arranger is a top tier bank (as defined in Section 3)
Borrower Characteristics:	
Borrower is Parent Company	Dummy = 1 if the borrower is the parent company (and therefore equal to 0 if the borrower is a subsidiary)
Sales	Company's sales in US$ millions at date of deal closure (transformed in log)
Previous Loan Dummy	Dummy = 1 if borrower raised previously a syndicated loan and the deal is included in the sample
Size of Largest Blockholder	Fraction of outstanding shares held by the largest blockholder (equal to zero if the largest blockholder holds less than 5%)
Number of Blockholders	Number of shareholders that hold at least 5% of outstanding equity
Borrower's Rating:	
Borrower has no Rating	Dummy = 1 if the borrower has no S&P Rating Index. This proxies opaqueness of the borrower
AAA_Rating	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is AAA
AA_Rating	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is AA
A_Rating	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is A
BBB_Rating	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is BBB
Lower_Rating	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is not an investment grade (i.e., is below BBB) but has a rating
Investment Grade Dummy	Dummy = 1 if the S&P Rating Index of the borrower's senior debt is BBB or higher
Deal Type Dummies:	
Merger and Acquisition	Dummy = 1 if the deal purpose is to finance a merger and acquisition
LBO / MBO	Dummy = 1 if the deal purpose is to finance an LBO / MBO
Characteristics of Loan Syndicate:	
Number of Lenders in Syndicate	Number of participants in the loan syndicate, including lead arrangers
Fraction of Deal Retained by Lead Arranger	Percentage of the loan that is retained by the largest lead arranger in the syndicate

Table 2: League Tables of Banks for Two Different Time Periods

This table gives the ranking of the largest banks based on the total volume of syndicated loans. Reported values are based on the full sample of syndicated loans available in *DealScan* for the period 1991-2005 (45,149 observations). For syndicated loans, an equal fraction 1/N of deal amount was imputed to each participant in the syndicate (where "N" stands for the syndicate size). For banks that merged or were acquired, the amounts and deals previously done were included in the values of the new entity or acquiring bank, respectively.

	Time Period 1991-2005			Time Period 2001-2005		
Rank	Arranger	Amount (US$)	# Deals	Arranger	Amount (US$)	# Deals
1	JP Morgan Chase	6,402,060,029,139	10,923	JP Morgan Chase	2,951,682,866,274	4,324
2	Bank of America	3,392,439,423,031	11,702	Bank of America	1,830,499,745,881	5,104
3	Citigroup	2,449,922,165,300	3,170	Citigroup	1,565,939,809,659	1,623
4	Deutsche Bank	684,009,181,264	1,575	Wachovia Corp	408,633,868,859	1,501
5	Wachovia Corp	573,101,120,335	2,549	Deutsche Bank	323,554,297,830	554
6	CSFB	552,727,055,846	1,015	CSFB	278,527,243,793	506
7	Bank of New York	242,213,573,318	928	Barclays Bank	156,360,911,496	191
8	Barclays Bank	202,922,060,678	376	Lehman Brothers	146,558,061,917	234
9	Wells Fargo Bank	200,403,294,039	1,551	Goldman Sachs	138,176,089,256	223
10	Lehman Brothers	198,814,693,937	405	Wells Fargo Bank	131,748,246,019	963
11	Goldman Sachs	198,731,303,625	304	ABN AMRO Bank	94,969,009,354	639
12	UBS	191,794,064,090	494	Merrill Lynch	94,533,477,973	210
13	ABN AMRO Bank	164,317,936,110	1,051	General Electric Capital	88,050,597,950	660
14	Scotia Capital	158,202,101,253	533	BNP Paribas	82,827,446,093	293
15	Toronto Dominion Bank	143,905,053,532	394	Bank of New York	74,789,695,777	337

Table 3: Evolution of Syndicated Loan Market from 1987 to 2005

Panel A: Market Shares and Bank Concentration in Syndicated Loan Market

Reported values are based on the full sample of syndicated loans available in *DealScan* for the period 1991-2005 (45,149 observations). Market shares are based on loan amounts, not number of deals done. Abbreviations: ChemB = Chemical Bank, BT = Bankers Trust, BoA = Bank of America.

Year	No. of Deals in *DealScan* Database	Market Share of Largest Arranger	Market Share of 3 Largest Arrangers	Market Share of 5 Largest Arrangers	Five Largest Arrangers (in Descending Order)
1987-1990	2,433	0.148	0.406	0.552	Citigroup, Manufacturers Hanover Trust, BT, JP Morgan, ChemB
1991	734	0.187	0.396	0.541	Citigroup, ChemB, First Chicago, JP Morgan, BT
1992	1,060	0.184	0.400	0.545	ChemB, Citigroup, First Chicago, BT, BoA
1993	1,359	0.212	0.467	0.587	ChemB, Citigroup, JP Morgan, BT, Chase Manhattan
1994	2,141	0.219	0.462	0.593	ChemB, Citigroup, JP Morgan, BoA, Chase Manhattan
1995	2,617	0.254	0.454	0.577	ChemB, Citibank, JP Morgan, Chase Manhattan, BoA
1996	3,322	0.239	0.471	0.631	Chase Manhattan, JP Morgan, BoA, Citigroup, NationsBank
1997	3,975	0.282	0.485	0.634	Chase Manhattan, JP Morgan, Citigroup, BoA, NationsBank
1998	3,529	0.212	0.478	0.600	Chase Manhattan, BoA, JP Morgan, Citigroup, First Chicago
1999	3,487	0.300	0.591	0.678	Chase Manhattan, BoA, Citigroup, JP Morgan, Bank One
2000	3,831	0.322	0.631	0.725	JP Morgan Chase, BoA, Citigroup, CSFB, Bank One
2001	3,488	0.335	0.675	0.740	JP Morgan Chase, BoA, Citigroup, Bank One, CSFB
2002	3,463	0.316	0.640	0.725	JP Morgan Chase, BoA, Citigroup, Bank One, Deutsche Bank
2003	3,634	0.248	0.580	0.680	JP Morgan Chase, BoA, Citigroup, Bank One, Deutsche Bank
2004	4,256	0.302	0.657	0.756	JP Morgan Chase, BoA, Citigroup, Wachovia, CSFB
2005	4,253	0.263	0.608	0.697	JP Morgan Chase, BoA, Citigroup, Wachovia, Deutsche Bank
1991-2005	45,149	0.360	0.688	0.758	JP Morgan Chase, BoA, Citigroup, Deutsche Bank, Wachovia
1996-2005	37,238	0.346	0.685	0.757	JP Morgan Chase, BoA, Citigroup, Deutsche Bank, Wachovia
2001-2005	19,094	0.312	0.672	0.749	JP Morgan Chase, BoA, Citigroup, Wachovia, Deutsche Bank

Panel B: Structure of Syndicated Loans

Reported values are averages for the full sample included in the *DealScan* database, except for the two columns in italic (where the sample with tear sheets is used). For the *Percentage of Deals Arranged by at Least One Top Tier Arranger*, values are weighted by deal amount. For *Percentage of Deals with Investment Grade* and *Percentage of Investment Grade Deals Arranged by Top Tier Arranger*, only the sub-sample of the deals with a rating is used.

Year (or Period)	Percentage of Deals Arranged by at Least One Top Tier Arranger	Percentage of Deals with Investment Grade	Percentage of Investment Grade Deals Arranged by Top Tier Arranger	*Average Number of Lead Arrangers*	Average Number of Lenders in Syndicate	*Average Percentage of Loan Retained by Largest Arrangers*
1987-1990	0.561	0.540	0.195	*1.140*	4.540	*23.678*
1991	0.541	0.513	0.189	*1.128*	4.184	*15.213*
1992	0.515	0.516	0.238	*1.097*	4.499	*19.034*
1993	0.596	0.529	0.268	*1.059*	5.157	*13.698*
1994	0.625	0.572	0.344	*1.056*	5.795	*14.317*
1995	0.643	0.578	0.370	*1.055*	5.968	*15.712*
1996	0.669	0.473	0.341	*1.068*	5.830	*13.195*
1997	0.637	0.400	0.280	*1.030*	5.504	*19.102*
1998	0.623	0.352	0.259	*1.086*	5.100	*21.526*
1999	0.619	0.418	0.312	*1.054*	5.908	*23.431*
2000	0.643	0.514	0.413	*1.142*	5.867	*19.055*
2001	0.616	0.591	0.434	*1.237*	5.756	*28.915*
2002	0.610	0.574	0.393	*1.357*	5.682	*26.588*
2003	0.571	0.497	0.328	*1.208*	5.849	*16.858*
2004	0.608	0.396	0.287	*1.368*	6.131	*22.336*
2005	0.615	0.380	0.289		6.039	

Panel C: Major Mergers & Acquisitions of Commercial Banks in US

Chase Manhattan Bank
- Chemical Bank (acquired in 1996)

JP Morgan
- Chase Manhattan Bank (acquired in 2000 -- new name: JP Morgan Chase)
- Bank One (acquired in 2004)

Wachovia Bank
- First Union (merged in 2001)
- SouthTrust (acquired in 2004)

Bank of America
- Security Pacific National Bank (acquired in 1992)
- NationsBank (merged in 1998)
- FleetBoston (acquired in 2004)

Deutsche Bank
- Bankers Trust (acquired in 1998)

Wells Fargo Bank
- First Interstate Bank (acquired in 1996)

Table 4: Descriptive Statistics of Variables

All the variables are defined in Table 1. For the variable "Fraction of Deal Retained by Lead Arranger", a smaller sample was used to calculate summary statistics, due to limited information available. In particular, 1092 observations were used for this specific variable (609 done by top tier arrangers and 482 not).

Variable	Full sample			Sub-sample of deals for Top Tier Bank = 1		Sub-sample of deals for Top Tier Bank = 0		Difference in mean of both sub-samples
	Mean	Median	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	P-Value
Lead Arranger Characteristics:								
Top Tier Bank (dummy)	0.563	1.000	0.541	1.000	---	0.000	---	---
Fraction of Deal Retained by Lead Arranger	24.70	13.37	26.87	19.56	22.77	31.23	30.08	0.000
Borrower Characteristics:								
Borrower is Parent Company	0.878	1.000	0.327	0.859	0.349	0.902	0.297	0.001
Sales (not transformed in log)	2709.3	784.6	7666.3	3548.2	7924.5	1648.1	7194.2	0.000
Previous Loan Dummy	0.349	0.000	0.477	0.392	0.488	0.291	0.454	0.000
Loan Characteristics:								
Spread (basis points)	180.6	187.5	112.8	165.0	110.4	200.4	112.8	0.000
Loan Amount (US$ million)	417.3	200.0	757.6	538.9	942.0	277.5	440.1	0.000
Arranger Fees	38.55	22.50	54.55	34.31	54.31	43.92	54.42	0.000
Borrower's Rating:								
Borrower has no Rating	0.017	0.000	0.129	0.021	0.144	0.011	0.107	0.061
AAA_Rating	0.002	0.000	0.041	0.003	0.055	0.000	0.000	0.045
AA_Rating	0.007	0.000	0.082	0.011	0.102	0.002	0.044	0.006
A_Rating	0.074	0.000	0.262	0.104	0.306	0.035	0.185	0.000
BBB_Rating	0.152	0.000	0.360	0.181	0.386	0.116	0.320	0.000
Lower_Rating	0.453	0.000	0.498	0.438	0.496	0.473	0.500	0.086
Deal Type Dummies:								
Merger and Acquisition	0.378	0.000	0.485	0.367	0.482	0.392	0.488	0.210
LBO / MBO	0.116	0.000	0.320	0.119	0.324	0.113	0.317	0.670
Number of Observations	2368			1324		1044		

Table 5: Analysis on the Type of Deals Done by Top Tier Arrangers (1st Stage Regressions)

The dependent variable in all the Probit regressions is "Top Tier Bank", a dummy variable equal to one if at least one lead arranger is a top tier bank (as defined in Section 3). The method of estimation is the Probit regression. All the variables are defined in Table 1. A constant term is included in all the regressions, whose coefficient is not reported. Robust standard errors clustered at the facility (tranche) level are used. F-statistics refer to the test that the two variables Sales and Previous Loan Dummy are jointly equal to zero. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Borrower Characteristics:						Sub-sample for Investment Grade = 1	Sub-sample for Investment Grade = 0	Sub-sample for Lower Grades
Borrower is Parent Company	-0.15	-0.14	-0.14	-0.004	-0.0004	0.22	-0.21	-0.21
Loan Amount	0.0003 ***	0.0003 ***	0.0003 ***	0.0004 ***	0.0004 ***	0.0005 ***	0.0003 ***	0.0002 **
Sales	0.13 ***	0.12 ***	0.12 ***	0.12 **	0.12 **	0.09	0.13 ***	0.10 *
Previous Loan Dummy	0.09	0.07	0.09	0.13	0.14	0.05	0.11	0.06
Size of Largest Block				0.002				
Number of Blockholders					-0.03			
Borrower's Rating (Control Variables):								
Borrower has no Rating	-0.06	-0.05	-0.06	0.07	0.06		-0.10	
Investment Grade Dummy	0.16	0.16	0.16	0.39 ***	0.37 ***			
Deal Type Dummies (Control Variables):								
Merger and Acquisition	-0.12	-0.06	-0.12	-0.01	-0.02	-0.46 **	-0.03	-0.03
LBO / MBO	0.20	0.19	0.20	-0.14	-0.08	-0.57	0.28 *	0.29
Ln(Nasdaq Composite Index)	0.35	No	No	0.71	0.70	-0.43	0.41	-0.30
Industry Dummies Included?	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2368	2368	2368	1191	1210	556	1812	1073
Log Pseudo-Likelihood	-1459.05	-1499.63	-1459.98	-715.80	-725.82	-256.30	-1156.49	-677.51
Wald Chi-squared	145.35 ***	90.04 ***	142.85 ***	103.48 ***	105.80 ***	83.49 ***	86.80 ***	58.60 ***
F-statistic (excluded instruments are jointly 0)	14.60 ***	14.31 ***	14.19 ***	7.46 **	7.14 **	1.93	12.08 ***	3.25
Pseudo-R squared	10.20%	7.70%	10.14%	13.03%	13.11%	23.19%	7.88%	8.49%

Table 6: Regression Analysis on the Loan Spread (Panel A)

The dependent variable in all the regressions is "Spread" indicated in the loan agreement, defined as the rate (in basis points) above the LIBOR rate. All the variables are defined in Table 1. The method of estimation is the two-step Heckman selection model estimation, expect the first specification that is estimated by OLS (for comparison purposes). The first-step regression of the Heckman's selection models is based on the regression specifications as shown in Table 5 (and thus depends on the specific sub-sample considered). A constant term is included in all the regressions, whose coefficient is not reported. Heckman's two-step standard errors are used. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full Sample (OLS Regression)	Full Sample	Full Sample	Sub-sample Investment Grade = 1	Sub-sample Investment Grade = 0	Sub-sample of Deals w/ Low_Rating	Sub-sample of Deals w/ Rating	Sub-sample of Deals w/ no Rating
Lead Arranger Characteristics:								
Top Tier Bank (dummy)	-16.42 ***		-8.09					
LAMBDA (Inverse Mills' Ratio)		124.78 ***	124.73 ***	34.81	150.44 ***	172.34 **	89.52 ***	85.43 **
Borrower Characteristics:								
Borrower is Parent Company	-10.57 **	-24.06 **	-24.01 **	0.22	-31.80 **	-39.50 *	-20.63 **	-3.47
Loan Amount (million US$)	-0.02 ***	0.01 **	0.01 **	0.002	0.01	0.02	0.01 **	-0.01
Borrower's Rating (Control Variables):								
Borrower has no Rating	-42.85 ***	-47.93 ***	-47.69 ***		-51.21 ***			
AAA_Rating	-202.05 ***	-186.54 ***	-186.59 ***	-37.21			-202.55 ***	
AA_Rating	-164.36 ***	-161.45 ***	-161.51 ***	- -			-174.49 ***	
A_Rating	-147.71 ***	-135.64 ***	-135.65 ***	35.11 *			-150.04 ***	
BBB_Rating	-123.62 ***	-106.21 ***	-106.29 ***	60.79 ***			-118.33 ***	
Deal Type Dummies (Control Variables):								
Merger and Acquisition	-21.80 ***	-37.87 ***	-37.99 ***	-16.64 *	-38.66 ***	-32.93 **	-31.25 ***	-41.98 ***
LBO / MBO	43.59 ***	39.47 ***	39.41 ***	103.75 ***	40.73 ***	32.97	24.34 **	61.17 ***
Ln(Nasdaq Composite Index)	4.78	44.13	44.09	-20.83	84.33 **	22.21	15.23	114.18 *
Industry Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2368	2368	2368	556	1812	1073	1629	739
Wald Chi-squared		678.40 ***	679.96 ***	206.43 ***	255.66 ***	128.00 ***	837.12 ***	422.79 ***
F-Statistics	83.61 ***							
R-squared	42%							

Table 6: Regression Analysis on the Loan Spread (Panel B)

Variables	(9)	(10)	(11)	(12)
	Sub-sample of All Deals Done Before 1995	Sub-sample of All Deals Done after 1995	Sub-sample of Listed Firms	Sub-sample of Non-Listed Firms
Lead Arranger Characteristics:				
LAMBDA (Inverse Mills' Ratio)	-39.05	123.78 ***	77.68 ***	146.20 ***
Borrower Characteristics:				
Borrower is Parent Company	-28.28	-20.59 *	-13.35	-16.31
Loan Amount (million US$)	-0.01	0.01 **	0.01	0.01 *
Borrower's Rating (Control Variables):				
Borrower has no Rating	0.96	-47.99 ***	-43.65 ***	-39.83 ***
AAA_Rating	- -	-183.71 ***	-128.08	-212.97 ***
AA_Rating	-126.47 ***	-141.83 ***	-152.49 ***	-180.29 ***
A_Rating	-109.87 **	-126.51 ***	-130.12 ***	-145.46 ***
BBB_Rating	-100.53 ***	-99.54 ***	-85.66 ***	-140.21 ***
Deal Type Dummies (Control Variables):				
Merger and Acquisition	-55.97 ***	-27.52 ***	-27.53 ***	-49.04 ***
LBO / MBO	9.98	42.46 ***	41.04 **	19.14
Ln(Nasdaq Composite Index)	-177.49	31.11	88.11 ***	-7.36
Industry Dummies Included?	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes
Number of Observations	302	1908	1210	1158
Wald Chi-squared	287.41 ***	7835.09 ***	481.09 ***	343.59 ***

Table 7: Regression Analysis on Arranger Fees

The dependent variable in all the regressions is "Arranger Fees" indicated in the loan agreement, defined as sum of upfront fee and commitment fee. All the variables are defined in Table 1. The method of estimation is the two-step Heckman selection model estimation, expect the first specification that is estimated by OLS (for comparison purposes). The first-step regression of the Heckman's selection models is based on the regression specifications as shown in Table 5 (and thus depends on the specific sub-sample considered). Instrumental variables used in the first-step regression are "Sales" (as measure of firm size), "Tranched Deal (Dummy)" and "Previous Loan Dummy". A constant term is included in all the regressions, whose coefficient is not reported. Heckman's two-step standard errors are used. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Full Sample (OLS Regression)	Full Sample	Sub-sample Investment Grade = 1	Sub-sample Investment Grade = 0	Sub-sample of Deals w/ Low_Rating	Sub-sample of Deals w/ Rating	Sub-sample of Deals w/ no Rating	Sub-sample of All Deals Done Before 1995	Sub-sample of All Deals Done after 1995
Lead Arranger Characteristics:									
Top Tier Bank (dummy)	-4.07 **								
LAMBDA (Inverse Mills' Ratio)		-16.63	9.61	-1.50	-2.22	-36.44 **	11.51	8.78	-7.22
Borrower Characteristics:									
Borrower is Parent Company	-2.48	8.00 *	0.60	9.10	22.22 **	15.72 ***	-8.22	32.60 *	5.54
Loan Amount (million US$)	-0.002	0.002	0.002 ***	0.01 **	0.01 **	0.001	0.002	0.02 **	0.001
Borrower's Rating (Control Variables):									
Borrower has no Rating	-10.95 ***	-7.08 **		-6.78				-22.40	-10.20 ***
AAA_Rating	-38.56 ***	-51.27 **	-0.51			-58.68 **		- -	-42.71 **
AA_Rating	-45.42 ***	-61.65 ***	- -			-69.51 ***		-95.19 ***	-31.98 **
A_Rating	-32.93 ***	-38.35 ***	9.26			-45.40 ***		-89.21 **	-36.33 ***
BBB_Rating	-30.90 ***	-32.67 ***	16.22 ***			-39.82 ***		-61.13 **	-30.36 ***
Deal Type Dummies (Control Variables):									
Merger and Acquisition	1.96	-0.33	3.17	-3.09	0.16	4.16	-2.22	-19.96	2.71
LBO / MBO	5.32	10.22 **	-4.28	10.55 *	10.36	8.69	11.23	34.98 *	5.15
Ln(Nasdaq Composite Index)	-24.28 ***	-31.32 **	-8.80	-46.18 **	-77.38 ***	-32.27 **	-6.36	-32.32	-27.68 **
Industry Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2368	2368	556	1812	1073	1629	739	302	1908
Wald Chi-squared		523.23 ***	156.18 ***	318.52 ***	251.29 ***	439.62 ***	356.24 ***	253.75 ***	7621.7 ***
F-Statistics	19.91 ***								
R-squared	16%								

Table 8: Regression Analysis on the Structure of Loan Syndicate (Panel A)

The dependent variable is the "Number of Lenders in Syndicate" in Regressions (1) - (4), "Fraction of Deal Retained by Lead Arranger" in Regressions (5) - (8) and "Number of Lenders in Syndicate" times "Fraction of Deal Retained by Lead Arranger" in Regressions (9) - (16). All the variables are defined in Table 1. The method of estimation is the two-step Heckman selection model estimation, except Regressions (1), (5) and (9) that are estimated by OLS (for comparison purposes). The first-step regression of the Heckman's selection models is based on the regression specifications as shown in Table 5 (and thus depends on the specific sub-sample considered). A constant term is included in all the regressions, whose coefficient is not reported. Heckman's two-step standard errors are used. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Variables	Dep. Var.: Number of Lenders in Syndicate				Dep. Var.: Fraction of Deal Retained by Lead Arranger			
	(1) -- OLS	(2)	(3)	(4)	(5) -- OLS	(6)	(7)	(8)
Lead Arranger Characteristics:								
Top Tier Bank (dummy)	2.57 ***		0.04		-5.64 ***		-1.10	
LAMBDA (Inverse Mills' Ratio)		-20.91 ***	-20.91 ***	-7.69 ***		24.12 ***	24.16 ***	11.47 **
% Deal Retained by Lead Arranger				-0.19 ***				
Number of Lenders in Syndicate								-1.03 ***
Borrower Characteristics:								
Borrower is Parent Company	-1.34 *	0.53	0.53	-4.23 ***	1.89	-1.13	-1.12	-5.26 *
Loan Amount (US$ million)	0.01 ***	0.002 ***	0.002 ***	0.004 ***	-0.003 ***	0.0002	0.0002	0.004 ***
Borrower's Rating (Control Variables):								
Borrower has no Rating	-3.13 ***	-2.88 **	-2.88 **	-4.33 ***	-2.88	0.59	0.66	-3.97 *
AAA_Rating	-2.71	-7.30	-7.30	-10.19	25.46	45.39 ***	45.40 ***	26.00 *
AA_Rating	-4.80 *	-10.60 **	-10.60 **	-7.86 ***	-1.96	14.05 *	14.06 *	3.22
A_Rating	0.15	-4.93 **	-4.93 ***	-5.20 ***	-11.07 ***	5.75	5.77	-0.71
BBB_Rating	1.88 ***	-1.92	-1.92	-3.85 **	-13.04 ***	2.31	2.34	-2.09
Deal Type Dummies (Control Variables):								
Merger and Acquisition	0.93 *	2.09 *	2.09 *	2.36 **	-2.72	-9.67 ***	-9.70 ***	-5.44
LBO / MBO	-1.26 *	-4.11 **	-4.11 **	1.21	-3.71	-8.31 **	-8.33 **	-1.59
Nasdaq Composite Index	0.66	-3.14	-3.14	-2.40	-11.54	1.09	1.14	1.28
Industry Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	2368	2368	2368	1659	1659	1659	1659	1659
Wald Chi-squared		256.27 ***	256.27 ***	566.50 ***		199.87 ***	200.14 ***	382.66 ***
F-Statistics	14.28 ***				6.59 ***			
R-squared	26%				15%			

Table 8: Regression Analysis on the Structure of Loan Syndicate (Panel B)

Variables	Dep. Var.: Fraction Held by Largest Lead Arranger * Nbr. Lenders							
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Full Sample (OLS Regression)	Full Sample	Full Sample	Sub-sample Investment Grade = 1	Sub-sample Investment Grade = 0	Sub-sample of Deals w/ Low_Rating	Sub-sample of Deals w/ Rating	Sub-sample of Deals w/ no Rating
Lead Arranger Characteristics:								
Top Tier Bank (dummy)	13.91							
LAMBDA (Inverse Mills' Ratio)		-120.93	-109.36 *	-393.03 **	13.65	-106.36	-314.21 **	30.31
Borrower Characteristics:								
Borrower is Parent Company	-9.61	-75.81	-3.15	-189.24 **	94.22	67.39	-115.77 *	83.57
Loan Amount (US$ million)	0.02 *	0.01	-0.01	-0.010	0.08 ***	0.03	-0.01	0.08 ***
Size of Largest Block			0.95					
Borrower's Rating (Control Variables):								
Borrower has no Rating	-48.99 ***	-75.56 **	-61.17		-38.57			
AAA_Rating	-103.09 ***	-231.89	- -	- -			-340.92	
AA_Rating	-86.14 ***	-173.48 *	-82.05	148.24			-277.83 **	
A_Rating	-17.00	-112.63 *	-151.19 **	163.97			-244.84 ***	
BBB_Rating	-67.84 ***	-164.82 ***	-168.35 ***	126.04			-272.91 ***	
Deal Type Dummies (Control Variables):								
Merger and Acquisition	-10.22	-0.92	-29.01	86.31	-36.77	25.88	86.70	-113.52 ***
LBO / MBO	29.56	22.61	2.96	- -	20.99	39.97	31.80	-118.10 *
Nasdaq Composite Index	-78.75	-225.71 *	-137.64	128.61	-347.53 **	-400.38 *	-112.94	-294.06 *
Industry Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	1659	1659	1339	424	1235	681	1105	554
Wald Chi-squared		176.81 ***	148.13 ***	89.99 ***	181.23 ***	130.91 ***	152.78 ***	126.57 ***
F-Statistics	5.33 ***							
R-squared	4.47%							

Table 9: Loan Spreads for Different Quartiles of Lead Arranger Retention

The dependent variable in all the regressions is "Spread" indicated in the loan agreement, defined as the rate (in basis points) above the LIBOR rate. All the variables are defined in Table 1. The method of estimation is the two-step Heckman selection model estimation, except the first two regressions that are estimated by OLS (for comparison purposes). In regressions (1), (3), (5) and (7), we estimate the model for the sub-sample of deals with "Fraction of Deal Retained by Lead Arranger" smaller than the 25% percentile (equal to 8.59). The regressions (2), (4), (6) and (8) consider the sub-sample of "Fraction of Deal Loan Retained by Lead Arranger" larger than the 75% percentile (equal to 28.33). In regressions (5) and (6), we further limit the sub-sample of deals with investment grade ("Investment Grade" = 1), while the regressions (7) and (8) the sub-sample of deals without investment grade ("Investment Grade" = 0). The first-step regression of the Heckman's selection models is based on the regression specifications as shown in Table 5 (and thus depends on the specific sub-sample considered). A constant term is included in all the regressions, whose coefficient is not reported. Heckman's two-step standard errors are used. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full Sample (OLS Regression)	Full Sample (OLS Regression)	Full Sample	Full Sample	Sub-sample Investment Grade = 1	Sub-sample Investment Grade = 1	Sub-sample Investment Grade = 0	Sub-sample Investment Grade = 0
	Lower Percentile	Higher Percentile	Lower Percentile	Higher Percentile	Lower Percentile	Higher Percentile	Lower Percentile	Higher Percentile
Lead Arranger Characteristics:								
Top Tier Bank (dummy)	-39.61 ***	-14.25 ***						
LAMBDA (Inverse Mills' Ratio)			64.15	158.26 ***	-63.22	-39.65	109.24	174.54 ***
Borrower Characteristics:								
Borrower is Parent Company	19.32 *	-5.57	15.01	-41.98 **	-10.69	53.28 ***	-50.22	-45.96 **
Loan Amount (million US$)	-0.01 ***	-0.03 ***	-0.001	0.02 **	-0.004	0.00	-0.02	0.02
Borrower's Rating (Control Variables):								
Borrower has no Rating	-52.16 ***	-37.93 ***	-48.78 ***	-42.76 ***	- -	- -	-29.55	-48.38 ***
AAA_Rating	- -	-229.96 ***	- -	-226.51 ***	- -	- -	- -	- -
AA_Rating	-140.21 ***	-164.86 ***	-121.90 ***	-144.73 ***	-41.47	239.91 ***	- -	- -
A_Rating	-128.34 ***	-123.95 ***	-101.23 ***	-125.11 ***	-2.10	222.04 ***	- -	- -
BBB_Rating	-112.27 ***	-107.49 ***	-86.56 ***	-98.82 ***	- -	218.80 ***	- -	- -
Deal Type Dummies (Control Variables):								
Merger and Acquisition	-9.17	-29.13 ***	-38.14	-39.72 **	19.14	-33.56 **	-54.14	-33.56 **
LBO / MBO	57.00 ***	31.67 ***	25.52	39.72 **	- -	48.02	-41.92	44.79 **
Ln(Nasdaq Composite Index)	36.78	23.28	68.96	90.97 *	43.03	-6.35	-19.74	89.66
Industry Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies Included?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	288	1692	267	1534	131	236	136	1298
Wald Chi-squared			172.82 ***	311.44 ***	32.59	243.63 ***	10001 ***	176.27 ***
F-Statistics	18.69 ***	64.31 ***						
R-squared	57%	35%						