The Costs of Being Private: Evidence from the Loan Market

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We thank Viral Acharya, Ashwini Agrarwal, Linda Allen, Yakov Amihud, Sreedhar Bharath, Francesca Cornelli, Anurag Gupta, Jens Hagendorff, Victoria Ivashina, Alexander Ljungqvist, Julian Mattes, Ernst Maug, Holger Mueller, Lars Norden, Steven Ongena, Joerg Rocholl, Joao Santos, Philipp Schnabl, Phil Strahan, Greg Udell, Neng Wang, Rebecca Zarutskie and the participants of the 2010 WFA Meeting, 2010 AEA Meeting, the 45th Bank Structure and Competition Conference, the EFA 2009 Bergen Meeting, the 2009 FIRS Meeting, the 2009 CEPR Meetings in Gerzensee, and the 2009 DGF Meeting for helpful comments and discussions. We also thank Thomas Bloch (JP Morgan), Hergen Frerichs (KBC), Geert Henckens (KBC), and Markus Holzhaeuser (Deutsche Bank) for useful discussions. Sascha Steffen acknowledges support from Deutsche Forschungsgemeinschaft (Grant Ste 1836/1-1).

Abstract

Using a new data set of U.K. syndicated loans, we document a significant loan cost disadvantage incurred by privately-held firms. We find that private firms typically pay 27 bps higher loan spreads when compared to public firms, controlling for a wide array of borrower and loan characteristics. We address endogeneity issues using Propensity Score Matching, Instrumental Variables and Treatment Effects Models. For identification, we use the distance of a firm's headquarters to London's capital markets as a plausibly exogenous variation in corporate structure choice. We analyze the channels of the loan cost disadvantage of being private by documenting the importance of: 1) the higher costs of information production, 2) the lower bargaining power, 3) the differences in ownership structure, and 4) the differences in secondary market trading. Interestingly, we find no evidence that lenders price expected future performance into the loan spread differential.

JEL-Classification: G21, G22 Keywords: Banks, Syndicated loans, Costs of being private

1. Introduction

Do privately-held firms face higher borrowing costs in loan markets than publicly traded firms? Answers to this question have been very limited thus far. This is surprising given that a significant proportion of loans in the syndicated loan market have been allocated to private borrowers and given the central role that private firms play in the economy.[1] Two important exceptions are Pagano et al. (1998) and Schenone (2010). Pagano et al. (1998) investigate the going public decision for a sample of Italian firms and find that a firm's borrowing costs decline after they go public. Studying a panel of U.S. firms that go public during her sample period, Schenone (2010) finds evidence consistent with firms increasing their borrowing cost bargaining power after their IPO.

This paper expands these prior studies along a number of dimensions. First, we have access to a new dataset of UK syndicated loans, a country with well developed stock markets comparable to the U.S.[2] We exploit UK specific institutional characteristics and the heterogeneity among our sample firms to investigate the loan cost difference between public and private firms. Such an investigation is feasible since, unlike the U.S., UK company laws require public and private firms to disclose their financial statements with the UK national corporate registry. Since the enactment of the Companies Act in 1964, all limited liability (private and public) companies are required to be registered with the UK Companies House's corporate registry and to disclose their financial statement information on an annual basis. We study public firm versus private firm borrowing costs by comparing both the cross-sectional variation as well as the time-series differences in spreads for firms that remain private, go public, or stay public.[3]

Additionally, we carefully address endogeneity concerns regarding the choice of going public or staying private. Public and private firms might differ in unobserved ways and these

unobserved differences might explain the loan spread differences between both types of firms. Prior research addressed this by estimating within-firm changes of loan spreads around a firm's IPO. This test, however, also suffers from a selection bias due to the endgogeneity of the IPO decision. In particular, we exploit a number of econometric techniques, such as propensity scores, instrumental variables, and selection models to demonstrate that our results are not driven by an unobserved opacity of private firms.

Moreover, we analyze various channels through which higher loan spreads of being private can be explained. Specifically, those channels include: 1) the higher costs of information production, 2) lower bargaining power, 3) differences in ownership structure, 4) differences in secondary market trading, and 5) differences in future performance. To the best of our knowledge, this is the first paper that addresses alternative channels that drive loan cost differences between private and public firms.

In our first set of tests, we demonstrate that private firms pay, on average, 27 bps higher loan spreads as compared to publicly traded firms, after controlling for borrower and loan characteristics. This loan cost difference is substantial and translates into $ 0.64 million in additional costs for private firms annually. The empirical design of our paper also seeks to address self-selection concerns regarding the endogeneity of the corporate structure decision (i.e., being public rather than private). Initially, we use propensity score matching of private to public firms in order to quantify the loan cost effect of being a private firm. The difference in spreads between these matched firm loans is an estimate of the additional borrowing cost of remaining private. The difference in spreads ranges from 26 bps-60 bps based on the matching method used.

Propensity score estimators, however, are inconsistent estimators of the loan cost disadvantage of being private if there are "unobservables", such as firm opacity, that affect both the assignment of a firm as public or private, as well as loan spreads. The key identification challenge in this paper is to separate the extent that loan spreads are driven by economic differences between private and public firms, such as lower costs of information production, and not by firm opacity. Accordingly, we employ Instrumental Variable Tests and Treatment Effect models to isolate the effects of firm opacity on loan spreads. We propose the distance of the firm from London's capital markets as a plausible exogenous instrument to explain the likelihood of being public unrelated to loan spreads. Our results suggest that unobserved opacity does not explain the observed loan cost differences between public and private firms.

We then ask what are the channels through which privately-held firms pay higher loan spreads compared to public firms. We argue that the higher cost of information production associated with private firms is an important determinant of the higher loan costs for these firms. For example, analyzing our propensity score matched sample, we find that private firms pay similar loan spreads as public firms if they have a greater inclination of becoming public (i.e., if they become increasingly similar to public companies). In further tests, we employ two proxies to measure the higher cost of information production. First, we test the hypothesis that private firms that have issued public bonds prior to loan origination are more transparent when compared to other private firms (i.e., the cost of information production is lower). For such firms, the loan cost disadvantage of being private should be less pronounced.[4] We find that private firms with public bonds do not pay significantly higher spreads when compared to public firms. As a next step, we investigate the informational effect of being listed on equity markets with different degrees of listing and disclosure requirements. We find that public firms that are

listed on opaque segments of the stock market (Small Cap/AIM) do not pay significantly lower spreads compared to private firms (i.e., being public in and of itself does not eliminate a loan cost disadvantage if the IPO results in a listing on a relatively small secondary market such as AIM).

A second channel through which public firms can benefit relative to private firms is through greater bargaining power vis-a-vis their lenders. For example, Sharpe (1990) and Rajan (1992) argue that lending relationships might be costly for firms if they become informationally "locked-in" by their relationship lender. We find evidence consistent with this hypothesis. In particular, relationships affect private firms' loan spreads differently compared to public firms. While the former experience an increase in loan spreads borrowing from a relationship lender, public firms benefit from paying lower spreads. This result suggests that an IPO shifts bargaining power from lenders to borrowers.

A third channel that potentially explains the higher relative borrowing costs of private firms is the differences in their ownership structure as compared to public firms. We focus on: 1) inside ownership concentration and 2) private equity ownership in this paper. For example, private firms usually have a higher concentration of insider ownership leading to agency related incentives. Following arguments in Amihud and Lev (1981) and Wright, Ferris, Sarin, and Awasthi (1996), there may be enhanced risk taking incentives if managerial and shareholder interests become increasingly aligned suggesting higher loan spreads would be established for private firms. We document significantly higher loan spreads for firms with more concentrated ownership. For instance, increasing the number of shareholders from the highest to the lowest ownership concentration quartile reduces loan spreads by 25 bps. Another determinant could be the influence of private equity ownership on firm behavior and loan spreads. Corporate loans are

a major source of debt financing in buyout deals in the UK such that the high leverage used in these deals might well explain higher loan spreads for private firms. We identify the loan deals with private equity firm participation (public-to-private transaction, LBO/MBO, acquisition, and recapitalization) and document significantly higher loan costs associated with these deals. More importantly, we find that loan spread differences are reduced (and even disappear) if deals by public firms involve private equity.

A fourth channel of the loan cost disadvantage of private firms relates to secondary market loan sales. The secondary loan market in the UK is small compared to that of the U.S., but loan trading has substantially increased since 2003. In particular, the number of private firm loans that have been sold after origination increased heavily following the private equity boom of the post 2005 period. However, the effect of secondary market trading on loan spreads is ambiguous. While diversification or information advantages of lenders of traded vis-a-vis not-traded loans should lower spreads, monitoring of lenders might be effectively reduced thereby increasing the scope for risk shifting and leading to higher spreads. We find 45 bps higher loan spreads for traded relative to not-traded private firm loans consistent with the monitoring effect. However, this effect does not extend to public firms. For such firms, we do not find a statistically significant loan cost difference between traded and not-traded loans.

Next, we analyze the effect of future performance as a fifth potential channel which may explain higher loan spreads for private firms. A testable hypothesis is that loans to private firms have higher loan spreads as public firms are less risky than private firms or they differ in terms of their future investment opportunities. Lenders might anticipate these performance differences and ex-ante demand higher spreads for private firm loans. To summarize our results, by

employing measures such as differences in future sales growth, Z-Score, or credit ratings, we cannot find a statistically significant effect on loan spreads.

Overall, the results and findings of our paper are closest to those of two important papers by Pagano et al. (1998) and Schenone (2010) discussed earlier. They are also related to the existing literature regarding why firms go private. This literature has largely ignored the borrowing costs of being private. For example, DeAngelo et al. (1984b, 1984a) find significant gains for shareholders in public firms that go private. Lehn and Poulsen (1989) argue that these gains can be attributed to the mitigation of agency conflicts associated with the availability of free cash flow. Kaplan (1989a, 1989b, 1991) analyzes LBO transactions and find that incentive improvements and tax effects associated with high leverage are driving the benefits of going private. Interestingly, none of these papers addresses the higher cost of debt associated with being a private company. There is also voluminous literature on why firms go public. This literature often avoids analyzing debt cost motivation issues largely due to data availability.[5]

The structure of the remainder of the paper is as follows. Section 2 describes the institutional setting, presents our dataset, and provides descriptive statistics. In Section 3, we discuss our univariate tests and OLS regression results regarding the loan spread difference between private and public firms. We report the results from Propensity Matching as well as those from a variety of further endogeneity tests (Instrumental Variables and Treatment Effects Models) in Section 4. Section 5 examines the possible channels to explain why private firms have higher borrowing costs than public firms. Section 6 provides our conclusions.

2. Institutional Setting and Data

2.1. Institutional Setting

Since only a limited number of papers are concerned with the UK market in general and differences between private and public companies in particular, we provide further information regarding UK company law in this section.[6]

In the UK, all public and private limited liability companies are formed by registering with the UK Companies House.[7] Public companies must add either "public limited company" or "plc" to their name and must have a minimum share capital of GBP 50,000. Alternatively, private limited companies need only include "limited" and they are not required to have minimum share capital. The most important difference between a private and a public company is the ability of public firms to issue public equity. In this paper, a public company is a firm that is listed on the London Stock Exchange (Section 81 of Companies Act 1985).

The Companies Act of 1967 requires all public and private limited liability companies to file their financial statements annually with the national corporate registry. However, prior to this act, this was only a requirement for public firms. Certain small or medium-sized companies may prepare accounts for their members under the special provisions of Sections 246 and 246A of the Companies Act 1985.[8] In addition, they may prepare and deliver abbreviated accounts to the Registrar. Public companies (as well as certain companies in the regulated sectors) cannot qualify as small or medium-sized companies.[9] Similarly, companies that are part of a group whose members include public companies or certain companies in the regulated sector cannot qualify as small or medium-sized. For the other companies, to be classified as small (medium), they must fulfill two of the following criteria for two consecutive years: 1) annual turnover must be GBP 5.6 million (GBP 22.8 million) or less and the balance sheet total must be GBP 2.8

million (GBP 11.4 million) or less and 2) the average number of employees must be 50 (250) or fewer.[10]

Sections 221-242 of Companies Act of 1985 provide guidelines as to how financial statements of private and public companies must be submitted. For example, public companies must file within ten months of their fiscal year, while private firms must file within seven months. For both types of firms, these statements must be prepared in accordance with UK accounting standards. If a companies' annual sales exceed GBP 1 million (and all of our sample firms easily passed this threshold), the financial statements have to be audited.[11]

Similarly, UK tax laws do not differentiate between public and private firms as to how financial statements must be prepared. Even though there are additional disclosure requirements for public companies by the London Stock Exchange, these listing rules do not mandate accounting standards for financial reporting. Overall, financial reporting, as required by the UK regulatory regimes, are comparable for private and public firms. This should bias us against finding a loan cost difference between public and private firms.

The London Stock Exchange (LSE) offers two markets for listings: 1) the Main Market and 2) the Alternative Investment Market (AIM). The AIM was launched in 1995 for smaller growing companies. The LSE sets no minimum trading record and does not require a minimum capitalization, asset size, age, or free float for admission to AIM. Further, companies admitted to AIM are exempt from seeking shareholder approval prior to substantial share transactions (except reverse takeovers or disposals resulting in a fundamental change of business). Companies do, however, need a nominated broker who organizes the flotation and a nominated advisor (Nomad) who supervises the flotation and advises the companies after listing. There is

no further regulatory oversight by the Financial Services Authority (FSA), which oversees the Main Market.

Information about admissions to the AIM (new admissions, transfers from the main list, and re-admissions) and delistings (going privates and transfers to the main list) for the 2001-2009 period reveal some interesting patterns. The number of admissions to the AIM increased from 177 in 2001 to 462 in 2006. However, after the 2008-2009 period, admissions decreased to 114 in 2008 and 36 in 2009, respectively. The number of delistings also increased from 72 in 2001 to 227 in 2006 and even increased to 258 (293) in 2008 (2009). More interestingly, the percentage of transfers from or to the main stock exchange decreased (i.e., from 10% of delistings in 2001 to 3% in 2009). These findings suggest that firms that are listed on the AIM may be very different from firms that go public on the main market.

2.2. Data and Sample Selection

To gain insight regarding the loan spread benefits of being a public rather than a private company, we construct a unique dataset using three data sources: 1) the Loan Pricing Corporation Dealscan (LPC) database, 2) Bureau van Djik's (BvD) Amadeus (Amadeus) database, and 3) the Securities Data Corporation (SDC) new securities issue database.

We create the universe of our sample by merging loan transaction data from LPC with borrowing firm financial statement data from Amadeus. LPC contains detailed information regarding worldwide syndicated loan originations (e.g., contract terms, lender identities and roles within the syndicate), as well as borrower identity (i.e., name, region, country, and SIC industry classification).[12] However, Dealscan only provides sales data for U.S. companies and, in general, provides no further financial statement data. To supplement our dataset with a rich set of

financial variables for both private and public sample borrowers, we focus on UK firms and match our loan data with UK data from Amadeus.

The Amadeus database contains accounting statements for almost all private and public companies (more than 2 million companies in total) that are registered with UK the Companies House.[13] Jordans, a UK based information provider, collects data from the Companies House and BvD, in turn, collects data from Jordans (Brav, 2005). There is no common identifier in LPC and Amadeus to UK firms. Therefore, we manually match both databases using the borrower's name and industry classification.

The large number of name changes (particularly among private companies) poses special challenges. Unfortunately, there is no unique identifier that tracks companies through name changes and mergers. To deal with this scenario, we look at each company individually. We then construct a chronology of name changes using different sources, namely, the "WebCheck-Service" on the web site of the UK Companies House, Bloomberg's corporate action calendar, and Hoover's corporate histories database.[14]

Amadeus provides two types of variables, "static" and "annual." All financial variables are annual variables. Static means that only the last year's reported value is recorded in the database. The company type (privately-held or public) is a static variable. Since the separation between public and private companies is crucial for our analysis, we manually checked each company name for its IPO date and delistings during our sample period using SDC, Bloomberg's corporate action calendar, and Hoover's corporate histories database. We supplemented information for private companies using financial statements directly obtained from the UK Companies House. We always use accounting information from the fiscal year ending in calendar year t-1 for loans made in calendar year t.

Table 1 provides descriptive statistics for our data. Panel A reports the calendar time distribution of loans for public versus privately-held firms. Similar to the distribution of loans in the U.S., the number of observations is larger in later years as the coverage of LPC improved over time. In the 1990s, private firms were relatively less active borrowers in the syndicated loan market. This changed in the 2000s and private borrowers are now (at least in terms of number of loans) more active than public firms. Panel B of Table 1 presents the calendar time distribution of loan amounts with the average loan amount in each year being significantly higher for public sample borrowers. Panel C of Table 1 displays the industry classification of borrowers using the one-digit SIC Code. There is a strong concentration of loans in the manufacturing industry (SIC Codes 2 and 3) and the service sector (SIC Code 7). Panel D illustrates loan contracts according to their primary purpose as recorded in LPC with acquisition related purposes being the most frequently reported purpose.

Insert Table 1 about here.

Table 2 presents various sample summary statistics. The variables are winsorized at the 1% and 99% level. The number of observations corresponds to observations where all loan and borrower data are simultaneously available. The median AISD in our sample is 175 bps and the median loan size is $130 million with a maturity of 60 months. The median borrower size is $684 million and the median borrower is 16 years old.

Insert Table 2 about here.

3. The Costs of Being Private

3.1. Univariate Tests

To analyze whether public firms receive better loan terms than private firms, we first examine whether certain key loan features are significantly different for loans to private versus public firms. In Panel A of Table 3, we segregate the entire sample based on the legal corporate status of the borrower to test if loan terms reflect whether a borrower is a public or privately-held company. Columns A and B report mean values for key loan terms for private and public companies, respectively. These loan terms include the All-In-Spread-Drawn (AISD) and several non-price loan terms including: 1) loan amount (in million U.S. dollars), 2) maturity of the loan (in months), 3) collateral (the percentage of secured loans), 4) term loan, and 5) refinancing. Standard deviations are given in parentheses. The last column reports the parametric t-statistic (nonparametric z-statistic) of the difference in means (medians) test. The results of the univariate difference in means tests provide strong evidence that public firms receive better loan terms. When comparing the average AISD for public versus private firms, we find that, on average, the AISD is 153 bps lower for public firms versus private firms. This difference is significant at the 1% level. Loan amounts to public firms are typically $400 million larger and loans to public borrowers are less likely to be secured. Each of these results is significant at the 1% level and the magnitude of the differences is economically meaningful.

Insert Table 3 about here.

While the univariate tests provide preliminary evidence that borrowers derive significant loan cost benefits from being public, these results do not take into account potentially significant

differences between public and privately-held firms. Indeed, Panel B of Table 3 indicates there are differences in key borrower characteristics between both groups. The average size (defined as the book value of total assets) of public borrowers ($8,984 million) is five times the average size of private firms ($1,616 million). Public firms have a higher tangible to total assets ratio (38% vs. 34%), more cash ($412 million vs. $67 million) and are older (34 years vs. 23 years). These differences are statistically significant at the 1% level.[15]

The mean long-term debt to assets ratio and the mean interest coverage ratio are higher for private firms. The differences in medians are not statistically significant with regard to leverage and only weakly significant with regard to interest coverage. On average, private and public firms are equally profitable, with the difference in EBITDA to sales ratios insignificantly different from zero.[16]

The results of the univariate tests suggest that borrowers have a significant pricing benefit from being public. However, the tests of the differences in borrower characteristics suggest that there are systematic distinctions between public and private borrowers that may very well offer explanations of this pricing difference over and above corporate organizational form.

3.2. Multivariate Tests

To analyze initially whether public companies pay lower risk-adjusted loan spreads after controlling for borrower and loan characteristics, we use a regression model of the following form:

$$AISD = \beta_0 + \beta_1(Public) + \sum\beta_i(Borrower_i) + \sum\beta_j(Loan_j) + \sum\beta_k(Controls) \quad (3.1)$$

The results of this regression are reported in Table 4. The model shows coefficient estimates for the loan cost advantage of public firms using a pooled OLS regression. Standard errors used to assess significance are corrected for heteroscedasticity and firm level clustering (Rogers, 1993).[17] Column 1 of Table 4 reports the impact of being public on loan spreads including only borrower characteristics. Column 2 only includes loan characteristics, while Column 3 presents the full model using both borrower and loan characteristics as control variables. The results suggest that there are significant additional spread costs incurred by private companies borrowing in the loan market. In particular, the coefficient of Public is negative and significant at the 1% level and indicates that public firms pay 27 bps less for loans than private companies after controlling for borrower and loan characteristics. Given our univariate results that report a 160 bps loan spread difference between private and public borrowers, these results suggest that 16% of the difference can be explained by corporate form alone. The economic magnitude of this loan cost disadvantage is material. Given the average facility size of private firm loans of 237 million USD, 27 bps translates into an annual cost saving of 0.64 million USD or 1.2% of private firms' profits, which is 52 million USD on average.

We also find that more profitable firms, firms with more tangible assets, and investment grade rated firms pay lower spreads. Unrated firms also pay lower spreads relative to non-investment grade rated firms. Smaller loans as well as loans with covenants and loans with longer maturities are associated with higher spreads. Loans that are originated for acquisition purposes (not reported in Table 4) exhibit significantly larger spreads.[18]

Insert Table 4 about here.

In sum, the basic OLS regression results suggest that public firms pay, ceteris paribus, lower loan spreads than private firms. In the following section, we use a sample of private and public borrowers employing propensity score matching to more completely control for any selection bias present in the OLS regression tests.

4. Endogeneity Tests -The Choice of Being Public

4.1. Propensity Score Matching

An obvious limitation of this approach is that the corporate structure choice may be endogenous. Firms determine whether they want to be public or private. Initially, we use Propensity Score Matching to reduce a potential selection bias in estimating the causal effects of being public on loan spreads. First, we estimate a probit model including variables determining the outcome (i.e., loan spreads), as well as variables determining participation (i.e., the decision to be public). Brav (2005) and Michaely and Roberts (2007) address firms' self-selection as to legal form using a probit model in their first stage regressions. They also look at UK companies and we use the same variables used by these authors as determinants of participation. We then use the results from the probit regression to calculate a borrower's propensity score (i.e., the probability that a firm is public given our set of control variables). In order to obtain robust results from our analysis, we use two different matching methodologies to evaluate the cost of being private: 1) the nearest neighbor and 2) local linear matching which we discuss below. We keep the discussion about propensity score estimation very compact in the body of this paper and provide an extensive discussion about the methodological aspects of propensity score matching, as well as tables, in an online appendix.

The first class of matching estimators we use is nearest neighbor matching. For each loan to a public firm, nearest neighbor matching chooses the loan to a private firm that is closest in terms of its propensity score (this loan is called the "neighbor"). We use 50 and 100 nearest neighbors to match loans to both types of firms.[19] The results present significant loan cost savings for public companies. Matching with 50 (100) nearest neighbors suggests that public firms save 26 bps (46 bps) when compared to private firms.

For robustness, we repeat our analysis using local linear matching as an alternative matching procedure. In particular, local linear matching has certain advantages over nearest neighbor matching when propensity scores are not distributed symmetrically. Local linear matching uses the weighted averages of all loans to private firms to construct the matched sample. Basically, these weights are a function of the distance between the propensity score of the loan to the public firm and the propensity score of each of the loans to the private firms, with loans to private firms with propensity scores similar to that of the public firms receiving the greatest weight. The larger the distance between the public and private firm scores, the lower the weight. Local linear matching demonstrates that public firms pay 60 bps lower spread than private firms. The difference is highly significant. This confirms our earlier results that loan spreads are higher for private than for public firms.

Figure 1 illustrates spreads for both public firms (solid line) and matched private firms (dotted line) as a function of the propensity score. We make the following observations. First, loan spreads for private and public firms decline as a function of the propensity score consistent with more transparent firms paying lower spreads. Additionally, the loan spread of the matched private firms is higher than the spread of public firms across all propensity scores. More importantly, the public-private firms difference in spreads declines as a function of the

propensity score. These results suggest that the cost of being private dissipates for private firms with a high propensity of being public. The intuition behind these results is that high propensity score private companies become increasingly similar to public companies and their cost of information production is reflected in almost identical loan spreads. We re-examine this issue later in the paper when we analyze the mechanisms that can explain the loan spread differences between public and private firm loans.[20]

Insert Figure 1 about here.

4.2. Instrumental Variables

Propensity score matching rests on the assumption that private and public firm loans can be matched based on observable borrower and loan characteristics alone. However, one might argue that private and public firms differ along unobservable dimensions such as firm opacity. To the extent that firm opacity may explain both the likelihood of being public and loan spreads, our coefficient estimates are potentially biased. Put differently, the higher borrowing costs of private firms might simply be an artifact of the higher opacity of private firms. The key identification challenge in this paper is to separate the extent to which higher borrowing costs of private firms are driven by the economic differences between private and public firms, such as, the higher information production costs for lenders, and not by the opacity of firms. Therefore, we need some exogenous variation in the corporate structure choice (i.e., private versus public) as an instrument that is uncorrelated with loan spreads. We propose to use log(1+distance) as an instrument. Distance is measured as the distance of the firm's home office from London and its capital markets. Proximity to a financial center should facilitate access to public capital markets,

but should not be related to individual loan spreads. Indeed, distance has been used for identification in a variety of settings (Petersen and Rajan, 2002; Bharath et al., 2007). Here, we are not interested in how firms establish relationships with their lenders, but rather how they match with investors and underwriters during their going public process in a similar spirit as described in Ben Dor (2004) and Faulkender and Petersen (2006). To address skewness, we use log(1+distance) during the estimation of the model. The average distance of a firm to London is 128 miles. Preliminary analyses indicate that firms that are headquartered in London have a 50% greater likelihood of being stock exchange listed when compared to firms that are headquartered elsewhere.

In this subsection, we use both an instrumental variable and a treatment effects approach. More specifically, we follow Maddala (1983) and Greene (2003) and use both an instrumental variable model and a treatment effects model to control for endogeneity, each of which relies on different assumptions. While the instrumental variable model assumes that the instrument explains the firm's decision to be public or private, but does not explain loan spreads, the treatment effects model assumes that errors in the selection and spread models follow a bivariate normal distribution, both of which are unverifiable assumptions. In other words, the treatment effects model can be identified without using instruments, but by depending upon non-linearities for identification. However, as Little (1985) argues, this can lead to unreliable estimates of the parameters.

Table 5 reports the results of an instrumental variables (IV) estimation and Treatment Effects Model. Columns (1) and (2) of Table 5 report the results from the IV estimation. Column 1 presents the results from the first stage regression. We argue that the physical proximity of firms to London increases the propensity to be public. Consistently, we find that the coefficient

of log(1+distance) is negative and significant at the 1% level (t-value=4.3). That is, firms that are headquartered further away from London are less likely to go public. Staiger and Stock (1997) propose a test for the strength of an instrument under the null hypothesis implying that the instrument is not significantly different from zero. The diagnostic section of Table 5 indicates that we can reject this hypothesis at any confidence level and our instrument clearly passes the threshold for this F-test (the F-statistic is 25.15). The coefficient of Public is -48.79 and significant at the 1% level. The OLS coefficient is 27 indicating the impact of being public on loan spreads is almost twice as high under the IV approach. In other words, after controlling for the possible endogeneity of the corporate structure using instrumental variables, we still find a significant difference in spreads between private and public firm loans. This effect is somewhat higher when compared to the OLS estimation.[21]

Insert Table 5 about here.

4.3. Treatment Effects Model

Table 5 also reports the results from the Treatment Effects Model. Again, we treat Public as a potentially endogenous variable, but now estimate a model where identification does not come from the assumption that our instrument does not affect loan spreads other than through the private/public distinction. We index each loan with *i* and each borrower with *j* and augment the outcome model (AISD) with a model about the corporate structure choice (Public*):

$$AISD_{ij} = \alpha Public_{ij} + \beta_1' x_{ij} + \epsilon_{ij}$$

$$Public_{ij}^{*} = \gamma' w_{ij} + \mu_{ij}$$

where $(\mu_{ij}, \epsilon_{ij})$ are assumed to be bivariate normal $[0, 0, 1, \sigma_\epsilon, \rho]$. In other words, our identification strategy depends upon the assumption that the error terms of the outcome and the corporate structure model are jointly bivariate normal. Under this assumption, the model can be consistently estimated using a two-step procedure (Maddala, 1983). $Public_{ij}^{*}$ is observed as $Public_{ij} = 1$ if $Public_{ij}^{*} > 0$ and zero otherwise with probabilities $Pr(Public_{ij} = 1) = \varphi(\gamma' w_{ij})$ and $Pr(Public_{ij} = 0) = 1-\varphi(\gamma' w_{ij})$. $Public_{ij} = 1$ indicates that the firm is public; φ is the cumulative normal distribution function. Columns 3 and 4 report the results from the Treatment Effects Model. Column 3 reports the coefficient estimates of a probit model of being public, while Column 4 presents the coefficient of the effect of being public on loan spreads. All variables correspond to the ones used in Model (4) in Table 4. Consistent with the IV tests, we find that the coefficient of log(1+distance) is negative and significant at the 1% level. That is, the greater the distance to London, the lower the likelihood that a firm is public. The coefficient of Public is -47.61, significant at the 1% level, and is of similar magnitude to the IV estimates. The diagnostic section reports the results testing the hypothesis that the error terms of the outcome and corporate structure model are uncorrelated. We cannot reject this hypothesis at conventional levels (the Inverse Mills Ratio (λ) is -8.918 with a p-value of 0.374).

4.4. Exclusion Restriction

The exclusion restriction is violated if the distance of the firm's headquarters to London has a direct effect on loan spreads. Suppose that access to bank credit is also better in London than elsewhere. In that case, loan spreads might be lower in London due to banking competition which would violate the exclusion restriction. While a possible violation of the exclusion restriction is an important concern, this concern is minimized here for the following six reasons discussed below.

First, we note that private and public firms have access to the same lead arranger banks in our sample. The top five lead arrangers over our sample period include the Royal Bank of Scotland (RBS), Barclays, and Lloyds, both in private and public firm deals. Furthermore, with BNP Paribas among the top five arrangers, even private firms have access to foreign lenders.

We conducted a series of interviews with important lenders in the U.K. (and European) loan market to obtain information about competition in this market. The business model of banks differs substantially for retail, SMEs, or large corporate clients. Focusing only on corporate customers, all large U.K. banks segment their organizations using turnover bands. Using Barclays as an example, very large clients (usually with turnover above GBP 1 billion) are covered by Barclays Capital (the investment banking unit of Barclays group). However, firms with a turnover above GBP 250 million are generally considered large corporate clients. The firms in our sample have, on average, a turnover of GBP 2.8 billion. Even among the subsample of privately-held firms, we document a median turnover of GBP 250 million. Only 5% have a turnover below GBP 23 million and 25% report a turnover above GBP 620 million. In other words, the average firm in our sample belongs to the group of large corporate clients. The average deal size in our sample is GBP 970 million, GBP 570 million for private firms. These

large deals are usually structured and originate in London or wherever the bank is headquartered (e.g., Edinburgh in case of RBS). Nonetheless, UK banks maintain a large branch network throughout the UK for corporate clients. That is, even though the origination is completed in London, large banks have a strong presence across the UK which facilitates access to, and relationships with, these banks independent of the location of the firm. This anecdotal evidence suggests that the location of the firm is of minor importance in determining lending spreads in the UK.

If the location of the firm's headquarters is not important with respect to access to corporate loans, the distance between the firms and individual branches of their banks should also be insignificant. We are able to construct a measure for the distance of a firm's headquarters to the closest branch of two of our sample banks, the Royal Bank of Scotland (RBS) and Barclays.[22] The mean borrower-branch distance is 10.3 miles (with a standard deviation of 10.7 miles) and is significantly smaller for Barclays branches (1.8 miles) compared to RBS branches (13.1 miles). This distance is also small compared to the average distance between a firm and London (128 miles) and is consistent with what we inferred speaking with practitioners (i.e., U.K. banks have a well distributed branch network even for business with corporate clients). We calculate the correlation between the distance between the firm and London and the firm and the next branch of the lead arranger and find a correlation of -0.05 (with a p-value of 0.24) which is insignificant and consistent with the interpretation that access to bank credit for larger corporations is not better in London than elsewhere. In a next step, we use the natural logarithm of one plus the branch-firm distance [$\log(1 + \text{distance}_{\text{branch}})$] as an additional regressor in our regression. The results are reported in Appendix II. Controlling for the distance between the firm and the closest branch of the lead arranger, we find that public firms pay 40 bps lower spreads

and the coefficient is significant at the 1% level. Further, we find that the borrower-branch distance does not have a significant effect on loan spreads. To further test the effect of distance for private relative to publicly traded firms, we further include an interaction term of log(1 + $distance_{branch}$) with Public. However, we do not find an effect of distance on loan spreads for private or public firms.

To account for the variation in turnover among our sample firms and the fact that smaller firms might benefit more from being closer to a branch of the lead arranger, we introduce four dummy variables, Size1, Size2, Size3, and Size4, which are equal to one if the firm's turnover is in the 0%-25% quartile, the 25%-50% quartile, the 50%-75% quartile, or the 75%-100% quartile, respectively, and interact them with our firm-branch distance measure. We report the results in Column 3 of Appendix II. We find that distance is insignificant and independent of the size of the firm.

We further differentiate between deals with and without a financial sponsor. While we examine the impact of private equity participation on loan spreads later in this paper, we note that the location of the firm might be even less important for spreads once a private equity sponsor is involved. Private equity sponsors (which are usually headquartered in London) negotiate the loan terms with the arranging banks of the syndicate (Ivashina and Sun, 2010). In other words, the relationship between banks and private equity firms determine loan contract terms rather than the location of the borrower or its distance to London. We test this in Column 4 of Appendix II and add Private Equity, a dummy equal to one if the deal includes a private equity sponsor, and add the interaction term Private Equity x log(1 + $distance_{branch}$). The coefficient of log(1 + $distance_{branch}$) indicates the effect of distance on deals that are not private equity backed. While the coefficient of Private Equity is highly significant and positive, we

cannot find a sizable effect of firm-branch distance on spreads in deals with or without private equity participation.

Finally, we ask whether borrowing from either of the top lead arrangers (i.e., Barclays vs. RBS) affects loan spreads and whether this is different for private relative to public firms. We add Barclays, a dummy equal to one if Barclays is among the lead arrangers (RBS is omitted), but we cannot find a statistically significant loan spread difference (Column 5). However, we still find that private firms pay 38 bps higher loan spreads when compared to private firms.

In summary, the results of our tests are consistent with the view that corporate loan spreads are independent of their distance from London. This supports our approach to use the distance of the firm to London as an instrument.

5. Channels of the Loan Cost Disadvantage of Being Private

The previous section suggests that private firms pay substantially higher spreads when compared to public firms that cannot be explained by borrower opacity. To help understand the sources of this loan cost disadvantage of private firms, we analyze the channels through which public firms benefit relative to private firms.

Pagano et al. (1998) suggest three possible explanations. First, post-IPO firms are less risky.[23] Additionally, arms-length investors can obtain information about the borrower at lower costs. Moreover, the higher visibility of post-IPO firms increases their bargaining power in relation to investors. They provide evidence that Italian firms change their capital structure following an IPO, thereby reducing their leverage. This at least partially explains the lower spreads. However, they say "...[the] results suggest that there is more occurring around the IPO

than a simple change in the credit quality of newly listed firms. At this stage, however, it is not possible to distinguish between the two other explanations - information and bargaining."

In this section, we suggest and examine five channels through which loan spreads are affected and assess their impact on the loan cost disadvantage of private firms. There are: 1) cost of information production, 2) bargaining power, 3) ownership structure, 4) secondary market trading, and 5) future firm performance. Our empirical approach is to analyze the effect of each channel on loan spreads individually and collectively. To do this, we augment our baseline equation with separate control variables for each channel and add interaction terms with Public whenever appropriate.

5.1. Lower Cost of Information Production

5.1.1. Bond Market Access

We start by analyzing the effect of bond market access on loan spreads. A substantial amount of information regarding the creditworthiness of a firm is revealed when the firm issues bonds through filings to register the bonds, information disclosed by underwriters to place the firm's bonds, pricing of its bonds, bond analysts reports, and through credit ratings. This information is likely to have an impact on loan spreads as well as the information regarding the riskiness of firms that debt market investors are concerned about (Hale and Santos, 2009). Therefore, we use the cross-sectional variation of private and public firms that have or have not issued public debt in the past to analyze the informational effect of public debt on loan spreads and the loan cost disadvantage of private firms.

First, we ask whether issuing public bonds lowers the cost of private debt. Table 6 reports the regression results. All control variables shown in Table 4 are included. We construct three

different measures for bond market access: Bonds is a binary variable equal to one if the firm has issued public bonds in the past. Last Bond Public is a dummy variable equal to one if the firm's last bond issue before the loan origination has been public. Log(1+Prior Bonds) is the natural logarithm of one plus the number of prior public bonds the firm has issued prior to the loan origination date. Consistent with our prior results, we find that public firms pay 27 bps lower loan spreads when compared to private firms. However, initially (Columns 1-3), we do not find evidence that having issued public debt affects loan spreads. We add the interaction term of Public and our measures for bond market access in Columns 4-6. For example, in Column 4, the coefficient of Bonds indicates that having access to the public debt market reduces spreads on private firm loans by 46 bps, which is economically meaningful and statistically significant at the 1% level. However, the coefficient of Bonds x Public is positive and significant and of similar magnitude. A Wald test cannot reject the null hypothesis that both coefficients are identical (p-value is 0.901). A similar interpretation can be extended to the other proxies for bond market access in Columns 5 and 6. These results are consistent with access to public debt lowering the cost of information production for investors translating into lower spreads for private firms.

Insert Table 6 about here.

If bond market access lowers the cost of debt for private (and not for public firms), it is a natural question to ask whether the loan cost disadvantage of being private still persists if private firms have access to the public debt market. We test this hypothesis in Column 7 where public firms with bond market access are the omitted group. We find that public firms without bond markets do not pay significantly different loan spreads compared to public firms with public

bonds, but, more importantly, private firms that have issued public bonds prior to loan origination also pay similar loan spreads when compared to public firms with public bonds. In other words, they do not experience a loan cost disadvantage because sufficient information is revealed about these firms upon the issuance of public debt. Private firms without public bonds, however, pay 34 bps higher loan spreads when compared to public firms with public bonds. This result is significant at the 1% level.

5.1.2. Stock Exchange Listings

We investigate the informational effect of being listed on exchanges with different degrees of disclosure requirements as a second mechanism that may explain the loan cost disadvantage of being private. We have two groups of public firms. First, we have FTSE 100 and FTSE 250 companies that may be thought of as the most transparent firms.[24] The second group of public firms comprises all other segments (i.e., Small Cap, Other and AIM). In particular, we are interested in the spread difference between this group of less transparent public firms and private borrowers, after controlling for observable borrower and loan characteristics.

We report descriptive statistics for firms within the different trading segments on the Main Market (FTSE 100, FTSE 250, Small Cap, Other) and the Alternative Investment Market (AIM) in Panel A of Table 7. We also include the descriptive statistics for private firms with and without bond market access. As can be seen, the FTSE 100 and FTSE 250 firms from the Main Market are much larger in size, pay typically lower spreads, have a more widely dispersed ownership structure, and borrow at shorter maturities when compared to all other firms on the Main Market, on AIM, and also private firms. Interestingly, while private firms are, on average,

much larger in size than firms traded on the Small Cap and Other segments of the Main Market and the AIM, our univariate tests suggest they typically pay much larger spreads.[25]

Insert Table 7 about here.

Panel B of Table 7 reports the regression results where FTSE 100/FTSE 250 is a dummy variable equal to one if the firm's equity is traded as part of these indices. Column 1 reports the results. As can be seen, FTSE 100/FTSE 250 firms pay 32 bps lower spreads than other public borrowers. We also analyze the loan spread differences between the two public firm cohorts and our private sample firms in Column 2 where private firms are the omitted group. We find that FTSE 100/FTSE 250 firms pay, on average, 39 bps lower spreads than private borrowers. Interestingly, however, there is no significant spread difference between private firms and Small Cap/Other/AIM firms in a regression setting. In Column 3, we further distinguish between private firms with and without public bonds and find that Small Cap / AIM firms pay 30 bps higher spreads when compared to FTSE 100/FTSE 250 firms (which are omitted).[26]

Our findings have interesting implications. Should all private firms become public to reduce their borrowing costs? Our results suggest that being listed in and of itself does not lower the firm's borrowing costs. Specifically, an IPO that results in a listing in a relatively small secondary market, such as the AIM, does not reduce a firm's borrowing costs. This is in line with Asker et al. (2010) who provide related evidence that even if the IPO reduces a firm's borrowing costs, the increased agency costs of being public has adverse economic consequences such as a reduction in a firm's investment incentives that outweighs the advantage of a lower cost of capital.

5.2. Bargaining Power

Do public firms have more bargaining power with regard to their lenders as compared to private firms? Or, to say it differently, can the loan cost disadvantage of private firms be explained by lenders exploiting their informational advantage? Rajan (1992) and Sharpe (1990) argue that the private information banks gain through monitoring allows them to informationally capture these firms. There is some empirical evidence supporting the assumption that relationship lenders have private information about their clients that is not easily available to outside lenders. James (1987) and Lummer and McConnell (1989) demonstrate that bank loan announcements (particularly the renewal of loans) convey information to lenders that is consistent with banks having private information from repeat lending relationships. Houston and James (1996) provide evidence for firms with long-term debt outstanding consistent with the hold-up problem. Sufi (2007) finds that lead arranger private information is important in a syndicated loan setting. Santos and Winton (2008) identify significant hold-up costs for bank dependent borrowers.

We follow the earlier literature in defining whether or not a bank is a relationship lender. A bank is a relationship lender if it had a lead position among the syndicate members in a loan to the same borrower during the past five years prior to the current loan (Ljungqvist et al., 2006; Bharath et al., 2008; Schenone, 2010). Since syndicated loan deals typically involve one or more lead role banks, our measure of relationships is a binary variable that is assigned the value one if one of the lead banks in the current loan syndicate is a relationship lender [Rel(Dummy)]. We further use intensity measures to proxy for the strength of the relationship. Rel(Number)

[Rel(Amount)] is the ratio of the number of loans (amount of loans) extended by the lead arranger to the same borrower as a percentage of the total number of loans (total loan amount) this borrower received in the past five years prior to loan origination.

Table 8 reports the regression results. Public firms still typically pay 27 bps lower spreads even after including the three relationship measures as shown in Columns 1-3. The coefficients on the relationship variables are positive and significant at the 5%-10% level. In Columns 4-6, we interact these variables with Public to identify the effect of relationships for private to public firms. For example, Column 4 reports that private firms borrowing from a relationship lender pay, on average, 22 bps higher spreads relative to non-relationship borrowers. This result is consistent with Schenone (2010) who also identifies higher loan spreads for firms before they go public and suggests that lenders exploit their informational advantage by imposing higher spreads. Alternatively, the average public firm does not benefit from borrowing from a relationship lender. The sum of the coefficients of Rel(Dummy) and the interaction term is insignificant. This result is consistent with Bharath et al. (2008) who find that relationship benefits dissipate for transparent public firms.[27]

Insert Table 8 about here.

Next, we ask whether issuing public bonds in a prior period shifts bargaining power such that the relationship banks begin to share relationship benefits with their clients. To explore this, we introduce Private, a binary variable equal to one if the firm is private and assess the impact of being private conditional upon both borrowing from a relationship lender and having issued public debt prior to loan origination. Consistent with previous results, we find that the secular

effect of being private on loan spreads is positive and, on average, 24 bps and significant at the 1% level. Further, spreads are higher when private firms borrow from relationship lenders, but lower when they have access to public debt. More interestingly, however, is the coefficient on the triple interaction term (Rel(Dummy) x Private x Bonds) is negative and significant suggesting that even private firms can benefit from borrowing from relationship lenders, conditional upon having issued public bonds in the past. These results are consistent with Hale and Santos (2009) who find that bond IPOs mitigate information monopolies by relationship lenders. Even without relationships, private firms with bonds have lower loan spreads as compared to private firms without access to bond markets. Therefore, our results suggest that lending relationships is another important mechanism in explaining the loan cost disadvantage of private firms.

5.3. Ownership Structure

A third mechanism that can explain loan spread differences between public and private firms are differences in ownership structure between public and private firms. In this section, we examine two important aspects of ownership structure on bank debt costs: 1) inside ownership concentration and 2) private equity ownership.

5.3.1. Inside Ownership Concentration

The mechanisms as to how a firm's ownership structure influences its cost of capital is related to the corporate governance literature on: 1) ownership concentration and corporate risk taking and 2) ownership structure and takeover likelihood. For example, Amihud and Lev (1981) argue that there is a positive correlation between insider ownership and risk taking as the

interests of managers and shareholders become more aligned. Their results imply that loan spreads and ownership are negatively correlated. However, this relationship might be non-monotonic as suggested by Wright et al. (1996). That is, the relationship between insider ownership and risk taking might initially be positive. However, as time goes on, it may become negative because too much of the manager's personal wealth is tied up in the firm so that inside owners prefer less risk and managers become entrenched and (due to non-financial benefits and costs) pursue non-value maximizing strategies. A second strand of literature analyzes the link between ownership concentration and takeover likelihood. Song and Walkling (1993) argue that this relationship is negative. The higher the percentage of insider equity ownership, the less likely it will be that the company is a takeover target.

We collect data on firm ownership from Bureau van Djik's "Ownership" database that provides approximately 15 million active direct owner and subsidiary links.[28] The database provides a list of shareholders with their percentage of ownership and the ultimate owner of the firm (i.e., the shareholder with the highest percentage of ownership provided that this company itself does not have a single shareholder with more than 24.99% of ownership). The different types of shareholders recorded in the database include banks, financial/insurance companies, fund families, as well as firm directors/employees/managers.[29] Overall, we are able to identify ownership data for 62% of the firms in our sample, which corresponds to 300 firms (175 public and 125 private firms) and 1,063 loans.

We use the natural logarithm of the number of reported shareholders [Log(Owners)] as a proxy for ownership concentration.[30] The results are reported in Table 9. Even after controlling for ownership, private firms still pay 21 bps higher loan spreads than public firms (Column 1). However, ownership structure itself is an important factor in explaining loan spreads. For

instance, increasing the number of shareholders from the highest to the lowest ownership concentration quartile reduces loan spreads by 25 bps. As the variation in the number of shareholders is rather limited in the subsample of private firms, we run our tests separately for private and public firms instead of using interaction terms. The results are reported in Columns 2 and 3 of Table 9. The coefficient on the ownership variable is insignificant in the subsample of private firms (Column 3), but highly significant and negative in the public firm sample (Column 2).

Insert Table 9 about here.

We use the Herfindahl-Hirshman-Index (HHI) as an additional proxy of ownership concentration and calculate the HHI with the percentage ownership share of each reported shareholder. We divide our sample of public firms into public firms with high and low ownership concentration and compare their loan spreads to spreads of loans to private firms. We do not split our private firms into low versus high ownership firms as there is little variation in the ownership measure. We define ownership concentration as follows: ownership concentration is high (low) if the HHI is above (below) 0.67. Public firms with highly concentrated ownership are then comparable to private firms.[31] In Column (4), we introduce two interaction terms, where Public x HHI(LOW) is a dummy variable equal to one if public firms have low ownership concentration, and where Public x HHI(HIGH) is a dummy variable equal to one if the public firms have high concentrated ownership. Private firms are the omitted group. We find that even public firms with high ownership concentration still pay, on average, 40 bps lower loan spreads than private firms. This result is significant at the 1% level and economically meaningful. To summarize our results,

we find that concentrated (insider) ownership can potentially explain higher spreads of private firm loans.

5.3.2. Private Equity Ownership

The UK experienced a dramatic increase in buyout activity during the last years of our sample period. The deal value increased from GBP 17 bn in 2003 to GBP 45 bn in 2007.[32] Companies that are owned or managed by private equity firms may well be inherently different than other firms and this difference might be reflected in loan spreads. Specifically, private equity financed firms employ a higher level of leverage increasing firm bankruptcy risk.[33] This is likely to be particularly severe for smaller, private firms. In order to examine the impact of private equity firms, we supplement our data by tracking private equity involvement/ownership for each individual company.

To do this we need to rely on a number of different data sources. First, LPC Dealscan contains the field "loan purpose comment" that provides information regarding whether the deal is a buyout transaction, and "sponsor" indicating the name of the private equity sponsor(s) involved in the transaction. We obtain information about all public-to private transactions (PtP) in the UK from Mergermarket and complement these data with information from Hoover's Corporate History database. We further examine, for each company name, the investments listed on the websites of the private equity sponsors and press articles using various sources (Factiva, Business Week, etc.). For each loan, we know exactly whether the associated deal is: 1) a PtP, 2) a LBO/MBO (other than a PtP), 3) an acquisition, or 4) a recapitalization. We provide some descriptive statistics of these deals below.

Our data indicate that 17% of all loans received by public firms are associated with PtP transactions, 1% with LBO/MBO transactions, and 1% with other private equity backed transactions such as acquisitions or recapitalization. There are no private equity firms involved in 81% of the loans in our sample. However, 66% of the loans to private firms have some private equity participation. The majority of these private firm loans (49%) are associated with LBO/MBO's and 17% with other private equity backed transactions.

The effects of private equity involvement are reported in Columns 5 and 6 of Table 9. The regressions include all control variables as described in Section 4 (the coefficients on these variables are not shown), as well as the following variables to control for private equity involvement: PtP is a dummy variable equal to one if the firm is taken private, LBO/MBO is a dummy variable equal to one if the deal is a buyout, but the firm is not taken private, and Private Equity (Not Buyout) is a dummy variable equal to one if the deal involves a private equity sponsor, but is not a buyout transaction. Our major finding, that private firms pay higher spreads compared to public firms, still holds. Private firms pay approximately 24 bps higher spreads than public firms. This difference is highly significant (Column 5). Nevertheless, the influence of private equity participation on loan spreads is considerable with private equity owned firms paying 55 bps to 85 bps higher spreads relative to those firms free of private equity participation.

A natural question that arises is what is the loan spread difference between private and public firms without private equity involvement? Further, what is the difference in spreads between public companies backed by private equity firms and non-private equity backed private firms? If private equity involvement increases loan spreads, the loan spread disadvantage of private firms should be reduced once this effect is controlled for. To examine these questions, we include the interaction term Public x Private Equity in our regression. This interaction term is

equal to one if the firm is public and the deal involves a private equity sponsor. This variable captures all the deals of public firms with private equity participation. The results are reported in Column 6 of Table 9. Three interesting results emerge. First, if no private equity is involved, private firms pay 26 bps higher loan spreads as compared to public firms. The difference is significant at the 1% level. This is consistent with our earlier results that information imperfections are of first order of importance in explaining the loan cost disadvantage of private firms. Additionally, private firms managed or owned by private equity pay 66 bps higher loan spreads compared to private firms that are not backed by private equity. This is consistent with banks demanding a premium for investing along with private equity firms. Moreover, the diagnostic section of Table 9 reports the Wald test under the hypothesis that spreads for public firms backed by private equity are not significantly different from spreads paid by private firms with private equity involvement. We cannot reject this hypothesis at a meaningful level of confidence (p-value is 0.945). This corresponds to our earlier intuition that the spread difference is reduced (and even disappears) if deals by public firms involve private equity.

Taken together, there is evidence that ownership and/or governance of firms is an important channel through which loan spreads can be affected.

5.4. Secondary Market Trading

A fourth channel that may explain the loan cost disadvantage of private firms relates to whether or not loans are traded in the secondary loan market after origination. Selling a proportion of the loan allows lenders to hedge their exposure to one particular borrower or industry ("diversification" effect), which, ceteris paribus, should reduce loan spreads. There is also substantial evidence that banks get access to private information when they extend loans to

firms (James, 1987; Lummer and McConnell, 1989; Best and Zhang, 1993; Billett et al., 1995). Secondary loan prices reveal information about the firm to investors and may lead to a reduction in the cost of debt ("information" effect) by reducing the information premium demanded by banks or by reducing the informational advantage of relationship banks (Rajan, 1992). An alternate argument may be that banks are able to reduce their exposure to borrowers by selling (a portion of) their loan share in the secondary market. In the syndication process, lead banks retain a share of the loan as a commitment device to diligently monitor the borrower (Sufi, 2007; Bharath et al., 2007), which might be effectively reduced when the loan is sold. If loan trading undermines monitoring, the scope for risk shifting is increased. This might lead to a wealth transfer from debtholders to shareholders and, as such, to higher spreads demanded by lenders ("monitoring" effect). In other words, loan sales might increase or decrease the loan cost disadvantage of being private.

To examine this, we supplement our dataset using daily secondary market loan prices from 1999-2007 from the Loan Syndication and Trading Association (LSTA) and Loan Pricing Corporation (LPC) market-to-market pricing service.[34] This dataset includes daily bid and ask quotes aggregated across dealers, the number of dealers providing bid and ask quotes, a unique loan identification number (LIN), the borrower name, the loan type, and the pricing date. Panel A of Table 10 provides some descriptive statistics about the distribution of loans in our sample that have been traded after origination for both cohorts, private and public firms. We refer to loans that have been traded as "traded" and those that have not been traded as "not traded," respectively. Generally, 10% of all loans in our sample are liquid, and the percentage is even higher for loans received by private firms (i.e., 12.5% vs. 7.8% for loans received by public firms). Until 1999, secondary loan trading was virtually non-existent in Europe as reflected in

our sample. Even from 1999-2002, only a small number of loans were traded after origination.[35] Those loans that were traded were predominantly loans to public firms. Since 2003 and, particularly, during the last three years of our sample period (2005-2007), a growing number of loans to private firms have been actively traded in the secondary loan market reflecting the substantial increase in buyout activity in the UK. For example, we find that 14% of loans in our sample that are linked to transactions with private equity firm participation were subsequently traded in the secondary loan market (compared to 7% of the non-private equity backed deals). The average number of dealers providing bid and ask quotes is 3.2, the average number of trading days is 462, and 68% are non-zero return trading days.

Insert Table 10 about here.

We add the dummy variable Traded which takes a value of one if the loan is traded in the secondary loan market after origination to our regression. The results are reported in Panel B of Table 10. Column 1 reports that traded loans have 30 bps higher loan spreads, consistent with the monitoring effect described above.[36] Arguably, private firms are inherently more opaque and more difficult to monitor. For such firms, the risk shifting problem should be more relevant. In Column 2, we test this hypothesis by adding the interaction term Public x Traded to the regression. We document that the coefficient of the interaction term is negative and significant. We test the null hypothesis that the magnitude of the coefficients of Traded and the interaction term are identical and cannot reject this hypothesis at a meaningful level of confidence (p-value is 0.252). While traded private firm loans have higher loan spreads relative to non-traded loans, we cannot find a statistically significant difference between traded and not-traded public firm

loans. Taken together, secondary market trading is a channel that can explain the loan cost disadvantage of private versus public firms.

5.5. Future Performance

The final potential mechanism we analyze is the differences in expected future performance of private versus public firms. Our hypothesis is that loans to private firms have higher loan spreads as public firms are less risky than private firms or they differ in terms of their future investment opportunities. Lenders may anticipate these performance differences and ex-ante demand higher spreads for private firm loans. To examine this, we calculate one, two, and three year sales growth rates for private and public firms and use them as additional control variables. The results are reported in Table 11. Models (4)-(6) also add interaction terms with Public. To summarize our results, we do not find evidence that differences in expected future performance prompt lenders to ex-ante increase spreads on private firm loans. We use a variety of proxies related to future credit quality and performance. They include differences in Z-Score, rating downgrade probability, defaults, and the performance of the traded loans in the secondary markets. In all tests, we find significantly higher loan spreads of private relative to public firm loans after controlling for future performance.[37]

Insert Table 11 about here.

5.6. Comparison of Mechanisms

In the previous sections, we document five channels through which loan spreads and loan spread differences between public and private firms are potentially affected: 1) bond market

access, 2) relationships, 3) stock exchange listing, 4) ownership, and 5) secondary market trading. To assess the relative importance of each of these channels, we test a full model consecutively adding proxies for the individual channels to our regression framework. The results are reported in Table 12. Model (1) of Table 12 repeats Model (7) from Table 8. We add the relationship channel (Column 2), stock exchange listing (Column 3), insider ownership (Column 4), private equity ownership (Column 5), and secondary market trading (Column 6) to our empirical model. For example, in Model (2), we report the results for estimating the effect of bond market access and lending relationships on loan spreads. Consistent with the results presented earlier in this paper, we find that private firms benefit from bond market access paying lower spreads while the effect is not significant for public firms.[38] Similarly, having a previous relationship with the lead arranger increases loan spreads, but only for private firms. This interpretation extends to the other models and controlling for all other channels that affect loan spreads. Again, the coefficient of SMALL CAP/AIM is positive and significant implying that firms listed on opaque segments of the stock exchange do not receive a significant loan cost benefit relative to privately-held firms. We do not find evidence that insider ownership affects loan spreads. However, consistent with our earlier results, we determine that private equity ownership and loan sales are two important channels through which loan spread differences between private and public firms can be explained.

6. Conclusion

We examine a unique dataset of private and public U.K. companies borrowing in the syndicated loan market and estimate the relative loan cost disadvantages of private relative to public firms. This is important as private firms represent a large fraction of loan markets and the

economy in general. As this database provides extensive and detailed information regarding private borrowers' financial performance at the time a loan is originated, it is ideal to test whether it is costly, in terms of borrowing costs, to be a privately-held firm. We examine, in particular, whether private debt costs may offset benefits from going private. We find that private firms pay, on average, 27 bps higher loan spreads than public firms.

We carefully acknowledge the potential endogeneity of being public using various econometric methodologies including Propensity Score Matching Methods and Instrumental Variables Tests, Treatment Effects Models. All tests support our findings of a sizable loan cost disadvantage of being private.

We then analyze the channels of this loan cost disadvantage of being private examining: 1) the higher cost of information production, 2) less bargaining power, 3) differences in ownership structure, 4) secondary market trading, and 5) future performance, and exploit the large cross-sectional variation among our sample firms. We empirically establish a number of new results. First, having access to public bond markets is particularly valuable for private firms shifting bargaining power from the lender to the borrower. Additionally, we find that being listed in and of itself does not eliminate a loan cost disadvantage if the IPO results in a listing on a relatively small secondary market such as the AIM. Moreover, private equity participation results in higher loan costs associated with these deals. However, loan spread differences are reduced or disappear if deals by public firms involve private equity. Furthermore, secondary market trading increases the scope for risk shifting due to reduced monitoring that leads to higher loan spreads for private firms.

We further establish a stylized fact that firm location does not matter in loan pricing in the syndicated loan market. Constructing a measure for the closest distance between the firm's

headquarters and the branch of the lead arranger, we do not find evidence that firm/branch distance has a significant effect on loan spreads, which is independent of firm size. Even private firms have access to large foreign banks and generally maintain relationships to the same top lead arrangers as public firms.

There are several avenues for further research. First, there is limited literature studying private versus public firms. Our results suggest that whether or not a firm is publicly traded is less important, once private firms have access to public debt or when firms are listed on illiquid segments of a stock exchange. It might be interesting to investigate which of these firms might be more financially constrained. For example, are private firms with public debt less constrained than public firms without public debt after the onset of the financial crisis when banks stopped lending? Additionally, we find four channels through which loan spreads are affected. It might be interesting to relate our findings to the "loan spread puzzle" documented in Carey and Nini (2007) and to explore whether these channels potentially explain loan spread differences between the U.S. and the UK loan market.

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Endnotes

[1] For example, in the U.S., 50.5% of all syndicated loans that originated from 1987-2007 were allocated to private firms. Over 95% of firms in the UK are privately owned and are responsible for more than half of the UK GDP. Similarly, the U.S. Small Business Administration reports that in 1998, businesses with fewer than 500 employees accounted for more than half of the U.S. GDP.

[2] There is also a considerable overlap in the corporate governance structures between the U.S. and UK financial systems (Acharya et al., 2011; Allen et al., 2006).

[3] Specifically, our data set contains four groups of UK borrowing firms: 1) private firms that remain private, 2) private firms that go public during or after our sample period, 3) public firms that remain public, and 4) public firms that go private. For all firms, we have a wide array of borrower and loan characteristics. We have the loan spread (above a reference rate) for each private and public firm loan and can follow firms through time whether they are private or public.

[4] Hale and Santos (2009), among others, confirm that informational asymmetries are significantly reduced after a firm's bond IPO.

[5] Exceptions in the literature are Pagano et al. (1998), Boehmer and Ljungqvist (2004), Helwege and Packer (2004), Chemmanur et al. (2010), Schenone (2010) and Asker et al. (2010).

[6] This section is primarily based on the discussion in Ball and Shivakumar (2005) and Brav (2005).

[7] The main functions of the Companies House are to ”incorporate and dissolve limited companies; [to] examine and store company information delivered under the Companies Act and related legislation; and [to] make this information available to the public.” (http://www.companieshouse.gov.uk/about/functionsHistory.shtml)

[8] The Companies Act 1985 was amended in 1989. The Companies Act 2006 overrules the Companies Act of 1989 and, even though it was intended to simplify regulations, it could not be implemented immediately, but continued through 2007. The new act makes public companies subject to more stringent regulation whereas it relaxes the requirements for private companies. (For further reference to the Companies Act 2006, please visit the Office of Public Sector Information in the UK at http://www.opsi.gov.uk/acts/acts2006/).

[9] For detailed explanatory notes on reporting requirements and disclosure exemptions, please refer to http://www.companieshouse.gov.uk/about/gbhtml/gba3.shtml#three).

[10] For fiscal years ending earlier than January 30, 2004, the following criteria were valid: 1) annual turnover must be GBP 2.8 million (GBP 11.4 million) or less, 2) the balance sheet total must be GBP 1.4 million (GBP 5.6 million) or less and 3) the average number of employees must be 50 (250) or fewer.

[11] Before June 2000, the threshold was GBP 350,000.

[12] LPC is commonly used in the literature on syndicated loans and lending relationships (see Bharath et al., 2007; Drucker and Puri, 2005 and the references cited therein). A good description of LPC is provided in Strahan (1999).

[13] As further described in the appendix, all limited liability companies have to file their financial statements with the UK Companies House under the UK Companies Act.

[14] The "WebCheck-Service" is available under http://wck2.companieshouse.gov.uk.

[15] Tests for difference in medians provide qualitatively similar results.

[16] However, testing for the difference in medians provides evidence that public firms are more profitable than private firms. Additionally, private firms have higher (median) sales growth rates than public firms.

[17] Our analysis is done at the facility level. As in some cases, deals are made up by multiple facilities. We verify that our results hold at the deal level.

[18] We do other robustness tests as well. For example, we estimate the regressions separately in subsamples of term loans and revolver loans and find that the coefficient on Public is twice as high in the subsample of terms loans. A possible reason for this is that other banks usually buy

tranches in revolving syndicated loans. Since banks should have superior monitoring and screening abilities, they are more likely to be better informed than institutional investors who regularly hold syndication segments in term loans (Ivashina and Sun, 2010). For brevity, we do not report these results.

[19] This method is in line with prior research in this area (Drucker and Puri, 2005; Bharath et al., 2008) and accounts for the asymmetric distribution of the propensity score in our sample.

[20] In unreported tests, we sort firms by propensity score to test our inference from Figure 1, splitting our sample into three groups of propensity scores based on the number of firms within each group. The mean spread among private and public firm loans is decreasing from Group 1 (with the lowest propensity scores) to Group 3 (with the highest propensity scores). The difference between private and public firm's loan spreads is decreasing as suggested by Figure 1. While the difference in Group 1 is 84 bps and statistically significant at the 1% level, the difference is reversed in Group 3, but is not statistically (and economically) significant anymore.

[21] In further tests (which are reported in an online appendix to this paper), we use two additional instruments. We use a variable that proxies for the visibility of the firm and include the natural logarithm of one plus the number of public firms in the same two-digit SIC code as a percentage of all public UK based companies as an additional instrument. We also include a lagged variable of being public indicating that the firm has already been public for at least three years prior to loan origination. To summarize our results, we find supporting evidence that private firms pay significantly higher spreads.

[22] We are able to collect information about the closest RBS and Barclays branch for each borrower ZIP code using the branch finder on their websites: http://ask.barclays.co.uk/branchfinder?site=commercial (Barclays) and http://www.rbs.co.uk/corporate/contact-us/new-customer.ashx (RBS).

[23] We find evidence in our data to support this explanation. For example, we find that private firms have 10% higher leverage ratios as compared to public firms. Looking at bank borrowing of our sample firms, we also find that loan size as a percentage of total assets is twice as large for private firms. These firms are, ceteris paribus, more risky thereby explaining higher spreads.

[24] FTSE 100 and FTSE 250 firms represent 96% of the UK market capitalization (http://www.ftse.com/Indices/UK Indices/index.jsp).

[25] Furthermore, reporting the results separately for private firms with (Bonds) and without (No Bonds) bond market access, we find that firms that have issued public bonds in the past are even larger in size than FTSE 250 firms, but pay somewhat higher spreads on their loans. However, they pay lower spreads when compared to Small Cap or AIM firms. Alternatively, the asset size of private firms without bond market access is only a quarter of the size of private firms with bond markets access and they pay more than twice their spread, on average.

[26] Consistent with our earlier results, we also find that private firms with access to bond markets do not pay higher spreads compared to FTSE 100/FTSE 250 firms. Conversely, private firms

without public debt pay 62 bps higher loan spreads than the omitted group of firms. Private firms that have issued bonds have more information readily available for investors relative to Small Cap/AIM firms leading to lower relative costs of private debt. In unreported tests, we also use the number of analysts that issue earnings forecasts about a public borrower at the time of the loan as proxy for information ability about public firms. A testable hypothesis is that the loan cost difference between public and private firms should be lower if public firms have low analyst coverage. We obtain these data from I/B/E/S. We still find that public firms pay lower loan spreads than private firms. However, we do not find evidence to support our hypothesis. Analyst coverage does not significantly influence spreads on loans received by public firms, a result consistent with banks having superior monitoring and information advantages when compared to outside analysts.

[27] For example, Bharath et al. (2008) document that rated (public) firms do not receive a loan cost related benefit from relationships.

[28] Figures refer to August 2007. About 20,000 new links are added each month.

29 Unfortunately, there is no percentage ownership of family shareholdings available for the companies in our dataset. Thus, we are unable to separate family-owned firms from the rest of the sample.

[30] Note that this number does not include private (unnamed) shareholders. The database only reports the aggregated percentage ownership of these shareholders. The average number of

reported shareholders for public (private) firms is 40.42 (2.48) with a standard deviation of 26.13 (3.98). In addition, 75% of public (private) firms have less than 61 (2) shareholders and the maximum number of shareholders is 93 (38).

[31] For example, the average number of shareholders of private and public firms with highly concentrated ownership is 2.2 and 4.5, respectively. For comparison, the average number of shareholders of public firms with low concentrated ownership (lowest tercile) is 54.2.

[32] Center of Management Buyout Research, http://www.nottingham.ac.uk/business/cmbor/

[33] For example, we find that the relative loan size (as a percentage of total assets) is 23% larger for buyout transactions as compared to other deals.

[34] For more details regarding the secondary loan market and this dataset, see Gande and Saunders (2010) and Wittenberg-Moerman (2008).

[35] Gadanecz (2004) reports that in 2003, about 11% of all loan originations in the UK were traded in the secondary loan market. This figure has doubled since 2002.

[36] Our results support the findings in Gande and Saunders (2010) who document negative abnormal bond returns around the first trading of a borrower's loan.

[37] We do not report the tables for compactness, but present a subset of the results in an online appendix.

[38] The diagnostic section reports the Wald test under the hypothesis that the sum of interaction term and BONDS is equal to zero in a similar fashion compared to Table 6. We cannot reject the null at a meaningful level of confidence.

Table 1

Descriptive statistics of loan facilities

Calender Time Distribution of

	Panel A: Loans			**Panel B: Loan Amounts**		
Year of Loan	Private	Public	Total	Private	Public	Total
1989	3	3	6	1,000	288	644
1990	3	3	6	56	718	387
1993	1	5	6	591	232	292
1994	4	10	14	234	378	337
1995	4	18	22	34	936	772
1996	3	20	23	157	727	653
1997	3	21	24	286	377	365
1998	6	56	62	245	419	402
1999	40	75	115	126	575	419
2000	59	115	174	850	1,058	988
2001	43	91	134	530	396	439
2002	55	80	135	98	337	239
2003	69	78	147	228	366	301
2004	121	87	208	168	539	323
2005	175	81	256	122	717	310
2006	227	51	278	108	743	225
2007	193	39	232	341	1,539	543
Total	1,009	833	1,842	5,174	10,345	15,519

Panel C: Industry classification of borrowers

SIC Code	Private	Public	Total
1	26	75	101
2	164	148	312
3	152	93	245
4	141	186	327
5	147	155	302
7	284	129	413
8	91	44	135
9	1	1	2
Total	1,006	831	1,837

Panel D: Loan Purposes

Loan Purpose	Private	Public	Total
Acquisition related	610	135	745
Corporate purposes	62	170	232
Capital structure	236	260	496
Project finance	23	22	54
Other	78	246	254
Total	1,009	833	1,842

Table 2

Summary Statistics for Key Loan and Borrower Characteristics

Variable	N	Mean	Std.Dev.	Min	25th Pctile	Median	75th Pctile	Max
Panel A: Loan Characteristics								
AISD (Basis Points)	1,842	197.11	178.96	17.5	75	175	250	1,000
Loan Facility Amount ($ Millions)	1,842	417.38	1,07.75	0.4	41.37	129.65	377.91	17,796.23
Maturity of Loan (Months)	1,842	68.19	36.1	1	60	60	84	310
Collateral	1,842	0.26	0.44	0	0	0	1	1
Term Loan	1,842	0.34	0.47	0	0	0	1	1
Refinancing	1,842	0.32	0.47	0	0	0	1	1
Panel B: Borrower Characteristics								
Borrower Assets ($ Millions)	1,842	4,948.46	21,242.02	4.53	215.63	684.02	2,553.28	277,113.20
Leverage	1,842	0.27	0.25	0	0.06	0.21	0.39	0.85
Coverage	1,842	14.81	45.88	-0.96	1.59	3.55	7.32	575.62
Tangible	1,842	0.36	0.27	0	0.13	0.29	0.57	0.97
Profitability	1,842	0.07	0.09	0	0.002	0.06	0.11	0.58
Cash & Equivalents	1,842	222.76	723.68	0	7.45	27.63	123.33	8,459
Age	1,842	28.18	29.56	0.19	6.43	15.9	40.99	125.99
Growth	1,842	0.12	0.69	-6.09	0.002	0.11	0.26	8.66
Investment Grade	333	0.61	0.49	0	0	1	1	1
Not Rated	1,842	0.82	0.38	0	1	1	1	1

Table 3

Key Loan and Borrower Characteristics – Private vs. Public Borrowers

Panel A segregates the entire sample in private and public loans. The first two columns report the mean (medians in parentheses) values for various price and non-price terms of loan contract. Panel B provides similar details for borrower-specific characteristics. The last column provides t-statistic for difference in means (z-statistic for Wilcoxon Rank sum test).

Variable	Private (Public=0) (A)	Public (Public=1) (B)	t-statistic (A)-(B) (Wilcoxon Sum Test)
Panel A: Loan Characteristics			
AISD (Basis Points)	266.7	113.86	17.184***
	(203.54)	(97.96)	(20.601***)
Loan Facility Amount ($ Millions)	236.71	636.22	-7.82***
	(877.14)	(1241.38)	(-19.82***)
Maturity of Loan (Months)	82.21	53.47	18.11***
	(33.05)	(33.27)	(21.88***)
Collateral	0.39	0.11	14.72***
	(0.4)	(0.31)	(13.44***)
Term Loan	0.41	0.26	6.73***
	(0.49)	(0.44)	(-11.95***)
Refinancing	0.21	0.47	-12.20***
	(0.4)	(0.5)	(-11.95***)
Panel B: Borrower Characteristics			
Total Assets ($ Millions)	1,616.32	8,984.63	-6.96***
	(303.76)	(1584.45)	(-21.21***)
Leverage=(LT Debt/Total Assets)	0.28	0.25	2.83***
	(0.29)	(0.2)	(-1.64)
Coverage=(EBITDA/Interest)	18.51	9.69	4.07***
	(51.19)	(36.76)	(2.12**)
Tangibility=(Tangibles/Total Assets)	0.34	0.38	-2.93***
	(0.27)	(0.28)	(-2.46**)
Profitability=(EBITDA/Sales)	0.07	0.07	0.05
	(0.09)	(0.09)	(-1.79*)
Cash & Equivalents	66.68	411.81	-9.68***
	(300.9)	(991.88)	(-18.04***)
Age	23.26	34.14	-7.80***
	(25.63)	(32.81)	(-7.56***)
Growth	0.1	0.14	-1.19
	(0.84)	(0.47)	(2.87***)
Investment Grade	0.03	0.2	-11.15***
	(0)	(0)	(-11.44***)
Not Rated	0.92	0.7	11.92***
	(1)	(1)	(11.96***)

Table 4

OLS Estimates

The table reports coefficient estimates from OLS regressions. The dependent variable is the AISD measured as the spread above LIBOR. Public is a dummy variable measuring whether the firm is stock exchange listed. Column (1) shows the effect of being public including only borrower characteristics, column (2) only includes loan characteristics and column (3) includes all borrower and loan control, respectively. All variables are defined in the Appendix. All regressions further include loan purposes: acquisition, corporate purposes, capital structure related purposes, project finance related purposes and other (which are ommitted), as well as time and industry fixed effects. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	**(1)**	**(2)**	**(3)**
Public	-41.762***	-25.716***	-27.381***
	(5.321)	(4.695)	(4.759)
Profitability	-1.696***		-1.231***
	(0.470)		(0.439)
Growth	22.292***		16.257**
	(8.681)		(8.059)
Leverage	18.694		20.178*
	(11.905)		(10.403)
Log(Cash)	0.019*		-0.004
	(0.010)		(0.008)
Log(Assets)	-24.573***		-1.592
	(2.140)		(2.405)
Log(Age)	1.595		2.997*
	(2.012)		(1.740)
Tangible	-20.495***		-19.644***
	(7.845)		(7.361)
Log(1+Interest Coverage)	1.595		3.212
	(3.357)		(3.007)
Investment Grade	-96.214***		-72.054***
	(10.374)		(10.351)
Not Rated	-64.583***		-55.174***
	(9.824)		(9.494)
Term Loan		36.653***	32.838***
		(4.321)	(4.172)
Log(1+Maturity)		36.510***	30.649***
		(4.074)	(4.056)
Log(Loan Size)		-20.747***	-16.875***
		(1.716)	(2.312)
Covenants		24.575***	17.298***
		(6.478)	(6.255)
Secured		12.432	22.770**
		(8.771)	(10.875)
Secured Missing		12.432	4.220
		(8.771)	(8.437)
Refinancing		-7.445	-7.385*
		(4.769)	(4.427)
Loan Purpose Control	NO	YES	YES
Year Fixed Effects	YES	YES	YES
Industry Fixed Effects	YES	NO	YES
Number Obs.	1,764	1,764	1,764
R^2	0.476	0.566	0.601

Table 5

Endogeneity Tests: Instrumental Variables and Treatment Effects Models

The table reports the results of an instrumental variables (IV) estimation and Treatment Effects Model with log(1+distance) as an instrument. Distance is measured as the distance of the firm and London capital markets.Columns (3) and (4) report the results from the Treatment Effects Model. All variables correspond the ones used in model (4) in Table 4. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

	IV Model		**Treatment Effects Model**	
	Public	**AISD**	**Public**	**AISD**
Variable	**(1)**	**(2)**	**(3)**	**(4)**
Public	N/A	-48.793***	N/A	-47.610***
		(13.617)		(11.798)
Profitability	0.001	-1.740***	0.012	-1.744***
	(0.001)	(0.538)	(0.012)	(.538)
Growth	0.035***	11.164**	0.269***	11.111**
	(0.035)	(5.463)	(0.091)	(5.455)
Leverage	0.116***	12.220	0.736**	12.137
	(0.033)	(17.171)	(0.315)	(17.165)
Log(Cash)	0.0008***	-0.003	0.0003**	-0.003
	(0.0001)	(0.006)	(0.0001)	(.006)
Log(Assets)	0.011	-1.399	0.194***	-1.491
	(0.008)	(4.029)	(0.070)	(3.994)
Log(Age)	-0.008	0.866	-0.250***	0.807
	(0.006)	(3.224)	(0.055)	(3.207)
Tangible	-0.020	-26.565**	-0.052	-25.531*
	(0.026)	(13.488)	(0.245)	(15.297)
Log(1+Interest Coverage)	-0.010	7.413	-0.123*	7.431
	(0.007)	(4.639)	(0.072)	(4.637)
Investment Grade	-0.150***	-78.062***	-1.421***	-77.812***
	(0.035)	(18.452)	(0.323)	(18.396)
Not Rated	-0.103***	-72.233***	-0.674***	-72.093***
	(0.028)	(14.831)	(0.184)	(14.81)
Term Loan	-0.002	7.453	0.092	7.484
	(0.014)	(7.567)	(0.126)	(7.565)
Log(1+Maturity)	-0.032***	45.755***	-0.257*	45.811***
	(0.012)	(6.478)	(0.104)	(6.47)
Log(Loan Size)	0.005	-17.325***	-0.072***	-17.348***
	(0.007)	(3.668)	(0.060)	(3.666)
...				
Log(1+Distance)	-0.013***	N/A	-0.122***	N/A
	(0.003)		(0.029)	
Number Obs.	1,764	1,764	1,764	1,764
Adj. R^2	0.472	0.609		
F-Test	25.15***			
λ (p-value)				-8.914 (0.347)

Table 6

Bond Market Access

This table reports the results for the impact of the cost of information production on loan spreads for private versus public firms. It presents alternative proxies to characterize the information availability of private versus public firms. The dependent variable is the All-In-Spread-Drawn (AISD). This table only reports the coefficient estimates for the main explanatory variables. The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see Table 4 for a definition of these variables). Panel B reports the results for the impact of bond market access on loan spreads for private versus public firms. Bonds is a dummy variable equal to one if the firm has issued public debt in the past. Last Bond Public is a dummy variable equal to one if the last bond of the firm has been a public bond. Log(1+Prior Public Bonds) is the natural logarithm of one plus the number of bonds issued by the borrower prior to loan origination. Log(1+Prior Public Bonds) is the natural logarithm of one plus the number of public bonds issued by the borrower prior to loan origination. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Public	-26.96***	-27.185***	-27.254***	-34.213***	-32.084***	-31.542***	
	(4.718)	(4.740)	(4.742)	(5.215)	(5.087)	(5.046)	
(1) Bonds	-7.768			-45.736***			
	(5.373)			(8.398)			
(2) Last Bond Public		-3.474			-38.655***		
		(5.604)			(19.179)		
(3) Log(1+Prior Bonds)			-2.369			-19.629***	
			(3.471)			(5.654)	
(4) Public x Bonds				46.453***			
				(9.051)			
(5) Public x Last Bond Public					42.128***		
					(10.032)		
(6) Public x Log(1+Prior Bonds)						19.173***	
						(4.828)	
Public x No Bond							0.565
							(7.942)
Private x Bonds							-11.953
							(9.349)
Private x No Bonds							34.117***
							(6.711)
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Wald-Test: |(1)|=|(4)| [p-value]				0.901			
Wald-Test: |(2)|=|(5)| [p-value]					0.564		
Wald-Test: |(3)|=|(6)| [p-value]						0.894	
Number Obs.	1,764	1,764	1,764	1,764	1,764	1,764	1,764
R^2	0.602	0.601	0.606	0.609	0.608	0.607	0.605

Table 7

Exchange Listings

Due to data limitations, we run tests for (i) and (iii) using a subset of public firms where (historic) information about segment affiliation and index membership is available. Panel A shows descriptive statistics (borrower total assets (Total Assets), loan spread (AISD), the number of shareholders (Owner) and loan tenor (Tenor)) for firms within the different trading segments on the Main Market (FTSE 100, FTSE 250, Small Cap, Other) and the Alternative Investment Market (AIM). We also include the descriptive statistics for private firms. Panel B reports the regression results. Columns (1) and (2) show the results using segment affiliation as information proxy. FTSE 100/FTSE 250 is a dummy variable equal to one if the firm's equity is traded on these two segments. Small Cap/Other/AIM is a dummy variable equal to one if the firm's equity is traded on these segments. Column (1) shows results only for public firms.Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Segment	**Total Assets** ($ millions)	**AISD** (bps)	**Owner** (Number)	**Tenor** (years)
1. Public Firms				
Main Market				
FTSE 100	14,212	98	59	3.66
FTSE 250	2,029	101	57	3.73
Small Cap	621	177	31	4.03
Other	605	162	34	3.92
AIM				
AIM	175	142	19	4.09
2. Private Firms				
Bonds	4,068	120	2	3.73
No Bonds	969	244	2	4.34

Variable	**(1)**	**(2)**	**(3)**
FTSE 100/FTSE 250	-32.328***	-39.028***	
	(11.263)	(7.113)	
Small Cap / AIM		-16.410	29.678***
		(9.972)	(10.133)
Private x Bonds			2.924
			(7.812)
Private x No Bonds			61.911***
			(7.641)
Borrower Characteristics	YES	YES	YES
Loan Characteristics	YES	YES	YES
Loan Purpose Control	YES	YES	YES
Year Fixed Effects	YES	YES	YES
Industry Fixed Effects	YES	YES	YES
N	403	1,240	1,240
R^2	0.694	0.601	0.621

Table 8

Bargaining Power

This table reports the results for the impact of relationships on loan spreads for private versus public firms. The dependent variable is the All-In-Spread-Drawn (AISD). The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see Table 4 for a definition of these variables). Private is a dummy variable equal to one if the firm is not stock exchange listed. Rel(Dummy) is a a dummy variable equal to one if the borrower had a relationship with the lead bank in the previous 5 years of borrowing history of the firm. Rel(Number) measures the strength of the relationship based on the number of loans by the lead bank to the borrower relative to the total number of loans by this borrower in the last 5 years. Rel(Amount) measures the strength of the relationship based on the amount of loans by the lead bank to the borrower relative to the total amount of loans by this borrower in the last 5 years. Bonds is a dummy variable equal to one if the borrower has issued public bonds in the past. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Public	-27.349***	-27.065***	-27.233***	-18.954***	-20.845***	-19.952***	
	(4.777)	(4.772)	(4.769)	(5.558)	(5.541)	(5.521)	
Private							24.058***
							(5.922)
(1) Rel(Dummy)	8.119**			21.965***			-5.313
	(4.074)			(6.512)			(6.025)
(2) Rel(Number)		15.597**			33.291***		
		(6.416)			(10.464)		
(3) Rel(Amount)			11.297*			32.265***	
			(6.322)			(10.524)	
(4) Rel(Dummy) x Public				-23.682***			
				(7.925)			
(5) Rel(Number) x Public					-30.337**		
					(12.716)		
(6) Rel(Amount) x Public						-35.111***	
						(12.640)	
Bonds							1.180
							(9.274)
Rel(Dummy) x Bonds							2.035
							(10.972)
Rel(Dummy) x Private							31.280***
							(8.932)
Bonds x Private							-35.990***
							(13.435)
Rel(Dummy) x Private x Bonds							-37.190**
							(18.123)
Borrower Characteristics	YES	YES	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Wald-Test: |(1)|=|(4)| [p-value]				0.729			
Wald-Test: |(2)|=|(5)| [p-value]					0.703		
Wald-Test: |(3)|=|(6)| [p-value]						0.707	
N	1,764	1,764	1,764	1,764	1,764	1,764	1,764
R^2	0.602	0.607	0.606	0.604	0.608	0.608	0.613

Table 9

Ownership Structure

This table reports results for the impact of ownership structure on loan spreads. Panel A analyzes how insider ownership affects lown spreads.The dependent variable is the All-In-Spread-Drawn (AISD). This table only reports the coefficient estimates for the main explanatory variables. The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see Table 4 for a definition of these variables). Owners denotes the number of shareholders of the borrower. Columns (1) to (3) report the results using the number of owners as proxy of insider ownership. Column (1) reports the results for the full sample. Columns (2) and (3) show the impact of ownership in the subsample of public and private firms, respectively. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

		Insider Ownership			**Private Equity Ownership**	
		Private	Public			
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
(1) Public	-21.089***				-24.154***	-26.112***
	(8.103)				(5.308)	(5.205)
Log(Owners)	-7.903***	-4.309	-5.120***			
	(1.985)	(6.450)	(1.895)			
(2) Public x HHI (Low)				-44.343***		
				(7.370)		
(3) Public x HHI (High)				-25.851***		
				(8.616)		
PtP					84.731***	
					(9.801)	
LBO/MBO					55.408***	
					(8.561)	
Private Equity (Not Buyout)					82.714***	
					(9.173)	
Private Equity						65.689***
						(7.059)
(4) Public x Private Equity						26.678***
						(9.389)
Borrower Characteristics	YES	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Wald-Test: |(2)|=|(3)| [p-value]				0.009		
Wald-Test: |(1)|=|(4)| [p-value]						0.945
N	1,063	503	560	1,059	1,764	1,764
R^2	0.605	0.427	0.674	0.602	0.639	0.638

Table 10

Secondary Market Trading

This table reports results assessing the impact of loan liquidity on loan spreads. Panel A shows the calender time distribution of liquid versus illiquid loans for our full sample, and private and public cohorts, respectively. Panel B shows the regression results. The dependent variable is the All-In-Spread-Drawn (AISD). This table only reports the coefficient estimates for the main explanatory variables. The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see Table 4 for a definition of these variables). Liquid (Illiquid) is a dummy variable equal to 1 if the loan has (not) been traded in the secondary market after origination. Public is a dummy variable equal to 1 if the firm is stock exchange listed. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Panel A: Distribution of traded vs. not traded loans for private and public firms

	Full Sample			Private Firms			Public Firms		
Year	**Not Traded**	**Traded**	**Total**	**Not Traded**	**Traded**	**Total**	**Not Traded**	**Traded**	**Total**
1989 -1998	163	0	163	27	0	27	136	0	136
...									
1999	113	2	115	33	2	35	80	0	80
2000	168	6	174	47	0	47	121	6	127
2001	131	3	134	35	1	36	96	2	98
2002	121	14	135	41	4	45	80	10	90
2003	124	23	147	46	5	51	78	18	96
2004	163	45	208	91	24	115	72	21	93
2005	233	23	256	154	17	171	79	6	85
2006	224	54	278	153	43	196	71	11	82
2007	218	14	232	141	13	154	77	1	78
Total	**1,658**	**184**	**1,842**	**768**	**109**	**877**	**890**	**75**	**965**

Panel A: Regression results

Variable	**(1)**	**(2)**
Public	-25.328***	-21.796***
	(4.756)	(4.915)
(1) Traded	30.860***	45.186***
	(6.873)	(9.148)
(2) Public x Traded		-34.213***
		(12.902)
Borrower Characteristics	YES	YES
Loan Characteristics	YES	YES
Loan Purpose Control	YES	YES
Year Fixed Effects	YES	YES
Industry Fixed Effects	YES	YES
Diagnostics		
Wald-Test: (1)=|(2)| [p-value]		0.252
N	1,764	1,764
R^2	0.607	0.608

Table 11

Future Performance

This table reports the results for the impact of being public on loan spreads. The dependent variable is the All-In-Spread-Drawn (AISD). Sales Growth$_{t+1}$ is the sales growth over a one year period in the future. The other variables are defined accordingly. The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see Table 4 for a definition of these variables). Standard errors (given in parentheses) are heteroscedasticity robust, clustered at the borrowing firm. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Public	-42.078***	-42.401***	-34.414***	-43.595***	-43.627***	-36.568**
	(7.683)	(9.121)	(9.403)	(7.883)	(9.299)	(9.463)
Sales Growth $_{t+1}$	0.0001			-0.004		
	(0.001)			(0.003)		
Sales Growth $_{t+2}$		0.0001			-0.001	
		(0.001)			(0.001)	
Sales Growth $_{t+3}$			-.00002			-0.005*
			(0.001)			(0.003)
Public x Sales Growth $_{t+1}$				0.005		
				(0.003)		
Public x Sales Growth $_{t+2}$					0.001	
					(0.001)	
Public x Sales Growth $_{t+3}$						0.006*
						(0.003)
Borrower Characteristics	YES	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Diagnostics						
N	928	722	533	928	722	533
R^2	0.626	0.627	0.6	0.627	0.627	0.598

Table 12

Mechanisms of Loan Spread Differences

This table reports results from tests assessing the relative importance of each of the proposed mechanisms. Column (1) repeats model (7) from Table 8 (which show the relative importance of bond market access versus lending relationships at explaining the loan cost difference of public versus private firm loans) and we consecutively add the other 4 mechanisms that we study throughout the paper. Column (2) adds an indicator variable for being listed on the FTSE100 or FTSE250. Column (3) adds insider ownership, column (4) adds private equity, column (5) adds liquidity and column (6) adds sales growth rates (3 years after loan origination). The dependent variable is the All-In-Spread-Drawn (AISD). This table only reports the coefficient estimates for the main explanatory variables. The regressions further include all other control variables used in the previous analyses: borrower credit risk, loan contract terms, loan purpose control variables as well as time and industry dummies (see the Appendix for a definition of these variables). Standard errors (given in parentheses) are heteroscedasticity robust, clustered at the borrowing firm. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Public	-34.213***	-24.961***	-25.927***	-20.769**	-22.681**	-22.592**
	(5.215)	(5.854)	(6.006)	(9.133)	(11.102)	(11.137)
(1) Bonds	-45.736***	-47.530***	-47.949***	-66.073***	-62.991***	-64.040***
	(8.398)	(8.684)	(8.703)	(14.468)	(13.054)	(12.823)
(2) Public x Bonds	46.453***	50.006***	50.789***	66.569***	65.153***	65.608***
	(9.050)	(9.496)	(9.566)	(15.691)	(14.387)	(14.226)
(3) Rel(Dummy)		23.197***	23.475***	21.308**	30.117***	29.946***
		(6.399)	(6.399)	(9.166)	(9.216)	(9.157)
(4) Public x Rel(Dummy)		-27.792***	-27.874***	-23.744**	-36.475***	-36.121***
		(7.925)	(7.924)	(10.783)	(10.691)	(10.598)
Small Cap/AIM			10.030	23.561**	27.090**	28.032**
			(8.977)	(11.312)	(11.103)	(11.155)
Log(Owners)				-8.155	-2.849	-2.940
				(1.987)	(2.136)	(2.130)
Private Equity					59.659***	55.109***
					(9.423)	(9.869)
Public x Private Equity					19.356	21.879
					(15.532)	(15.556)
Traded						25.768**
						(12.746)
Public x Not Traded						-9.515
						(15.052)
Borrower Characteristics	YES	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES
Diagnostics						
Wald-Test: (1)=|(2)| [p-value]	0.901	0.668	0.623	0.942	0.738	0.806
Wald-Test: (3)=|(4)| [p-value]		0.358	0.38	0.693	0.283	0.295
N	1,746	1,746	1,746	1,053	1,053	1,053
R^2	0.609	0.613	0.613	0.62	0.641	0.645

Appendix I

Variable Definition

Dependent Variable	
AISD	Is the all-in-spread-drawn, which is the spread plus annualized upfront fees above LIBOR.
Instrument	
log(1+distance)	Natural logarithm of 1 plus the distance from the firm's headquarter to London.
Inference Variables	
Public	Dummy equal to one if the firm is public.
Bonds	Dummy equal to one if firm has issued public bond in the past.
Last Bond Public	Dummy equal to one if the last bond issued was a public bond.
Log(1+Prior Bonds)	Natural logarithm of 1 plus the number of public bonds issued before the loan origination date.
No Bonds	Dummy equal to one if the firm has not issued a public bond in the past.
FTSE100 / FTSE250	Dummy variable equal to one if firm is traded as part of these two indices.
Small Cap / AIM	Dummy variable equal to one if firm is traded as part of these two indices.
Rel(Dummy)	Dummy variable equal to one if current lead arranger has been lead arranger of a loan to the same firm in the 5 years prior to the current loan.
Rel(Number)	Ratio of the number of loans extended by the lead arranger to the same borrower as a percentage of the total number of loans this borrower received in the 5 past years prior to the current loan.
Rel(Amount)	Ratio of the $ amount of loans extended by the lead arranger to the same borrower as a percentage of the total $ amount of loans this borrower received in the 5 past years prior to the current loan.
Log(Owners)	Natural logarithm of the number of reported shareholders.
HHI(Low)	We calculate the Herfindahl-Hirschman-Index (HHI) with the percentage ownership share of each reported shareholder. HHI(Low) is a dummy variable equal to one if ownership concentration is low, i.e. below 0.67
HHI(High)	Dummy variable equal to one if ownership concentration is high, i.e. above 0.67.
PtP	Dummy equal to one if deal is a public-to-private transaction.
LBO/MBO	Dummy equal to one if deal is a LBO or MBO (but not a PtP)
Private Equity (No Buyout)	Dummy equal to one if deal involves a private equity sponsor but is not a buyout
Private Equity	Dummy equal to one if deal involves a private equity sponsor.
Traded	Dummy equal to one if loan has been traded on the secondary market after Origination
Sales Growtht+i	Sales growth rate of firm i years after loan origination ($i \in [1, 2, 3]$)
Log(1+distancebranch)	Natural logarithm of 1 plus the distance between the firm and the closest branch of the lead arranger
Small	Dummy equal to one if turnover of firm is in the first quartile.
Medium	Dummy equal to one if turnover of firm is between the 25% and 75% quartile.
Large	Dummy equal to one if turnover of firm is in the fourth quartile.

Appendix I (Cont'd)

Control Variables	
Borrower Characteristics	
Profitability	Ratio of EBITDA to Sales
Growth	Sales growth (Salest/Salest t-1)
Leverage	Ratio of long term debt over total assets.
Log(Cash)	The natural logarithm of cash & equivalents.
Log(Assets)	The natural logarithm of total assets.
Log(Age)	The natural logarithm of one plus the age of the company measured in months.
Tangible	Ratio of tangible fixed assets over total assets.
Log(1+Interest Coverage)	Measured as the natural logarithm of one plus EBITDA / interest paid.
Investment Grade	Dummy variable equal to one if the borrower is investment grade rated.
Not Rated	Dummy variable equal to one if the borrower is not rated.
Loan Characteristics	
Term Loan	Dummy variable equal to one if loan is term loan.
Log(1+Maturity)	Measured as the natural logarithm of one plus loan maturity (measured in months)
Log(Loan Size)	Measured as the natural logarithm of one plus the loan facility amount.
Covenants	Dummy variable equal to one if loan contract specifies covenants.
Secured	Dummy variable equal to one if loan is secured with collateral.
Secured Missing	Dummy variable equal to one if loan secured status is missing.
Refinancing	Dummy variable equal to one if loan is refinancing loan.
Loan Purpose	Separate dummy variables for corporate structure, capital structure, acquisition and project finance purposes.

Appendix II

Exclusion Restriction

The table reports coefficient estimates from OLS regressions. Only loans in which either Royal Bank of Scotland (RBS) or Barclays are among the lead role banks. The dependent variable is the AISD measured as the spread above LIBOR. Public is a dummy variable measuring whether the firm is stock exchange listed. Column (1) adds Log(1+distance$_{branch}$) which is the natural logarithm of 1 plus the distance between the firm's headquarter and the closest branch of the lead bank. Column (2) adds the interaction term with Public. In column (3), we introduce 4 dummy variables Size1, Size2, Size3 and Size4 which are equal to 1 if the firm's turnover is in the 0% - 25% quartile, the 25% - 50% quartile, the 50% - 75% quartile or the 75% - 100% quartile, respectively, and interact them with our firm-branch distance measure. Column (4) explores the effect of firm-branch distance in deals without private equity participation. Column (5) adds Barclays a binary variable equal to 1 if Barclays is among the lead arrangers (RBS is omitted). All regressions further include all variables described in Table 4 in this paper, i.e. borrower characteristics, loan characteristics and loan purpose controls: acquisition, corporate purposes, capital structure related purposes, project finance related purposes and other (which are omitted), as well as time and industry fixed effects. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level. ***, **, and * denote significance at the1%, 5%, and 10% level, respectively.

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Public	-40.265***	-48.937***	-39.112***	-19.603**	-38.025***
	(10.219)	(14.660)	(10.143)	(9.897)	(11.626)
Log(1+distance$_{branch}$)	-2.512	-4.490		-5.448	
	(3.867)	(5.401)		(3.708)	
Public x Log(1+distance$_{branch}$)		5.255			
		(7.141)			
Log(1+distance$_{branch}$) x Size1			-7.101		
			(5.209)		
Log(1+distance$_{branch}$) x Size2			2.751		
			(6.032)		
Log(1+distance$_{branch}$) x Size3			4.201		
			(4.819)		
Private Equity				74.093***	
				(16.914)	
Private Equity x Log(1+distance$_{branch}$)				2.638	
				(6.975)	
Barclays					1.676
					(12.917)
Public x Barclays					-6.397
					(15.344)
Borrower Characteristics	YES	YES	YES	YES	YES
Loan Characteristics	YES	YES	YES	YES	YES
Loan Purpose Control	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES
Diagnostics					
Number Obs.	694	694	694	694	694
R^2	0.572	0.572	0.575	0.599	0.572

Figure 1

Loan Spreads as a Function of Propensity Scores Using Local Linear Matching

Loan Spreads as a Function of Propensity Scores Using Local Linear Matching. Figure 1 is constructed as follows: We estimate the propensity score as explained in section 4.1. and match each loan to a public firm with all private firm loans using local linear matching, i.e. the difference between the propensity score of the public firm loan and each private firm loan is used as a weight to calculate an average spread for the private firm loans. We then sort the matched public and private firm loans by propensity score and plot loan spreads for both. We also construct this match using nearest neighbor matching and obtain a similar picture.