The Costs of Being Private: Evidence from the Loan Market *

Anthony Saunders † Sascha Steffen ‡

Abstract

In this paper, we seek to evaluate the relative costs of debt for private versus comparable publicly traded firms. US studies of this important question have been limited due to the absence of comprehensive financial data on privately-held firms. However, such data is available in the UK. Consequently, we employ a unique dataset of loans taken out by both types of UK firms with a large array of loan and borrower characteristics. We use propensity scores to match private and public companies and find that private firms pay, on average, 29 to 42bps higher loan spreads than comparable public firms. These findings are shown to be highly robust across size, opaqueness, relationships, firm age, ownership structure and, importantly, alternative tests that control for endogeneity. Consequently, it appears that being private results in debt costs that are significantly higher for private firms than public firms and may mitigate some the previously identified benefits of going private.

JEL-Classification: G21, G22

Keywords: Banks, Syndicated loans, Costs of being private

*We thank Viral Acharya, Ashwini Agrarwal, Linda Allen, Yakov Amihud, Sreedhar Bharath, Anurag Gupta, Victoria Ivashina, Alexander Ljungqvist, Holger Mueller, Lars Norden, Steven Ongena, Joerg Rocholl, Joao Santos, Philipp Schnabl, Phil Strahan (discussant), Greg Udell (discussant) and participants in the 45th Bank Structure and Competition Conference (Chicago, 2009) and the Financial Intermediation Research Society (FIRS, Prague 2009) for helpful comments and discussions.

†Stern School of Business, New York University, New York, NY 10012. Tel: (212) 998 0711, Email: asaunder@stern.nyu.edu

‡University of Mannheim, 68131 Mannheim. Tel: +49(69) 621 181 1531, Email: steffen@bank.bwl.uni-mannheim.de

1. Introduction

Do privately held firms face higher borrowing costs in loan markets than publicly held firms? Answers to this question have been very limited so far, which is surprising given that a significant proportion of loans in the syndicated loan market have been allocated to private borrowers. For example, in the US, 50.5% of all syndicated loans originated between 1987 and 2007 were allocated to private firms. This lack of academic research can be attributed, in part, to the fact that there are no requirements for privately-held firms in the US to publicly disclose their borrowing activities and therefore data on private firms' debt funding costs are not readily available. As a consequence, researchers have largely focused on topics relating to borrowing costs using data for large, publicly held companies. However, ignoring such an important segment of the economy as represented by private firms leaves several questions unanswered. Do private firms face higher borrowing costs than public firms? If so, how big is this disadvantage and which firms are affected the most? And, is there a role for bank relationships in mitigating this loan cost disadvantage for private firms in a similar manner to that documented for public firms?

We address these questions by explicitly investigating whether it is more costly to be a privately held firm than a publicly held firm in the syndicated loan market. Given the absence of financial data on US private firms, our approach is to evaluate the borrowing costs for private relative to comparable public firms using a unique dataset of syndicated loans taken out by both types of companies in the United Kingdom (UK) over the 1987 to 2007 period. Such an investigation is feasible since the enactment of the Companies Act in 1964 required all limited liability (private and public) companies to be registered with UK Companies House's corporate registry and to disclose their financial statement information on an annual basis.[1] Our sample, therefore, provides an ideal laboratory in which to study the financing costs of being private.

Overall, this paper makes four contributions. First, we examine the extent to which loan costs are related to whether a firms is public or private. Second, we provide evidence on whether informational frictions and lending relationships influence loan costs for private firms in a similar fashion to public firms. Third, we provide insights into a private firms borrowing costs, a sector that has largely been ignored in the literature but plays an important role in loan markets and the economy in general.[2] Finally, our paper also provides some potential

[1] All of the borrowers in our sample are limited liability companies. We give a detailed description of this legislation in the appendix.

[2] Over 95% of firms in the UK are privately owned and are responsible for more than half of the UK

insights into the relative borrowing costs of being private in the US, since there is considerable overlap between the UK and US financial systems and corporate governance structures (see e.g. Archarya, John, and Sundaram (2006) and Allen, Carletti, and Marquez (2006)).

The existing literature on: "Why do firms go private?" has largely ignored the borrowing costs of being private. For example, DeAngelo, DeAngelo, and Rice (1984b) and DeAngelo, DeAngelo, and Rice (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), Kaplan (1989b) Kaplan (1991) analyze leverage buyouts and find that incentive improvements and tax effects associated with high leverage are driving the benefits of going private. None of these papers, however, addresses the cost of debt associated with being a private company. There is also a voluminous literature on "Why do firms go public?" [3] This literature often stays away from analyzing the debt cost motivation as to why firms go public, again largely due to data availability.[4]

The preceding discussion suggests that the decision as whether to be a public or private firm is endogenous which poses specific challenges to our analysis. The empirical design in this paper addresses the self-selection concern that the endogeneity of the corporate structure decision (i.e. being public rathern than private) may lead to inconsistent estimates of the relative debt costs of being private rather than public. To overcome this concern, we use initially propensity score matching of private to public firms in order to quantify the loan cost effect of being a private firm. This method assumes that the decision whether to be public or private can be explained by "observable" characteristics. Our dataset is well suited to meet this requirement, as we are able to match loans to public and privately-held firms over a large array of loan and borrower characteristics. Using different matching techniques (nearest neighbor matching and local linear regression) we construct a matched sample of private firms with observations that have similar propensity scores as matched public firms. The difference in spreads between these matched firm loans is an estimate of the borrowing cost of being private. The difference in spreads is shown to range from 29bps to 49bps based on the matching method used.

Propensity score estimators are inconsistent estimators of the loan cost disadvantage of

GDP. Similarly, the US Small Business Administration reports that in 1998 businesses with fewer than 500 employees accounted for more than half of US GDP

[3] See Ljungqvist and Jenkinson (2001) and Ritter (2003) for surveys.

[4] Exceptions in the literature are Boehmer and Ljungqvist (2004), Helwege and Packer (2004) and Chemmanur, He, and Nandi (2007).

being private if there are "unobservables" which affect the assignment into being a public or private firm. For example, private and public firms may differ in terms of future credit quality or future growth prospects in a way not captured by our observable characteristics. If, based on these unobservables, private firms are riskier than public firms, lenders might demand higher spreads. To examine this, we employ three proxies to measure the ex-post performance of public and private sample borrowers after loan origination: (i) ex-post changes in Z-Score and rating downgrade probability, (ii) ex-post changes in sales growth and (iii) ex-post performance of loans traded in the secondary loan market. Overall, we do not find evidence that public firms perform significantly differently relative to privately-held firms after loan origination.

We next analyze whether the loan cost disadvantage of being private is particularly pronounced in high information asymmetry environments. Prior research documents the importance of informational transparency in explaining loan spreads (Santos and Winton (2008), Bharath, Dahiya, Saunders, and Srinivasan (2008) and Schenone (2008))). We find supporting evidence for this hypothesis. For example, if private firms have a high propensity to be public, they are also more likely to pay similar loan spreads as public firms. Our data further allows us to estimate the costs of being private at different levels of informational opacity stratifying our matched sample. For example, we find that loan spreads for private firms decrease from the smallest to the largest firms by a greater amount than for public firms. Moreover, public firms benefit more relative to private firms when they are young. For older public firms, relative loan cost benefits are quite small and in some specifications, the spread difference between large public and privately-held firms is insignificant.

There is a large literature in banking that argues that relationships are important and generate private information to banks about the clients (see for example, Fama (1985)). A testable hypotheses is whether relationships help to mitigate the loan cost disadvantage of being private. We investigate whether both private and public firms benefit from lending relationships and, if so, whether public and private firms benefit equally from having such relationships. We address these questions by stratifying our matched sample along two dimensions: informational opacity and bank-borrower lending relationships, and estimate the impact of relationships on public and private firm loan spreads. We find that both types of firms benefit from relationships by paying lower spreads to relationship lenders. However, public firms receive larger relationship benefits than comparable private firms.[5]

[5] Our paper is also related to the burgeoning literature on syndicated loans which generally have the role of information asymmetry at the heart of the questions they are asking: Why do banks syndicate loans? (Simons (1993), Dennis and Mullineaux (2000)) How does information asymmetry influence syndicated loan

We employ three different measures of information opacity to measure loan cost differences between private and public borrowers. More specifically, we use: (i) stock exchange affiliation, (ii) analyst coverage, and (iii) listing among the Fortune 500 firms, as proxies for information opacity. Taken together, our results confirm that information opacity (and in particular information opacity associated with the corporate status of being private) is of first order importance in explaining the costs of private debt.

An alternative explanation for our results is related to the differences in ownership structure between public and private firms. The latter usually having a higher concentration of insider ownership which can lead to agency related incentives. For example, the literature discusses enhanced risk taking incentives if managerial and shareholder interests become increasingly aligned (Amihud and Lev (1981) and Wright, Ferris, Sarin, and Awasthi (1996)) which suggests higher loan spreads would be established for private firms. Our results show that, despite the distinctive influence of insider ownership on loan spreads, private firms still pay significantly higher spreads after controlling for this effect. An additional issue could be the influence of private equity ownership on loan spreads. Corporate loans are the 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 transactions, LBO/MBO's, acquisitions and recapitalizations) and identify significantly higher loan costs associated with these deals. Nevertheless, our results still confirm that private firms face higher loan costs even without private equity participation.

While the secondary loan market in the UK is small compared to the US, loan trading has substantially increased since 2003. If banks trade loans in order to diversify their loan portfolios, loan spreads might be higher for private firms if their loans are less liquid. However, we find that the percentage of loans that are traded is higher for our subsample of private firms than public firms. Further, even after controlling for the effect of loan liquidity on loan spreads, we still find significantly higher spreads on loans to private firms.

The structure of the remainder of this paper is as follows: Section 2 sets out our methodology. Section 3 describes our dataset and provides some descriptive statistics. In section 4, we discuss univariate tests and OLS regression results as to the loan spread difference between private and public firms. Section 5 reports the results from the matching procedure

structures? (Lee and Mullineaux (2004), Jones, Lang, and Nigro (2005), Sufi (2007)) How are syndicated loans priced? (Bharath, Dahiya, Saunders, and Srinivasan (2007), Bharath, Dahiya, Saunders, and Srinivasan (2008), Ivashina (2007), Santos and Winton (2008)) And, what is the pattern of interest rates before and after a firm's IPO? (Schenone (2008))

that corrects for endogeneity in comparing the cost of loans for public versus private firms. Section 6 discusses our results with respect to various information opacity proxies and shows their robustness vis-a-vis alternative explanations. Section 7 concludes.

2. Methodology

Our approach to assessing the debt cost of being private is to answer the following question: Do public firms, ceteris paribus, pay less for their loans than comparable private companies? In answering this question we recognize a potential selection bias since a firm's decision to be public or private is unlikely to be exogenous, but rather be related to observable characteristics such as firm size or age. Accordingly, following Rosenbaum and Rubin (1983) we use propensity score matching as a way to reduce selection bias. Such matching allows a comparison of outcomes to be performed using treatment and control groups which are as similar as possible.[6]

We identify two groups: public firms (the treatment group, denoted $T_i = 1$ for firm i) and private firms (the control group, denoted $T_i = 0$). The treatment group is matched with the control group on the basis of its propensity score:

$$P(x_i) = Prob(T_i = 1|x_i), \text{with}(0 < P(x_i) < 1)$$

The propensity score matching method uses $P(x_i)$ or a linear function of the propensity score, to select controls for each firm in the treatment group.

There are several advantages of propensity score matching methods over conventional regression methods (e.g. multivariate regression models) used in the literature. First while commonly OLS utilizes the full sample for estimation purposes, propensity score matching confines estimation to the matched sub-samples. Using only matched observations reduces the estimation bias vis-a-vis unmatched samples and estimators are generally more robust to model misspecifications (Conniffe, Gash, and O'Connell (2000), Rubin and Thomas (2000)). This is particularly important in our setting where there is an elevation at the boundaries of the propensity score which, in turn, makes it harder to find good matched samples. Second, the matching method does not impose any specific functional form as to the relationship

[6] The more recent banking and corporate finance literature uses propensity score matching to correct for self selection bias. Bharath, Dahiya, Saunders, and Srinivasan (2008) use propensity score matching to identify the impact of lending relationships on loan spreads and Drucker and Puri (2005) assess the impact of bundling of investment banking and commercial banking services on loan spreads. Michaely and Roberts (2007) apply propensity score matching to a large set of UK companies. They study dividend policies in public and private firms.

between outcome and control variables. Third, in OLS regression, one usually looks for variables determining the outcome which are also exogenous, by contrast, in propensity score matching, one looks for two sets of control variables, the predictors of participation and predictors of outcome. Rubin and Thomas (2000) have also shown in simulations that variables which are weak predictors of outcome reduce the bias in estimating causal effects using propensity score matching. Consequently, we follow a three step procedure in section 4. First, we identify the determinants of participation and outcome. Second, we estimate the propensity score and third, we estimate the effect of being public rather than private on the cost of loans. We employ Nearest Neigborhood estimation and Local Linear Regression (LLR) as matching methods as described in Heckman, Ichimura, and Todd (1997), Heckman, Ichimura, and Todd (1998) and Fan (1992). We explain these methods as we proceed. Overall, there are merits in using propensity scores over OLS to estimate the loan cost disadvantage of being private.

3. Data and sample selection

To gain insights into the loan spread benefits of being a public rather than a private company, we construct a unique dataset using three data sources, namely, the Loan Pricing Corporation Dealscan (henceforth, LPC) database, Bureau van Djik's (BvD) Amadeus (Amadeus) database, and 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 on 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). [7] However, Dealscan provides sales data only for US 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 Companies House.[8] Jordans, a UK based information provider, collects data from Companies House and

[7] LPC is commonly used in the literature on syndicated loans and lending relationships (see e.g. Bharath, Dahiya, Saunders, and Srinivasan (2007), Drucker and Puri (2005) and the references cited therein). A good description of LPC is provided in Strahan (1999).

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

BvD, in turn, collects the data from Jordans.[9] There is no common identifier in LPC and Amadeus to UK firms and, hence, 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.[10] To deal with name changes (e.g. from mergers and acquisitions), we look at each company individually. We then construct a chronology of name changes using different sources, namely, the WebCheck-Service on the website of UK Companies House[11], Bloomberg's corporate action calender, and Hoover's corporate histories database.

Amadeus provides two type 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 calender, and Hoover's corporate histories database. We supplemented information for private companies using financial statements directly obtained from UK Companies House. We always use accounting information from the fiscal year ending in calender year *t-1* for loans made in calender year *t*.[12]

[Table 1]

Table 1 provides descriptive statistics for our data. Panel A shows the calender time distribution of loans for public versus privately-held firms. Similar to the distribution of loans in the US, 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, which 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 shows the calender time distibution of loan amounts with the average loan amount in each year being

[9] See Brav (2005) for a detailed description about this process.

[10] Unfortunately, there is no unique identifier which tracks companies through name changes, mergers, etc..

[11] The WebCheck service is available under http://wck2.companieshouse.gov.uk

[12] We use the European version of the Compustat Global database as a second source of (public) company financial information for two reasons: first, there is some information in one source that does not exist in the other (although the two sources have a large overlap for public companies). Second, Amadeus provides information only for the last ten years. To use the loans from LPC (which starts in 1987) to the best possible extent, we supplement information from Amadeus with information from Compustat. We make sure that we can reconcile data items between Amadeus and Compustat, and conservatively do not update the data, whenever there are any doubts. Further, we are very careful in this procedure as Compustat provides information in the original currency and we convert all financial information to US Dollars using the exchange rate given in Amadeus for each year.

significantly higher for the public sample borrowers. Panel C of Table 1 shows the industry classification of borrowers using the 1-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 C illustrates loan contracts according to their primary purpose as recorded in LPC with acquisition related purposes being the most frequently reported purpose.

[Table 2]

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

4. The Costs of Being Private

4.1. 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.

[Table 3]

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: loan amount (in million US-Dollars), maturity of the loan (in months), collateral (the percentage of secured loans), term loan, and 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. Comparing the average AISD for public versus private firms, we find that, on average, the AISD is 160bps lower for public firms compared to private firms. This difference is significant at the one percent level. Loan amounts to public firms are, on

average, $ 400 million larger and loans to public borrowers are less likely to be secured. Each of these results is significant at the one percent level and the magnitudes of the differences are economically meaningful.

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 shows 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% versus 34%), more cash ($412 million versus $67 million) and are older (34 years versus 23 years). These differences are statistically significant at the one percent level.[13]

The mean long-term debt to assets ratio and the mean interest coverage ratio are higher for private firms.[14] On average, private and public firms are equally profitable, with the difference in EBITDA to sales ratios insignificantly different from zero.[15]

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 differences between public and private borrowers that may very well offer explanations of this pricing difference over and above corporate organizational form.

4.2. 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:

$$AISD = PUBLIC + \sum \beta_i(BorrowerCharacteristics) + \sum \beta_j(LoanCharacteristics) + \sum \beta_k(Controls) \quad (4..1)$$

- AISD: Is the all-in-spread-drawn, which is the spread plus annualized upfront fees

[13] Tests for difference in medians provides qualitatively similar results.

[14] The differences in medians is not statistically significant with regard to leverage, and only weakly significant with regard to interest coverage.

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

above LIBOR

- *Borrower Characteristic*: Various characteristics of the borrower as described below:
  - PUBLIC: Firm dummy equal to one if the firm is public.
  - LOG(1+COVERAGE): Measured as the natural logarithm of one plus EBITDA / interest paid.
  - LEVERAGE: Ratio of long term debt over total assets.
  - TANGIBILITY: Ratio of tangible fixed assets over total assets.
  - NOT RATED: Dummy variable equal to one if the borrower is not rated.
  - INVESTMENT GRADE: Dummy variable equal to one if the borrower is investment grade rated.
  - BOND: Dummy variable equal to one if the borrower has issued a public bond within the last 5 years prior to the loan.
  - RELATIONSHIP: Dummy variable equal to one if the borrower has a lending relationship with the arranger within the last 5 years prior to the loan.
  - PROFITABILITY: Ratio of EBITDA to SALES
  - GROWTH: Sales growth ($\text{SALES}_t/\text{SALES}_{t-1}$)
  - LOG(CASH): An approximation of cash using the income statement (measured as net income plus depreciation)[16].
  - LOG(ASSETS): The natural logarithm of total assets.
  - LOG(1+AGE): The natural logarithm of one plus the age of the company measured in months.
- *Loan Characteristics*: Various loan contract terms as defined below:
  - LOG(LOAN SIZE): Measured as the natural logarithm of one plus the loan facility amount.
  - LOG(1+MATURITY): Measured as the natural logarithm of one plus loan maturity (which is measured in months)
  - TERM LOAN:Dummy variable equal to one if loan is term loan.
  - REFINANCING:Dummy variable equal to one if loan is refinancing loan.
  - 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 (ommitted group are unsecured loans).
  - COVENANTS: Dummy variable equal to one if loan contract specifies covenants.

[16] We get similar results using "Cash & Equivalents" from the balance sheet

- *Controls*: Other control variables include loan purpose controls, and loan type dummy variables.

The results of this regression are reported in Table 4. The model shows coefficent estimates for the loan cost advantage of public firms using a pooled OLS regression. To control for heteroscedasticity and autocorrelation, we cluster standard errors at the borrowing firm level (Petersen (2008)).

[Table 4]

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 one percent level and shows that public firms pay 35bps less for loans than private companies, controlling for other variables. Given our univariate results, that show a 160bps loan spread difference between private and public borrowers, these results suggest that 22% 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 USD 237 million, 35bps translates into an annual cost saving of USD 0.83 million or 1.6% of private firms' profits, which is USD 52 million on average.

Our results further show that less profitable, high growth firms, borrowers with a smaller proportion of tangible assets and non-investment grade borrowers pay higher loan spreads. LOG(1+MATURITY) is also positively associated with loan spreads and is significant at the one percent level.

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

4.3. Endogeneity and Propensity Score Matching

In order to reduce selection bias in estimating the causal effects of being public versus private, we estimate a probit model including variables determining the outcome as well as variables determining participation. 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.[17]

We estimate a probit model of the following form,[18]

$$Public = \beta_0 + \sum \beta_i(BorrowerCharacteristics) + \sum \beta_j(LoanCharacteristics) \sum \beta_k(Controls)$$

where PUBLIC is a dummy variable equal to either 0 or 1.

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. For example, a propensity score of 0.3 means that this firm, given its observable characteristics, has an (estimated) probability of being public of 30%, where the propensity score is bounded between 0 and 1. In order to match private and public companies based on their propensity scores, there needs to be a sufficient overlap in the propensity scores for each type of borrower. Accordingly, we impose a common support condition, i.e. we do not match public firms whose propensity score is larger than the largest propensity score among private firms, and we do not match private firms whose propensity score is smaller than the smallest score among public firms. This has an important implication, namely, the more the propensity scores for private and public companies are concentrated at the extreme boundaries (that is, 0 and 1), the less likely it is we will find sufficiently good matches and the more observations will be dropped from our sample.

[Table 5]

Table 5 reports estimates of the probit regression. Note that the coefficients show similar magnitudes as those in Brav (2005) and are in line with theoretical predictions in the prior literature.[19] Larger and older firms, high growth firms as well as firms that are profitable are more likely to be public.

[17] The variables which most likely determine participation are PROFITABLITY, GROWTH, LOG(CASH), LOG(ASSETS), LOG(1+AGE) and year and two digit SIC Codes.

[18] The borrower and loan characteristics are defined in the previous section.

[19] Brav (2005) uses the lagged legal status of the firm as determinant of a firm's legal status today. In unreported regressions, we replicate his specification and find that the lagged legal status explains a large proportion of the variation of being public or not. However, we exclude this variable from our specification for two reasons: First, there is only little variation in this variable in the sense that the dummy is zero for all private firms and almost exclusively one for all public because there is minimal switching from private to public in our dataset. That is, the variable has huge power in explaining today's legal status and, consequently, pushes the propensity score towards the boundaries (0 and 1). This reduces the range of comparable propensity scores of public and private firms. Second, and more importantly, it is not clear that it jointly effects the decision to be public and the loan spread, which is an important selection criterium for determinants used in estimating the propensity score. Third, and related to the second argument, our goal

[Figure 1]

As explained above, we estimate the propensity score by imposing a common support restriction on the selection of the sample of private and public firms. As a result, we find 735 loans taken out by public firms and match them to 952 loans taken out by private firms. The average propensity score of public firms is 0.7198, the average propensity score for private firms is 0.2116, which suggests that propensity scores are asymmetrically distributed among public and private firms. Figure 1 shows the distribution of public and private firm propensity scores. The graph shows an elevated concentration of the propensity scores at the boundaries, but also a sufficient overlap between private and public companies in-between.

In order to obtain robust results from our analysis, we use two different matching methodologies to evaluate the cost of being private: nearest neighbor and local linear matching which we discuss in section 4.4 below.

4.4. Matching Results

i. Nearest Neighbor Matching

The first class of matching estimators we use is nearest neighbor matching. For each loan to a public firm, the 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"). The literature proposes several variants of this matching procedure, e.g. matching "with replacement" and "without replacement" and "oversampling", i.e. using more than one nearest neighbor.

In the case of the nearest neighbor matching with replacement, the loan to a private firm can be used more than once as a match. If the matching is done without replacement, each loan can only be considered once. If we allow for replacement, the quality of the match will increase, particularly, if the propensity score distribution is different between the matched groups as was shown in Figure 1. Intuitively, if we do not replace the matched private loans, it is likely to be the case that we may match relatively high score loans to public firms with low score loans to private firms. This would be a weak match and matching with replacement mitigates this problem.[20]

A second variant of nearest neighbor matching is to increase the number of neighbors used in the matching procedure. This is advantageous because more information is used to

is not to identify the best possible model to explain self-selection into being public, but that loan spreads are independent of the treatment assignment given the propensity score.

[20]However, as Smith and Todd (2005) note, matching with replacement increases the variance of the estimated effect because this procedure reduces the number of distinct loans to private firms used to construct the match.

construct the match. Additionally, if there are many loans to private firms with propensity scores comparable to the loan to the public firm ("comparison units"), it does not reduce the quality of the match.

In the following analysis we do both, i.e. we use matching with replacement to account for the characteristics of the propensity score distribution in our sample. Further, we use 50 and 100 neighbors to match loans to both types of firms.[21]

[Table 6]

The results are tabulated in Table 6. We always report the cost savings of a public firm (the coefficient of PUBLIC) whose absolute values correspond to the relative spread cost of being private. Panel A repeats the results from the OLS regressions reported in Table 4 in order to be able to compare the results obtained using the unmatched (OLS) and matched (propensity score) approach.

Panel B reports coefficient estimates from PUBLIC using nearest neighbor (NN) matching with 50 (100) neighbors. For each method, we report results without bootstrapped standard errors as well as using bootstrapped standard errors with 50 (100, 300) replications.

The results show significant loan cost savings for public companies: matching with 50 (100) nearest neighbors suggests that public firms save 32bps (49bps) compared to private firms. As a higher number of neighbors calculates the average loan spread of the matched group of private firms over a broader range of propensity scores, our results suggest that the difference in loan spreads between private and public companies depends on the propensity of being public. This is interesting as it brings up the question as to whether the cost of being private is smaller when propensity scores are high or low, i.e. when firms have a higher or lower propensity of being public. Intuitively, we expect the spread difference to be smaller when propensity scores are high because private companies with high propensity scores are supposed to be more transparent relative to private companies with low propensity scores.[22] We test this hypothesis in section 4.

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 a large number of propensity scores are at the boundary.

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

[22] The probit model shown in Table 5 suggests, for example, that large and older companies are more likely to be public. Firm size and age are two measures of information asymmetry commonly used in the literature.

ii. Local Linear Matching

In the previous section, we used a matching procedure where the number of loans to private firms that are used to construct the match was limited by the number of nearest neighbors we imposed on the matching process (50 or 100). Here, we use the local linear estimator that uses 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 firm receiving the highest weight. The larger this distance between the public and private firm scores, the lower the weight. However, using all observations also implies that weak matches (with a large distance between the propensity scores) are also incorporated in the calculation of the loan cost difference. Therefore, it is essential to impose the same common (support) restriction as explained above, regarding propensity score overlap. We use the local linear estimator as proposed in Heckman, Ichimura, and Todd (1997) with a Gaussian kernel.

The results are tabulated in Panel C of Table 6 (we report standard errors without bootstrapping as well as standard errors obtained by bootstrapping with 50 (100,300) replications). Local linear matching shows that public firms pay 29bps lower spread than private firms and the difference is highly significant. This confirms our earlier result that loan spreads are higher for private than for public firms. Nevertheless, the magnitude of this estimate is lower than the estimate obtained using the nearest neighbor matching. Therefore, 29bps and 49bps constitute a lower and upper bound of the loan cost of being private using propensity score matched samples.

4.5. Ex-Post Performance of Private versus Public Firms

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 future borrower credit quality or future growth prospects which are not captured by observable characteristics. In other words, propensity score matching might not alleviate the endogeneity concerns associated with being public or private. To examine this, we analyse the performance of private versus public firms in our sample after loan origination. If private firms are riskier than public firms, we expect to find that public firms will, ceteris paribus, perform better ex-post. We use three approaches to measure the ex-post performance of private and public firms: (i) ex-post changes in Z-Score and rating downgrade probability,

(ii) ex-post changes in sales growth and (iii) ex-post performance of the traded loans in the secondary loan market.

4.5.1. Ex-post changes in Z-Score and rating downgrade probability

To the extent that the relevant unobserved characteristics are related to borrower credit quality, we use changes in the Altman's Z-Score as proxy for ex-post performance. We choose the year of loan origination as the starting point and track the performance for the next 1, 2 and 3 years, respectively. The Z-Score is an index that measures the credit quality of firms based on accounting ratios. The original Z-Score includes market based measures which are not available for private firms. We therfore use a modified version of the Z-Score (Z') that uses book values of financial statement items and apply Z' to both public and private firms.

[Table 7]

Table 7 shows how Z' is calculated and Panel A of Table 7 reports the regression results relating changes in Z' to PUBLIC and other borrower and loan control variables. The accounting data extend to the end of 2007. The latest origination date in our sample is also end of 2007. To address right-censoring concerns, we use loans with the latest origination date end of 2006, 2005, and 2004 when measuring the performance for t+1, t+2 and t+3, respectively. However, not restricting our sample gives similar results. We lose observations restricting our dataset and whenever all variables required for calculating Z' are not simultaneously available. We include all control variables from Table 4 and allow for clustering of standard errors at the firm level. The coefficient of PUBLIC is never significant, i.e. we do not find evidence that borrower credit quality changes significantly differently for public relative to private companies over a 1, 2 or 3 year horizon after loan origination.

Actual default rates and rating downgrade probabilities are alternative measures of ex-post borrower performance. If public firms are of higher quality, we expect to find lower default rates and a lower probability of experiencing rating downgrades after loan origination. We obtain rating data from S&P for the 1987 to 2008 period. 327 loans in our sample were issued by rated firms, involving 89 different companies. We observe rating changes over a 1 to 3 year period after loan origination. A borrower is considered to default if a company's credit rating is set to "D". A rating downgrade is defined as a borrower's credit rating dropping by one letter grade, for example, from AA to A. Default events are rare events: Out of these 89 companies, only 4 defaulted by the end of 2008, including 3 public firms.

Only 28 firms experienced a credit downgrade, including 20 public and 8 private firms. We estimate a probit model (unreported) using an individual loan as the unit of observation relating rating downgrades to loan and borrower characteristics. Overall, we cannot reject the null hypothesis that private and public firms perform similarly after origination based on this metric.

4.5.2. Ex-post changes in sales growth

To the extent that relevant unobserved characteristics are related to future growth prospects, we use changes in sales growth as a proxy for ex-post performance. For example, private firms might have more growth options than public firms. If so, we would expect significantly different growth rates for private relative to publicly traded firms. We test this hypothesis using 1, 2 and 3 year sales growth rates as dependent variable and relate them to PUBLIC and the same control variables used in the prior section. Panel B of Table 7 shows our results. t+1, t+2 and t+3 indicate the 1, 2 and 3 year sales growth rates, respectively. Again, we do not find evidence that public firms grow differently than private firms.

4.5.3. Ex-post performance of loans in the secondary loan market

The recent literature in banking and corporate finance discusses the effects of timely information production in secondary markets and the impact on firms' capital structure and cost of capital. For example, Drucker and Puri (2009) analyze the information production in the secondary loan market and identify significant benefits for borrowers as to increased access to capital and more durable lending relationships. Norden and Wagner (2008) examine information production in CDS markets and the impact on loan spreads. Thus, information generated from loan trades might be particularly valuable for the private firms in our sample and secondary market prices therefore a natural candidate to study ex-post performance of private and public firms.

We supplement our dataset using daily secondary market loan prices for the 1999 to 2007 period from the Loan Syndication and Trading Association (LSTA) and Loan Pricing Corporation (LPC) market-to-market pricing service.[23] 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

[23] For more details about the secondary loan market and this dataset see for example Gande and Saunders (2008) and Wittenberg-Moerman (2005).

date.

Panel C of Table 7 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 "liquid" and those that have not been traded as "illiquid", respectively. On average, 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% versus 7.8% for loans received by public firms. Until 1999, secondary loan trading was virtually non-existent in Europe as reflected also in our sample. Even between 1999 and 2002, only a small number of loans were traded after origination.[24] 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% 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.

We match private and public firm loans based on firm size, industry, leverage, loan type, loan vintage year and time when loan comes to secondary market and consider the closest private loan a match. We use daily mid quotes to proxy for the transaction price. To analyze whether or not public firms perform better in the secondary loan market than private firms, we use daily price changes to calculate the returns (R_i) for public and matched private firm loans and examine the cross-section of cumulative abnormal returns (CAR). The CAR for public loan i is defined as

$$CAR_i \equiv \sum_{t=1}^{T} (R_{public,t} - R_{matched-private(i),t}).$$

We calculate returns 1 year after loan origination or when LSTA stops quoting the loan and drop all loans which only have zero return trading days. Cleaning the data results in 48 loans of public firms that can be matched to private firm loans. The results are reported in Panel D of Table 7. On average, the 1 year CAR of public firm loans is strictly negative, i.e. public firms perform striclty worse in the secondary loan market compared to private firms.

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

This result, however, is only marginally significant.

Taken together, we do not find evidence that public firms perform better than private firms after loan origination and thus our propensity matched results based on observables at the time of loan origination are likely to be relatively robust measures of the loan cost disadvantages of being a private firm.

5. Sources of Loan Cost Disadvantages of Private Firms

5.1. Informational transparency and the costs of being private

In this section, we analyze whether the costs of being private are particular pronounced in high information asymmetry environments. Prior research documents the importance of informational transparency in explaining loan spreads. For example, Bharath, Dahiya, Saunders, and Srinivasan (2008) show that syndicate members demand an additional premium if firms are opaque because syndicate moral hazard is amplified. Or, as shown in Santos and Winton (2008), lenders may extract an information-based rent when borrowers are opaque. Here, we provide evidence of the importance of opaqueness by plotting the loan spreads for public and matched private firms as a function of the propensity score where a high propensity to be public score is consistent with greater transparency in information production (for example stock market listing. Subsequently, we use stratifications of the sample (based on control variables, such as borrower size and age).

[Figure 2]

Figure 2 shows 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 which is consistent with more transparent firms paying lower spreads. Second, the loan spread of the matched private firms is higher than the spread of public firms across all propensity scores. Third and most importantly, the public-private firms difference in spreads declines as a function of the propensity score. This result suggests that the cost of being private dissipates for private firms with a high propensity of being public. The intuition behind this result is that high propensity score private companies become increasingly similar to public companies and this is reflected in almost identical loan spreads.

We next use stratifications of our matched sample along borrower size, bond market access and age as additional proxies for informational transparency.

[Table 8]

Table 8 reports the cost savings of a public firm (the coefficient of PUBLIC). Negative values, therefore, denote the loan cost of being private. We stratify the sample by three company characteristics: (1) firm size (measured by total assets), (2) bond market access, and (3) firm age using nearest neighbor (with 50 (100) neighbors) and local linear matching.

1. We divide our matched sample into quartiles based on the firms' total assets: 1st quartile: < \$610.33 million; 2nd quartile: \$610.33 million < x <= \$1,505.60 million; 3rd quartile: \$1,505.60 million < x <= \$4,979.45 million; 4th quartile: > \$4,979.45 million.
2. We also divide these data according to whether a company has bond market access or not. Bond market access is measured by whether the firm has issued public bonds during the last 5 years prior to a loan activation date.
3. Finally, we divide our data into firm age quarties, where firm age quantiles are: 1st quartile: <3.249 years; 2nd quartile: 3.341 years < x <= 6.696 years; 3rd quartile: 6.696 years < x <= 20.623 years; 4th quartile: > 20.623 years.

Table 8, column (1) shows the mean spread on loans to public firms and columns (2) through (4) the difference in the mean spreads between public and private companies (the impact of being public) using nearest neighbor 100, 50 and local linear regressions (LLR), respectively (standard errors are reported in parentheses). As expected, mean spreads for public firms decline from the smallest to the largest size quartile, i.e. from 149bps to 88bps. The spread difference between private and public firms is significant across all size quartiles and for both nearest neighbor and local linear matching methods. We obtain the mean spread for private firms by adding the spread difference in columns (2) to (4) back to the mean spread for public firms in column (1). The results show that the mean spread for private firms also declines from the smallest to the largest quartile. For example, for the smallest size quartile and the nearest neighbor matching with 100 nearest neighbors, we find a mean spread for private firms of 149bps+48bps=197bps; for the largest size quartile and the same matching method, the mean spread is 88bps+53bps=141bps.[25]

[25] As we use different loans to private firms to create the matched sample for each method, we also obtain different spread estimates. For example, the mean spread for private firms decreases from 197bps to 141bps

We further stratify our sample according to whether or not firms have bond market access. Loan spreads are generally smaller for public and private firms if they have access to bond markets (see for example, Faulkender and Petersen (2006)).[26] However, public firms seem to benefit relatively more than private firms from bond issuance. There are at least two explanations as to why public firms might benefit more if they have access to public debt markets. One explanation is that banks price loans lower to attract bond underwriting fees and related business (Drucker and Puri (2005)). An alternative explanation relates to companies with access to public debt having higher leverage ratios (Faulkender and Petersen (2006). That is, since leverage increases the firm's probability of default, banks might expect public firms to better handle higher leverage as they have multiple funding sources and a broader investor base.

We also stratify the sample by borrower age (vintage in years) and estimate the spread difference for public versus private firms. There is no clear pattern to public firms' spreads as a function of borrower age, with the mean spread staying relatively constant across firm age quartiles. However, adding the estimated impact of being private to the mean public spread, we find that loan spreads for private borrowers are decreasing as borrowers get older. That is, younger private firms have a significant cost disadvantage compared to younger public firms with a cost disadvantage to private firms of between 56bps and 73bps depending on the matching method used. The cost disadvantage to private firms is smallest for the oldest borrowers, the estimates for the nearest neighbor matching with 50 neighbors and the local linear regression are even insignificantly different from zero for the very oldest firms. This result is consistent with the view that older established private firms are sufficiently transparent to enjoy the same loan costs as similarly aged public firms.

In summary, stratifying by borrower size, bond market access and borrower age shows that public firms' relative loan cost benefits are largest when borrowers are opaque, which is the case for the smallest and the youngest borrowers, while the benefits of being public are smallest if borrowers are large and old.

---

across the size quantiles using the 100 nearest neighbors, whereas the mean spread decreases from 186bps to 113bps using local linear matching. Consistent with Table 6, the estimates are lowest for the local linear matching.

[26] The mean spread for private firms can be calculated adding the impact to the mean spread for public firms.

5.2. The joint impact of lending relationships on the costs of being private

Much of the recent literature on banking has discussed the importance of bank lending relationships. Thus, a natural question to ask is "do both private and public firms benefit from lending relationships"? Moreover, "do public firms benefit more from lending relationships than private firms"? To answer these questions, we analyze the joint impact of size and lending relationships on private versus public firms' loan spreads.

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 (see e.g. Ljungqvist, Marston, and Wilhelm (2006) and Bharath, Dahiya, Saunders, and Srinivasan (2008)). 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 1 if one of the lead banks in the current loan syndicate is a relationship lender.

[Table 9]

The results are reported in Table 9. Columns (1) and (2) show the mean spread of public firms and the spread difference between public and private firms, if firms borrow from a relationship lender. Columns 3 and 4 show the same but for non-relationship loans (standard deviations / errors are given in parentheses).

We first examine whether public firms benefit from having lending relationships by comparing the mean spreads for public companies versus private companies for relationship and non-relationship loans (i.e. columns (1) and (3)) within each size group and find that public firms, in general, benefit more from relationships by paying lower spreads[27], and the relationship benefit for public firms (i.e. the spread difference between relationship versus non-relationship loans) increases with firm size. For example, the spread difference in the lowest size quartile is 35bps (159bps minus 124bps) and increases to 62bps (121bps minus 59bps) in the upper quartile. This finding together with our earlier results implies that borrower transparency is important, i.e. public firms benefit more as lenders pass on a greater share of relationship benefits to these larger borrowers.[28]

We next examine whether private firms also benefit from lending relationships. Adding columns (1) and (2) (for private firm relationship loans) and columns (3) and (4) (for private

[27] With the second size quartile as an exception.

[28] This finding is consistent with the results from the relationship lending literature (e.g. Fama (1985)), particularly the literature on lending relationship and loan terms (e.g. Bharath, Dahiya, Saunders, and Srinivasan (2008)).

firm non-relationship loans) shows that private firms' loan spreads are lower if they borrow from a relationship lender. For example, for the smallest size quartile and nearest neighbor matching with 100 nearest neighbors, we find a mean spread for small private firms of 124bps+48bps=172bps if they have lending relationships; by contrast, for small private firms that don't have lending relationships, the mean spread is 159bps+43bps=202bps. This implies that small private firms save 30bps by borrowing from a relationship lender. However, large private firms save less, the loan spread difference for relationship versus non-relationship loans is 22bps.[29]

Do both public and private companies benefit equally? To answer this question we compare the relative cost savings of having a relationship lender for private versus public firms. Interestingly, we find that large public firms benefit from relationships significantly more than large private firms (62bps versus 22bps if 100 nearest neighbor matching is used), while small public firms only have a small relationship benefit over small private firms (35bps versus 30bps cost savings). Nevertheless, overall, public firms benefit more from establishing banking relationships.

6. Robustness

6.1. Information opacity

As a robustness check, we employ three additional/alternative measures of information opacity and allow them to vary among public firms to assess the loan cost difference between different types of public firms and private borrowers. These different measures are: (i) stock exchange affiliation, (ii) analyst coverage, (iii) being listed among the Fortune 500 firms. We run tests on (i) and (ii) using a subset of public firms where (historic) information about segment affiliation and index membership are available.

[Table 10]

The London Stock Exchange offers two markets for listings: (i) the Main Market and (ii) the Alternative Investment Market (AIM).[30] Panel A of Table 10 shows descriptive statistics (borrower total assets (Total Assets), loan spread (AISD), the number of shareholders

[29] These estimates are similar for the other matching methods.

[30] 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 transaction (except reverse takeovers or disposal resulting in a fundamental change of business). Companies, however, need a nominated broker who organizes the flotation and a nominated advisor (Nomad) who

(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. As can be seen, the FTSE 100 and FTSE 250 firms from the Main Market are much larger in size, pay on average lower spreads, have a more widely dispersed ownership structure[31] and borrow at shorter maturities 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, they pay on average much larger spreads. In our regressions, we employ two cohorts of public firms. The first cohort comprises FTSE 100 and FTSE 250 companies which can be thought of as the most transparent firms.[32] The second cohort 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.

Panel B of Table 10 reports the regression results. Columns (1) and (2) show the results using stock exchange segment affiliation as an information measure where FTSE 100/FTSE 250 is a dummy variable equal to one if the firm's equity is traded as part of these indexes. Column (1) shows the results. As can be seen, FTSE 100 and FTSE 250 firms pay 41bps lower spreads than other public borrowers. To analyze the loan spread differences between the two public firm cohorts and our private sample firms, we introduce two other dummy variables, PUBLICx(FTSE 100/FTSE 250) and PUBLICx(SMALL CAP/OTHER/AIM). Private firms are the ommited group. We find that FTSE 100/FTSE 250 firms pay on average 54bps lower spreads than private borrowers. Interestingly, however, there is no significant spread difference between private firms and Small Cap/Other/AIM firms. This finding has interesting implications for private firms considering a listing on the AIM to raise capital. Specifically, being listed on an opaque segment of the public market does not reduce a firm's borrowing costs.[33]

We also match the number of analysts (columns (3) and (4)) that issue earnings forecasts about a public borrower at the time of the loan. We obtain these data from I/B/E/S. Companies with little or no analyst coverage can be thought of as more informationally

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.

[31]Note that we introduce and operationalize the ownership data extensively in the next section.

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

[33]Whether it augments a firm's access to capital is beyond the scope of this paper.

opaque. In the subsample of public firms (column (3)), we test the impact of analyst coverage on loan spreads using the number of analysts (NO. ANALYSTS) giving recommendations for the stock around the time the loan was issued as an information proxy.[34] However, we do not find (statistically) significant evidence of an impact of analyst coverage on loan spreads among public firms. To strengthen our tests, we introduce two interaction terms in column (4), where PUBLICx(HIGH ANALYST COVER) is a dummy variable equal to one if the public firm has high analyst coverage and high analyst coverage is defined as those public firms in the upper quartile of the number of analysts covering public firms and PUBLICx(LOW ANALYST COVER) where a dummy variable is equal to one if the public firm has low analyst coverage, i.e. is in the lowest analyst coverage quartile.[35] Private firms are the omitted group. The coefficients on both interaction terms are negative and statistically significant, i.e. public firms pay lower loan spreads than private firms. However, the coefficients are not significantly different from one another which supports our earlier result that analyst coverage, in and of itself, does not significantly influence spreads on loans received by public firms, a result consistent with banks having superior monitoring and information advantages compared to outside analysts. In Column (5), we use the information that a company does (not) belong to the Fortune 500 companies as information proxy. Public firms which are not among the Fortune 500 firms pay 35bps lower spreads compared to private firms but higher spreads than Fortune 500 firms. This difference, however, is not statistically significant at a meaningful level of confidence. Overall, our results confirm that information opacity (and in particular information opacity associated with the corporate status of being private) is important in explaining the additional costs of private debt.

6.2. The effect of ownership structure on loan spreads

In the preceding sections, we argued that informational transparency is important to understanding the loan cost disadvantage of private versus public companies. However, our results may in part stem from differences in ownership structure between public and private firms. In this section, we examine two important aspects of ownership structure on bank debt costs: (i) inside ownership concentration and (ii) private equity ownership.[36]

[34] We lose 34 observations because we were unable to match the borrower name to I/B/E/S. We identify 239 public firms with non-zero analyst coverage at the time the loan was issued. The average number of analysts is 13.3 (the median is 11.5), and 69 firms have less than 3 analysts.

[35] For comparison, the average number of analysts recommending stocks within the group of high (low) analyst coverage is 30.6 (8.2).

[36] Our paper is silent about the effect of family ownership on loan spreads primarily because of the lack of data on family ownership.

i. Inside Ownership Concentration.

The question as to how a firm's ownership structure influences its cost of capital is related to the corporate governance literature, in particular, the literature on (1) ownership concentration and corporate risk taking and (2) ownership structure and takeover likelihood.[37]

In order to show that our result of lower loan spreads for public firms is not explained by lower insider ownership and control (and this agency problems) in such firms, we collect data on firm ownership from Bureau van Djik's "Ownership" database which provides approximately 15 million active direct owner and subsidiary links.[38] The database reports about 9 million companies with at least one shareholder and the average number of shareholders is 1.7; 178,000 firms have more than 5 recorded shareholders. If data are available for the company, the database provides (among other things) 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 percent of ownership). The different types of shareholders recorded in the database include banks, financial/insurance companies, fund families[39] as well as firm directors/employees/managers.

[Table 11]

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. As a proxy for ownership concentration, we use the number of reported shareholders (OWNERS) in the

[37] Amihud and Lev (1981) have argued that there is a positive relation between insider ownership and risk taking because 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, Ferris, Sarin, and Awasthi (1996). That is, the relationship between insider ownership and risk taking might be positive at first but later on be negative because (a) too much of the manager's personal wealth is tied up in the firm so that inside owners prefer less risk and (b) 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 relation is negative: the higher the percentage of insider equity ownership the less likely the company is a takeover target. Managerial ownership vests additional control to deter acquisitions because the wealth gain from being acquired is lower than benefits of the incumbency loss. The implication again is that such firms are likely to be less efficient and hence be subject to a higher loan spread.

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

[39] 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.

regression described in section 4 and rerun our tests.[40] The results are reported in Panel A of Table 11. Even after controlling for ownership, private firms still pay 36bps higher loan spreads than public firms confirming our earlier findings (column (1)). However, ownership structure itself is an important factor in explaining loan spreads. For example, increasing the number of shareholders from the highest to the lowest ownership concentration quartile reduces loan spreads by 25bps. As the variation in the number of shareholders is rather limited in the subsample of private firms, we also run our tests separately for private and public firms. The results are reported in columns (2) and (3) of Panel A. 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)).

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 on loans to private firms.[41] We define ownership concentration as follows: ownership concentration is high (low) if the HHI is above (below) 0.67.[42] Public firms with highly concentrated ownership are then comparable to private firms.[43] Consistent with our prior result, we find that public firms with high owernship concentration pay higher loan spreads than public firms with low ownership concentration (column (4)). In column (5), we introduce two interaction terms, where PUBLIC x HHI(LOW) is a dummy variable equal to 1 if public firms have low ownership concentration, and where PUBLIC x HHI(HIGH) is a dummy variable equal to 1 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, 40bps lower loan spreads than private firms and this result is statistically significant and economically meaningful.

ii. Private Equity Ownership.

[40] Note that this number does not include private (unnamed) shareholders. The database only reports the aggregated percentage owernship 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).

[41] We do not split our private firms into low versus high ownership firms because there is only little variation in the ownership measure.

[42] The HHI is bounded between 0 and 1.

[43] 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.

The UK experienced a dramatic increase in buyout activity during the last years of our sample period: the deal value increased from GBP 17bn in 2003 to GBP 45bn in 2007.[44] Further, the major financing for these deals did not come from high yield bond issues (as has been standard in the US) but rather from private debt and in particular bank loans (Toms and Wright (2005)). Moreover, we find that a considerable proportion of our deals had private equity involvement as we report in detail below. Indeed, private equity firms have been involved in both private and public firm deals including (i) Public-to-private transactions (PtP), (ii) LBO/MBO's (which are not PtP's)[45], (iii) Acquisitions, and (iv) Recapitalizations.

Companies that are owned or managed by private equity firms may well be inherently different than other firms and might therefore be an important component of loan spreads. Specifically, private equity financed firms employ a higher level of leverage which increases firm bankruptcy risk.[46] 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 a number of different data sources. First, LPC Dealscan contains the field "loan purpose comment", which gives information about whether the deal is a buyout transaction, and "sponsor", which indicates 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 check, 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 either (i) a PtP, (ii) a LBO/MBO (other than a PtP), (iii) an acquisition or (iv) a recapitalization. We provide some descriptive statistics of these deals below.

[Figure 3]

Our data show that 17% of all loans received by public firms are associated with PtP transactions, only 1% with LBO/MBO transactions and 1% with other private equity backed transactions such as acquisitions or recapitalisations. There is no private equity firm at all

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

[45] These deals can be first-time buyouts as well as secondary or tertiary buyouts. Further, private equity firms can buy a single division from a publicly traded firm without taking the firm private

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

involved in 81% of the loans in our sample. This is shown graphically in Figure 3. 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 Panel B of Table 11. 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 1 if the firm is taken private, LBO/MBO is a dummy variable equal to 1 if the deal is a buyout but the firm is not taken private, and PRIVATE EQUITY (NOT BUYOUT) is a dummy variable equal to 1 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, i.e. private firms pay approximately 26bps higher spreads than public firms and this difference is highly significant (column (1)), nevertheless, the influence of private equity participation on loan spreads is considerable with private equity owned firms paying 76bps to 108bps 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 1 if the firm is public and the deal involves a private equity sponsor. This variable captures all deals of public firms with private equity participation. The results are reported in column (5) of Panel B. Three interesting results emerge: First, if no private equity is involved, private firms pay 28bps higher loan spreads compared to public firms and the difference is significant at the one percent level. This is consistent with our earlier results that information imperfections are of a first order importance in explaining the loan cost disadvantage of private firms. Second, private firms managed or owned by private equity pay 92bps 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. Third, spreads for public firms backed by private equity are not significantly different from spreads paid by private firms without private equity involvement. This corresponds to our earlier intuition that the spread difference is reduced (and even

disappears) if deals by public firms (but not private firms) involve private equity.

Thus, there is evidence that ownership and/or governance of firms is important in explaining loan spreads over and above information effects.

6.3. Loan liquidity and loan spreads

One potential impact on loan spreads 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.[47] A loan cost disadvantage of being private might therefore result if their loans are less liquid. To examine this, we introduce the dummy variable LIQUID which takes the value 1 if the loan is traded in the secondary loan market after origination and rerun our tests. Our results show that, even after controlling for loan liquidity, private firms still pay 34bps higher loan spreads, consistent with our earlier results.

7. Conclusion

We examine a unique dataset of private and public UK 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 about 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. In particular, whether private debt costs may offset benefits from going private. We address this question by dealing with the endogeneity of companies' legal status through matching

[47] We acknowledge that there are at least two alternative channels as to how the secondary loan market influences loan spreads in addition to the diversification effect described above. First, there is 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), and Billett, Flannery, and Garfinkel (1995)). Secondary loan prices reveal information about the firm to investors and may lead to a reduction in the cost of debt (information effect), for example, by reducing the information premium demanded by banks or by reducing the informational advantage of relationship banks (Rajan (1992)). Second, 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 commitment device to diligently monitor the borrower (Sufi (2007) and Bharath, Dahiya, Saunders, and Srinivasan (2007)), which might be effectively reduced and lead to higher spreads demanded by lenders (monitoring effect). Disentangling these channels, however, is beyond the scope of this paper. For our purposes, it is sufficient to show that private firms still face significantly higher loan costs even after controlling for loan liquidity.

loans of private and public firms by means of propensity scores. We find that private firms pay 29-42bps higher loan spreads than public firms.

Analyzing loan spreads as a function of the propensity score we find that both public and private firms' spreads decline as the propensity score increases. However, the spread difference dissipates if firms have a higher propensity of being public. We also analyze the sources of private firms' loan cost disadvantage. We do this by stratifying our sample by borrower size, age and bond market access and find convincing evidence that borrower informational transparency matters. Specifically, young and small private borrowers have a significant disadvantage when compared to young and small public borrowers. We further look at relationships benefits for private and public firms. Both public and private firms benefit from having bank lending relationships. However, large public firms benefit more from having relationships compared to small public borrowers which is consistent with greater relationship benefits being passed on to larger firms. Interestingly, large public firms have a significant relationship advantage over large private firms but that cost advantage dissipates for small public firms relative to small private firms.

Using different measures of borrower information opacity, we find further support for the result that information imperfection, particularly related to being a private company, is a significant and economically relevant factor of bank loan spreads. For example, we find that firms that are listed on opaque segments of the London Stock Exchange do not receive lower spreads compared to private firms. Our results are robust to alternative explanations such as potential missing "unobservable" differences in borrower characteristics, insider ownership concentration, private equity firm participation or differences in the liquidity of loans to private and public firms. Taken together, our results suggest that private firms face significant loan cost disadvantages compared to publicly traded firms.

References

Allen, Franklin, Elena Carletti, and Robert Marquez, 2006, Stakeholder capitalism, corporate governance and firm value, *Working Paper, University of Pennsylvania*.

Amihud, Yakov, and Baruch Lev, 1981, Risk reduction as a managerial motive for conglomerate mergers, *Bell Journal of Economics* 12, 605–617.

Archarya, Viral, Kose John, and Suresh Sundaram, 2006, Cross-country variations in capital structures: The role of bankruptcy codes, *Working Paper*.

Ball, Ray, and Lakshmanan Shivakumar, 2005, Earnings quality in uk private firms: comparative loss recognition timeliness, *Journal of Accounting and Economics* 39, 83–128.

Best, Ronald, and Hang Zhang, 1993, Alternative information sources and the information content of bank loans, *The Journal of Finance* 48, 1507–1522.

Bharath, Sreedhar, Sandeep Dahiya, Anthony Saunders, and Anand Srinivasan, 2007, So what do i get? the bank's view of lending relationships, *Journal of Financial Economics* 85, 368–419.

——— , 2008, Lending relationships and loan contract terms, *Review of Financial Studies (forthcoming)*.

Billett, Matthew T., Mark J. Flannery, and Jon A. Garfinkel, 1995, The effect of lender identity on a borrowing firm's equity return, *The Journal of Finance* 50, 699–718.

Boehmer, E., and Alexander Ljungqvist, 2004, On the decision to go public: Evidence from privately-held firms, *Working Paper*.

Brav, Omar, 2005, How does access to the public capital market affect firms' capital structure?, *Working Paper, University of Pennsylvania*.

Chemmanur, T.J., S. He, and D. Nandi, 2007, The going public decision and the product market, *Working Paper*.

Conniffe, Denis, Vanessa Gash, and Philip J. O'Connell, 2000, Evaluating state programmes: "natural experiments" and propensity scores, *The Economic and Social Review* 31, 283–308.

DeAngelo, H., L. DeAngelo, and E. Rice, 1984a, Going private: Minority freezeouts and stockholder wealth, *Journal of Law and Economics* pp. 367–402.

——— , 1984b, Going private: The effects of a change in corporate ownership structure, *Midland Corporate Finance Journal* pp. 35–43.

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

Drucker, Steven, and Manju Puri, 2005, On the benefits of concurrent lending and underwriting, *The Journal of Finance* 60.

——— , 2009, On loan sales, loan contracting, and lending relationships, *Review of Financial Studies (forthcoming).*

Fama, Eugene F., 1985, What's different about banks?, *Journal of Monetary Economics* 15, 29–39.

Fan, Jianqing, 1992, Design-adaptive nonparametric regression, *Journal of the American Statistical Association* 87, 998–1004.

Faulkender, Michael, and Mitchell A. Petersen, 2006, Does the source of capital affect capital structure?, *Review of Financial Studies* 19, 45–79.

Gadanecz, Blaise, 2004, The syndicated loan market: Structure, development and implications, *BIS Quarterly Review.*

Gande, Amar, and Anthony Saunders, 2008, Are banks still special when there is a secondary market for loans?, *Working Paper.*

Heckman, James J., Hidehiko Ichimura, and Petra Todd, 1997, Matching as an econometric evaluation estimator: Evidence from evaluating a job training program, *Review of Economic Studies* 64, 605–654.

——— , 1998, Matching as an econometric evaluation estimator, *Review of Economic Studies* 65, 261–294.

Helwege, J., and F. Packer, 2004, The decision to go public: Evidence from mandatory sec filings of private firms, *Working Paper.*

Ivashina, Victoria, 2007, Asymmetric information effects on loan spreads, *Journal of Financial Economics (forthcoming)*.

James, Christopher, 1987, Some evidence on the uniqueness of bank loans, *Journal of Financial Economics* 19, 217–235.

Jones, Jonathan D., William W. Lang, and Peter J. Nigro, 2005, Agent bank behavior in bank loan syndication, *Journal of Financial Research* 28, 385–402.

Kaplan, S.N., 1989a, The effects of management buyouts on operating performance and value, *Journal of Financial Economics* pp. 217–254.

——— , 1989b, Management buyouts: Evidence on taxes as a source of value, *Journal of Finance* 44, 611–632.

——— , 1991, The staying power of leveraged buyouts, *Journal of Financial Economics* 29, 287–314.

Lee, Sang Whi, and Donald J. Mullineaux, 2004, Monitoring, financial distress, and the structure of commercial lending syndicates, *Financial Management (2000)* 33, 107–130.

Lehn, K., and A. Poulsen, 1989, Free cash flow and stockholder gains in going private transactions, *Journal of Finance* pp. 771–787.

Ljungqvist, Alexander, and T. Jenkinson, 2001, *Going Public: The Theory and Evidence of How Companies Raise Equity Finance* (Oxford University Press, Oxford) 2nd edn.

Ljungqvist, Alexander, F. Marston, and W. Wilhelm, 2006, Competing for securities underwriting mandates: Banking relationships and analyst recommendations, *Journal of Finance* 61, 301–340.

Lummer, Scott L., and John J. McConnell, 1989, Further evidence on the bank lending process and the capital-market response to bank loan agreements, *Journal of Financial Economics* 25, 99–122.

Michaely, Roni, and Michael R. Roberts, 2007, Corporate dividend policies: Lessons from private companies, *Working Paper*.

Norden, Lars, and Wolf Wagner, 2008, Credit derivatives and loan pricing, *Journal of Banking and Finance* 32, 2560–2569.

Petersen, Mitchell A., 2008, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies (forthcoming).*

Rajan, Raghuram, 1992, Insiders and outsiders: The choice between informed and arm's length debt, *The Journal of Finance* 47.

Ritter, R.J., 2003, Investment bnaking and securities issuance, in G. Constantinides, M. Harris, and Rene Stulz, ed.: *Handbook of Economics and Finance* (Amersterdam: North-Holland).

Rosenbaum, P. R., and Donald B. Rubin, 1983, The central role of the propensity score in observational studies for causal effects, *Biometrika* 70, 41–55.

Rubin, Donald B., and Neal Thomas, 2000, Combining propensity score matching with additional adjustments for progostic covariates, *Journal of the American Statistical Association* 95, 573–585.

Santos, Joao A. C., and Andrew Winton, 2008, Bank loans, bonds, and information monopolies across the business cycle, *Journal of Finance* 63.

Schenone, Carola, 2008, Lending relationships and information rents: Do banks exploit their information advantages?, *Review of Financial Studies (forthcoming).*

Simons, Katerina, 1993, Why do banks syndicate loans?, *New England Economic Review* Jan/Feb, 45–52.

Smith, J., and Petra Todd, 2005, Does matching overcome lalonde's critique of nonexerimental estimators?, *Journal of Econometrics* 125, 305–353.

Song, Moon H., and Ralph A. Walkling, 1993, The impact of managerial ownership on acquisition attempts and target shareholder wealth, *Journal of Financial and Quantitative Analysis* 28, 439–457.

Strahan, Philip E., 1999, Borrower risk and the price and nonprice terms of bank loans, *Working Paper.*

Sufi, Amir, 2007, Information asymmetry and financing arrangements: Evidence from syndicated loans, *The Journal of Finance* 62, 629–668.

Toms, Steven, and Mike Wright, 2005, Divergence and convergence within anglo american corporate governance systems: Evidence from the us and uk, 1950-2000, *Business History* 47, 267–295.

Wittenberg-Moerman, Regina, 2005, The role of information asymmetry and financial reporting quality in debt contracting: Evidence from the secondary loan market, *Working Paper*.

Wright, Peter, Stephen P. Ferris, Atulya Sarin, and Vidya Awasthi, 1996, Impact of corporate insider, blockholder, and institutional equity ownership on firm risk taking, *Academy of Management Journal* 39, 441–463.

Appendix

Regulation: UK company law for private and public companies

Since only a limited number of papers are concerned with the UK market and differences between private and public companies in particular, we provide some further information on UK company law in this section.[48]

All limited liability companies are formed by incorporation with the Companies House in the UK and registered as public or private companies.[49] Public companies must incorporate "public limited company" or "plc" in their name, private limited companies need only include "limited". Public companies must have a minimum share capital of GBP 50,000 before they start doing their business. There is no minimum share capital requirement for private companies. The most important distinction between private and public companies is in their ability to raise funds from the general public. A public company has unrestricted rights to offer shares or debentures to the public, but such offerings are prohibited for private companies.

Prior to 1967, only public companies were required to file their financial statements with the Registrar of Companies House. The Companies Act of 1967 requires all companies, private and public, to file their financial statements annually with the Registrar. 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.[50] In addition, they may prepare and deliver abbreviated accounts to the Registrar. Public companies and certain companies in the regulated sectors cannot qualify as small or medium-sized companies.[51] Similarly, companies which are part of a group which has members who are 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

[48] This section is primarily based on the discussion in Ball and Shivakumar (2005) and Brav (2005). Please refer to these papers for further details and for exact references to the specific sections in the UK Companies Act to Ball and Shivakumar (2005).

[49] The main functions of 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)

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

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

criteria for two consecutive year: annual turnover must be GBP 5.6 million (GBP 22.8 million) or less; the balance sheet total must be GBP 2.8 million (GBP 11.4 million) or less; the average number of employees must be 50 (250) or fewer.[52]

The financial statements of private (public) companies must be filed within ten (seven) months of their fiscal year. Failure to file is a criminal offense. All financial statements must be prepared in accordance with UK accounting standards, whether the firm is private or public. They must be audited if annual sales exceed GBP 1 million. [53]

UK tax laws likewise do not descriminate between public and private firms. London Stock Exchange listing rules require additional disclosures for public companies, but the rules do not mandate accounting standards for financial reporting. In all important respects, the UK regulatory regimes governing financial reporting for public companies and all but the smallest private companies are equivalent.

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

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

TABLE 1
Descriptive Statistics of Loan Facilities

Panel A: Calender Time Distribution of Loans			
Year of Loan	Private (Public=0)	Public (Public=1)	Total
1989	3	3	6
1990	3	3	6
1993	1	5	6
1994	4	10	14
1995	4	18	22
1996	3	20	23
1997	3	21	24
1998	6	56	62
1999	40	75	115
2000	59	115	174
2001	43	91	134
2002	55	80	135
2003	69	78	147
2004	121	87	208
2005	175	81	256
2006	227	51	278
2007	193	39	232
Total	1,009	833	1,842
Panel B: Calender Time Distribution of Loan Amounts			
1989	1,000.00	288.20	644.10
1990	55.74	717.75	386.74
1993	591.02	231.67	291.56
1994	234.08	378.39	337.16
1995	33.67	936.42	772.28
1996	156.83	726.92	652.56
1997	285.66	376.73	365.35
1998	245.16	419.23	402.39
1999	125.52	574.97	418.64
2000	850.45	1,058.26	987.80
2001	530.41	395.68	438.92
2002	97.66	336.97	239.47
2003	227.97	365.75	301.08
2004	167.87	539.36	323.25
2005	122.03	717.13	310.33
2006	108.10	742.71	224.52
2007	341.46	1,539.03	542.77
Total	5,173.63	10,345.15	15,518.78

TABLE 1 (continued)

Panel B: Industry Classification of Borrowers			
One Digit SIC Code	Private (Public=0)	Public (Public=1)	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 C: Loan Purposes			
Loan Purpose	Private (Public=0)	Public (Public=1)	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

Variabel	N	Mean	Std.Dev.	Min	25th Pctile	Median	75th Pctile	Max
Panel A: Loan Characteristics								
AISD (Basis Points)	1,842	197.93	182.61	7.55	75	175	250	1,200
Loan Facility Amount ($ Millions)	1,842	417.38	1,07.75	0.40	41.37	129.65	377.91	17,796.23
Maturity of Loan (Months)	1,842	68.19	36.10	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	277,113.2
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	15.90	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)	270.18	110.42	22.03**
	(203.54)	(97.96)	(24.89**)
Loan Facility Amount ($ Millions)	236.71	636.22	-7.82**
	(877.14)	(1,241.38)	(-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**
	(0.40)	(0.50)	(-11.95**)
Panel B: Borrower Characteristics			
Total Assets ($ Millions)	1,616.32	8,984.63	-6.96**
	(8,165.59)	(29,639.58)	(-21.21**)
Leverage=(LT Debt/Total Assets)	0.28	0.25	2.83**
	(0.29)	(0.20)	(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**
	(300.90)	(991.88)	(-18.04**)
Age	23.26	34.14	-7.80**
	(25.63)	(32.81)	(-7.56**)
Growth	0.10	0.14	-1.19
	(0.84)	(0.47)	(2.87**)
Investment Grade	0.03	0.20	-11.15**
	(0)	(0)	(-11.44**)
Not Rated	0.92	0.70	11.92**
	(1)	(1)	(11.96**)

Significance levels : † : 10% * : 5% ** : 1%

TABLE 4
OLS Estimates

To analyze the hypothesis that public companies pay lower risk-adjusted loan spreads, we use a regression model of the following form:

$$AISD = PUBLIC + \sum \beta_i(BorrowerCharacteristics) + \sum \beta_j(LoanCharacteristics) + \sum \beta_k(Controls)$$

The table reports coefficient estimates from OLS regressions. The dependent variable is the AISD measured as the spread above LIBOR. Column (1) shows the results from the OLS regression. Column (2) shows the results from the panel data estimation using the least squares dummy variable approach. Public is a dummy variable measuring whether the firm is stock exchange listed. Growth is the sales growth rate ($\text{Sales}_t/\text{Sales}_{t-1}$). Leverage is the ratio of long term debt over total assets. Log(Cash) is the natural logarithm of "Cash & Equivalents" from the balance sheet. Log(Assets) is the natural logarithm of total assets. Log(AGE) is the natural logarithm of the age of the company measured in days. Tangible is the ratio of tangible over total assets. Log(1+Covarage) is the natural logarithm of one plus EBITDA over interest expense. Investment Grade is a dummy variable equal to one if the borrower has an investment grade rating. Not Rated is a dummy variable equal to one if the borrower is unrated (non investment grade borrowers are the ommitted group). Bond is a dummy variable if the borrower has accessed the public bond market within the last five years. Relationships is a dummy variable if the arranger of the loan is relationship lender of the borrower (he has been arranger in a loan within the last five years prior to the loan origination date). Term Loan is a dummy variable equal to one if the loan is a term loan. Log(Loan Size) is the natural logarithm of the facility size. Log(1+Maturity) is the natural logarithm of one plus the tenor of the loan measured in months. Secured is a dummy variable equal to one if the loan is secured with collateral. Secured Missing is a dummy variable equal to one if the secured status of the loan is missing (unsecured loans are ommitted). We further group the loans according to five different purposes: acquisition, corporate purposes, capital structure related purposes, project finance related purposes and other (which are ommitted). All regressions further include time fixed effects and 2-digit SIC industry codes. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level.
(Continued on next page)

TABLE 4 (cont'd)

Variable	Coefficient	(Std. Err.)
Public	-35.083**	(8.917)
Profitability	-1.853**	(.603)
Growth	8.090†	(4.419)
Leverage	11.482	(20.312)
Log(Cash)	-.0050	(0.004)
Log(Assets)	-2.032	(4.496)
Log(Age)	.1287	(3.352)
Tangible	-34.020*	(15.286)
Log(1+Interest Coverage)	6.501	(4.490)
Investment Grade	-82.761**	(23.226)
Not Rated	-74.772**	(22.617)
Bond	3.111	(12.914)
Relationships	7.988	(7.204)
Term Loan	10.621	(7.903)
Log(1+Maturity)	46.179**	(7.577)
Log(Loan Size)	-17.695**	(3.709)
Secured	-3.422	(26.147)
Secured Missing	-.3096	(15.878)
Refinancing	-7.323	(8.368)
Purpose: Acquisition	65.977**	(10.026)
Purpose: Corporate	-17.819*	(8.796)
Purpose: Capital Structure	8.240	(10.209)
Purpose: Project Finance	–75.068**	(22.809)
Year Fixed Effects	Yes	
Industry Fixed Effects	Yes	
N	1,764	
R^2	0.383	

Significance levels : † : 10% * : 5% ** : 1%

TABLE 5
Probit Model of Being Public

This table reports coefficient estimates of a probit model to identify the determinants why firms choose to be public. We estimate a model of the following form

$$Public = \beta_0 + \sum \beta_i(BorrowerCharacteristics) + \sum \beta_j(LoanCharacteristics) \sum \beta_k(Controls)$$

The dependent variable is PUBLIC, a dummy variable measuring whether the firm is stock exchange listed. PUBLIC_{t-1} measures the lagged status of the company. Profitability is the ratio of EBITDA to Sales. Growth is the sales growth rate ($\text{Sales}_t/\text{Sales}_{t-1}$). Leverage is the ratio of long term debt over total assets. Log(Cash) is the natural logarithm of "Cash & Equivalents" from the balance sheet. Log(Assets) is the natural logarithm of total assets. Log(AGE) is the natural logarithm of the age of the company measured in days. Tangible is the ratio of tangible over total assets. Log(1+Covarage) is the natural logarithm of one plus EBITDA over interest expense. Investment Grade is a dummy variable equal to one if the borrower has an investment grade rating. Not Rated is a dummy variable equal to one if the borrower is unrated (non investment grade borrowers are the ommitted group). Bond is a dummy variable if the borrower has accessed the public bond market within the last five years. Relationships is a dummy variable if the arranger of the loan is relationship lender of the borrower (he has been arranger in a loan within the last five years prior to the loan origination date). Term Loan is a dummy variable equal to one if the loan is a term loan. Log(Loan Size) is the natural logarithm of the facility size. Log(1+Maturity) is the natural logarithm of one plus the tenor of the loan measured in months. Secured is a dummy variable equal to one if the loan is secured with collateral. Secured Missing is a dummy variable equal to one if the secured status of the loan is missing (unsecured loans are ommitted). We further group the loans according to five different purposes: acquisition, corporate purposes, capital structure related purposes, project finance related purposes and other (which are ommitted). Further control variables include dummy variables for the year and the industry of the borrower (two-digit SIC code). The number of observations represent firm-year observations. Standard errors are clustered at the firm level.
(Continued on next page)

TABLE 5 (cont'd)

Variable	Coefficient	(Std. Err.)
Profitability	0.021**	(0.007)
Growth	0.174*	(0.071)
Leverage	0.385†	(0.211)
Log(Cash)	0.001**	(0.000)
Log(Assets)	0.246**	(0.050)
Log(Age)	0.199**	(0.036)
Tangible	-0.038	(0.154)
Log(1+Coverage)	-0.104*	(0.045)
Investment Grade	-0.912**	(0.224)
Not Rated	-0.391*	(0.172)
Bond	-0.575**	(0.168)
Relationship	-0.003	(0.090)
Term Loan	-0.082	(0.091)
Log(Loan Size)	0.093*	(0.042)
Log(1+Maturity)	-0.131†	(0.069)
Secured	-0.915**	(0.302)
Secured Missing	-0.276	(0.271)
Purpose: Acquisition	-0.844**	(0.135)
Purpose: Corporate	-0.088	(0.149)
Purpose: Capital Structure	-0.371**	(0.131)
Purpose: Project Finance	-0.123	(0.301)
N	1732	
Log-likelihood	-641.659	
$\chi^2_{(82)}$	1100.635	

Significance levels : † : 10% * : 5% ** : 1%

TABLE 6
Propensity Score Matching:
Nearest Neighbor Matching & Local Linear Matching

Panel A reports the OLS results with firm-level clustered standard errors for comparison. Panel B reports the results matching private and public firms on the basis of propensity scores with nearest neighbor matching. The nearest neighbor estimator chooses for each public loan the 100 (NN 100) or 50 (NN 50) private loans with closest propensity scores and uses the arithmetic averages of AISD for these private loans. Panel C reports the results matching private and public firms on the basis of propensity scores with local linear matching matching. Standard errors are calculated by bootstrapping with 50 (BS 50), 100 (BS 100) and 300 (BS 300) replications. We also report standard errors without bootstrapping.

	Procedure	Coefficient	(Std. Error)
Panel A: OLS Estimates			
		-35**	(9.100)
Panel B: Nearest Neighbor Matching			
NN 50	BS 50	-32**	(8.528)
	BS 100	-32**	(9.255)
	BS 300	-32**	(8.438)
	w/o BS	-32†	(16.559
NN 100	BS 50	-49**	(7.562)
	BS 100	-49**	(11.662)
	BS 300	-49**	(11.382)
	w/o BS	-49**	(15.060)
Panel C: Local Linear Matching			
Gaussian	BS 50	-29**	(10.618)
	BS 100	-29**	(9.355)
	BS 300	-29**	(10.079)
	w/o BS	-29†	(15.296)

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%

TABLE 7
Ex-Post Performance of Private versus Public Firms

Panel A of Table 7 shows ex-post changes in Z-Score as proxy for borrower credit quality. We use the modified Z-Score (Z') to reflect that half of our firms are privately held companies. We calculate Z' as follows,

$$Z' = 0.717T_1 + 0.8472T_2 + 3.107T_3 + 0.420T_4 + 0.998T_5$$

with T_1 as the ratio of NET CURRENT ASSETS to TOTAL ASSETS, T_2 as the ratio of RETAINED EARNINGS to TOTAL ASSETS, T_3 as the ratio of EBIT to TOTAL ASSETS, T_4 as the ratio of BOOK VALUE OF EQUITY to TOTAL LIABILITIES and T_5 as the ratio of SALES to TOTAL ASSETS. t+1, t+2 and t+3 are ex-post changes in Z' 1, 2 and 3 years after loan origination, respectively. The dependent variable is change in Z'. This table only reports the coefficient estimates for PUBLIC. Panel B reports the ex-post changes in sales growth for private versus public firms in year 1, 2 and 3 after loan origination. 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. Panel C reports the distribution of liquid and illiquid loans in the secondary loan market. A loan is defined as liquid if it was traded after loan origination. Panel D reports the cross-sectional test of cumulative abnormal returns (CAR) of public firm loans.

Panel A: Ex-post change in Z-Score

Variable	**(1)** **t+1**	**(2)** **t+2**	**(3)** **t+3**
Public	-4.489	-1.832	-4.251
	(3.890)	(4.227)	(5.331)
N	890	695	512
R^2	15.53	23.38	24.35
Significance levels :	† : 10%	∗ : 5%	∗∗ : 1%

Panel B: Ex-post change in sales growth

Variable	**(1)** **t+1**	**(2)** **t+2**	**(3)** **t+3**
Public	-0.073	0.130	0.363
	(0.111)	(0.130)	(0.371)
N	940	729	535
R^2	19.73	25.17	30.21
Significance levels :	† : 10%	∗ : 5%	∗∗ : 1%

TABLE 7 (cont'd)

Panel C: The seconday loan market - Distribution of liquid and illiquid loans

	Full Sample			Private Firms			Public Firms		
Year	**Illiquid**	**Liquid**	**Total**	**Illiquid**	**Liquid**	**Total**	**Illiquid**	**Liquid**	**Total**
1989	6	0	6	3	0	3	3	0	3
1990	6	0	6	3	0	3	3	0	3
1993	6	0	6	1	0	1	5	0	5
1994	14	0	14	4	0	4	10	0	10
1995	22	0	22	4	0	4	18	0	18
1996	23	0	23	3	0	3	20	0	20
1997	24	0	24	3	0	3	21	0	21
1998	62	0	62	6	0	6	56	0	56
1999	113	2	115	33	2	35	80	0	80
2000	186	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	76	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 D: Performance of public and private firm loans in the secondary loan market

CAR for public loan i is defined as

$$CAR_i \equiv \sum_{t=1}^{T} (R_{public,t} - R_{matched-private(i),t})$$

Variable	1 year CAR
N	48
Mean	-0.0045†
S.E.	0.0023
t-value	-1.94

Significance levels : † : 10%

TABLE 8
Impact of Being Public: Stratification by Borrower Characteristics

This table shows the impact of being a public company stratifying the sample by three company characteristics: (1) firm size (measured as total assets), (2) bond market access, and (3) firm age using nearest neighbor (with 50 (100) neighbors) and local linear matching. We use the following size quartiles: 1st quartile: <$610.33 million; 2nd quartile: $610.33 million < x <= $1,505.60 million; 3rd quartile: $1,505.60 million < x <= $4,979.45 million; 4th quartile: > $4,979.45 million. The age quartiles are defined as follows: 1st quartile: <3.249 years; 2nd quartile: 3.341 years < x <= 6.696 years; 3rd quartile: 6.696 years < x <= 20.623 years; 4th quartile: > 20.623 years.

		NN 100	NN 50	LLR
	Mean AISD for public firms (Std. Dev.) (1)	**Impact of being public (Std. Error) (2)**	**Impact of being public (Std. Error) (3)**	**Impact of being public (Std. Error) (4)**
Stratification by Size				
1 (lower quartile)	149	-48**	-40**	-37**
	(114.603)	(9.376)	(9.748)	(9.645)
2	125	-41**	-26**	-24**
	(88.119)	(7.293)	(7.817)	(7.586)
3	99	-55**	-33**	-31**
	(94.548)	(7.601)	(8.005)	(7.813)
4	88	-53**	-28**	-25**
	(94.862)	(7.308)	(7.607)	(7.478)
Stratification by Bond Market Access				
1 (Yes)	99	-58**	-39**	-34**
	(96.061)	(10.155)	(10.799)	(10.406)
2 (No)	118	-48**	-31**	-28**
	(127.269)	(4.509)	(4.764)	(4.693**)
Stratification by Age				
1 (lower quartile)	103	-73**	-56**	-56**
	(109.644)	(9.019)	(9.448)	(9.308)
2	131	-38**	-23**	-19*
	(83.390)	(7.101)	(7.729)	(7.575)
3	113	-52**	-35**	-31**
	(93.347)	(7.717)	(8.213)	(7.989)
4	114	-34**	-11	-10
	(114.159)	(8.869)	(9.162)	(9.086)

Significance levels : † : 10% * : 5% ** : 1%

TABLE 9
Joint Impact of Size and Lending Relationships on Loan Spreads

This table reports results for the joint impact of size and lending relationship on the impact of being public. Panel A/B uses nearest neighbor matching, Panel C local linear matching.

	Lending Relationships			
	Yes		No	
	Mean AISD for public firms (1)	Impact of being public (2)	Mean AISD for public firms (3)	Impact of being public (4)
Panel A: Nearest Neighbor Matching (100)				
Stratification by Size				
1 (lowest quartile)	124	-48**	159	-43**
	(61.674)	(9.600)	(129.214)	(12.412)
2	140	-40**	114	-51**
	(93.954)	(7.586)	(82.113)	(9.223)
3	96	-51**	103	-64**
	(72.231)	(8.360)	(127.047)	(17.047)
4	59	-57**	121	-17
	(54.557)	(8.201)	(118.202)	(13.067)
Panel B: Nearest Neighbor Matching (50)				
Stratification by Size				
1 (lowest quartile)	124	-40**	159	-35**
	(61.674)	(9.972)	(129.214)	(12.800)
2	140	-23**	114	-36**
	(93.954)	(8.070)	(82.113)	(9.944)
3	96	-28**	103	-46**
	(72.231)	(8.758)	(127.047)	(17.592)
4	59	-32**	121	-7
	(54.557)	(8.648)	(118.202)	(13.426)
Panel C: Local Linear Matching				
Stratification by Size				
1 (lowest quartile)	124	-50**	159	-31*
	(61.674)	(11.083)	(129.214)	(12.739)
2	140	-9	114	-35**
	(93.954)	(11.906)	(82.113)	(9.726)
3	96	-24**	103	-44*
	(72.231)	(7.505)	(127.047)	(17.458)
4	59	-55**	121	-10
	(54.557)	(6.712)	(118.202)	(13.276)

Significance levels : † : 10% * : 5% ** : 1%

TABLE 10
Information Opacity

This table reports results for the impact of alternative proxies of asymmetric information among public firms on loan spreads and the costs of being private. 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). We use 4 different proxies for information asymmetry and allow them to vary among public firms to assess the loan cost difference between public and private borrowers: (i) segment affiliation, (ii) analyst coverage, (iii) index membership and (iv) being among the Global Top 500 firms. 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. Columns (3) and (4) report results using analyst coverage as proxy of information asymmetry. No. Analysts is the number of analysts giving recommendations for the stock around the time the loan was issued. Public x High Analyst Cover is a dummy variable equal to one if the public firm has high analyst coverage. High coverage is defined as the upper quartile of the number of analysts. Public x Low Analyst Cover is a dummy variable equal to one if the public firm has low analyst coverage, respectively. Column (3) shows results only for the subsample of public firms. In Column (5), we use the information that a company does (not) belong to the Global Top 500 companies as information proxy. Global Top 500 is a dummy variable equal to one if the firm belongs to the Global Top 500 companies. We further report p-values of the tests that the differences between the coefficients of the interaction terms in columns (2), (4), and (5) are zero. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level.
(Continued on next page)

TABLE 10 (cont'd)

Panel A: Descriptive statistics of trading segments

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	1,200	268	2	4.29

Panel B: Regression results

Variable	(1) Only Publics	(2)	(3) Only Publics	(4)	(5)
FTSE 100/FTSE 250	-40.880**				
	(15.517)				
(1) Public x FTSE 100/FTSE 250		-53.959**			
		(12.201)			
(2) Public x Small Cap / AIM		-19.840			
		(22.262)			
No. Analysts			-.487		
			(0.516)		
(3) Public x High Analyst Cover				-45.361**	
				(13.580)	
(4) Public x Low Analyst Cover				-35.023**	
				(8.733)	
(5) Public x Global Top 500					-52.162**
					(16.131)
(6) Public x Not Global Top 500					-34.899**
					(8.944)
$(1)-(2)(p-value)$					
$(3)-(4)(p-value)$				0.2995	
$(5)-(6)(p-value)$					0.2294
N	403	1,240	940	1,730	1,764
R^2	63.74	37.60	48.86	38.51	38.35

Significance levels : † : 10% ∗ : 5% ∗∗ : 1%

TABLE 11
The Effect of Ownership Structure on Loan Spreads

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. In columns (4) and (5), we use the Herfindahl-Hirshman-Index (HHI) as a proxy of ownership concentration. We use the percentage share of the shareholders to calculate the HHI. We divide our sample of public firms into public firms with high and low ownership concentration and compare their loan spreads to spreads on loans to private firms. We define ownership concentration as follows: ownership concentration is high (low) if the HHI is above (below) 0.67. Public x HHI (Low) is a dummy variable equal to one if the public firm has low ownership concentration. Public x HHI (High) is a dummy variable equal to one if the public firm has high concentrated ownership. Private firms are the omitted group. Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level.

Panel B analyzes the impact of private equity ownership and/or governance on loan 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 an overview of these variables). PtP is a dummy variable equal to 1, if the deal is a public to private transaction. LBO/MBO is a dummy variable equal to 1 if the deal is an MBO or LBO (other than a public to private transaction). Private Equity (Not Buyout) is a dummy variable equal to 1 if the deal is private equity backed, but neither a PtP nor a LBO/MBO. Private Equity is a dummy variable equal to 1 if the deal is private equity backed (i.e. if either PtP, LBO/MBO or Private Equity (Not Buyout) equals 1). Standard errors (shown in parentheses) are heteroscedasticity robust, clustered at the firm level.
(Continued on next page)

TABLE 11 (Cont'd)

Panel A: Insider ownership concentration and loan spreads

Variable	(1)	(2) Only Publics	(3) Only Privates	(4) Only Publics	(5)
Public	-36.132**				
	(13.602)				
Owners	-0.465**	-0.548**	0.522		
	(0.169)	(0.148)	(2.607)		
HHI (High)				24.046*	
				(9.807)	
(1) Public x HHI (Low)					-53.276**
					(13.092)
(2) Public x HHI (High)					-37.396**
					(14.193)
N	1,063	560	503	560	1,059
R^2	35.76	52.12	24.29	55.31	37.81

Significance levels : † : 10% * : 5% ** : 1%

Panel B: Private equity ownership and loan spreads

Variable	(1)	(2)
Public	-26.432**	-28.35**
	(9.399)	(9.294)
(1) PtP	95.656**	
	(18.907)	
(2) LBO/MBO	76.303**	
	(18.010)	
(3) Private Equity (Not Buyout)	108.677**	
	(17.615)	
Public x Private Equity		16.446
		(17.047)
Private Equity		92.232**
		(14.556)
(1) – (2)	-13.02	
(1) – (3)	-32.37	
N	1,764	1,764
R^2	39.72	39.64

Significance levels : † : 10% * : 5% ** : 1%

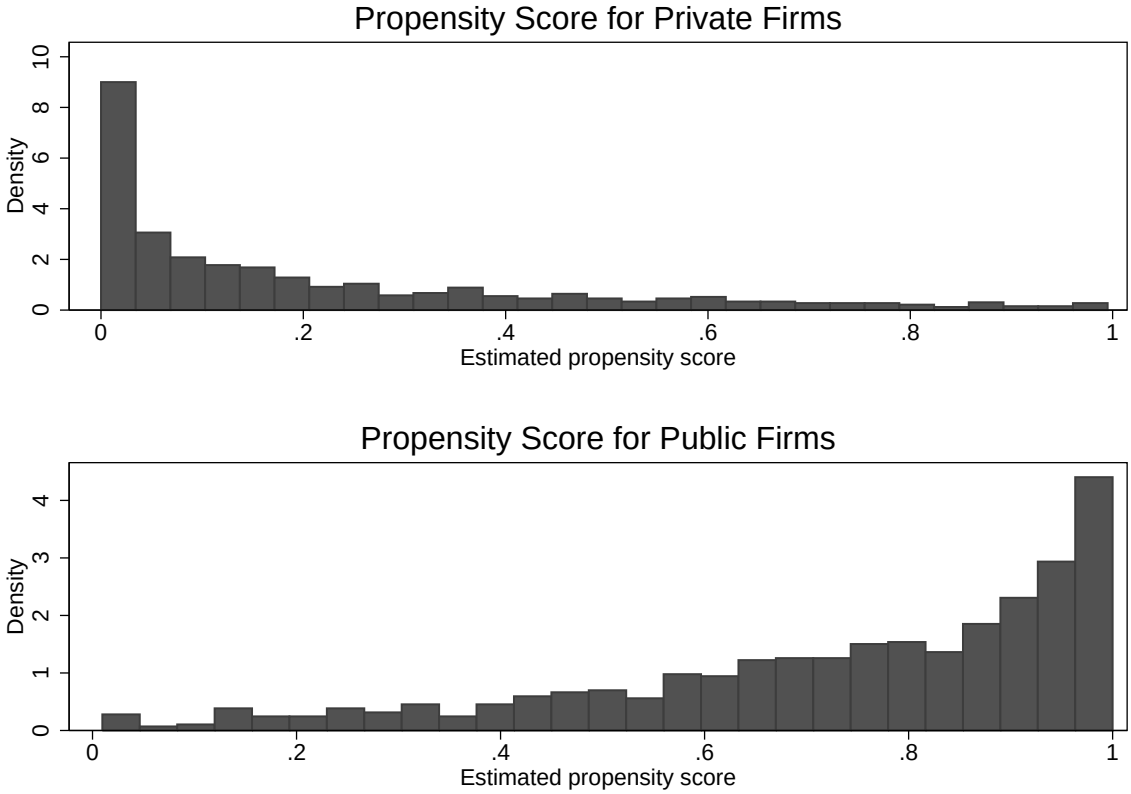

Figure 1: Histogram of Propensity Score

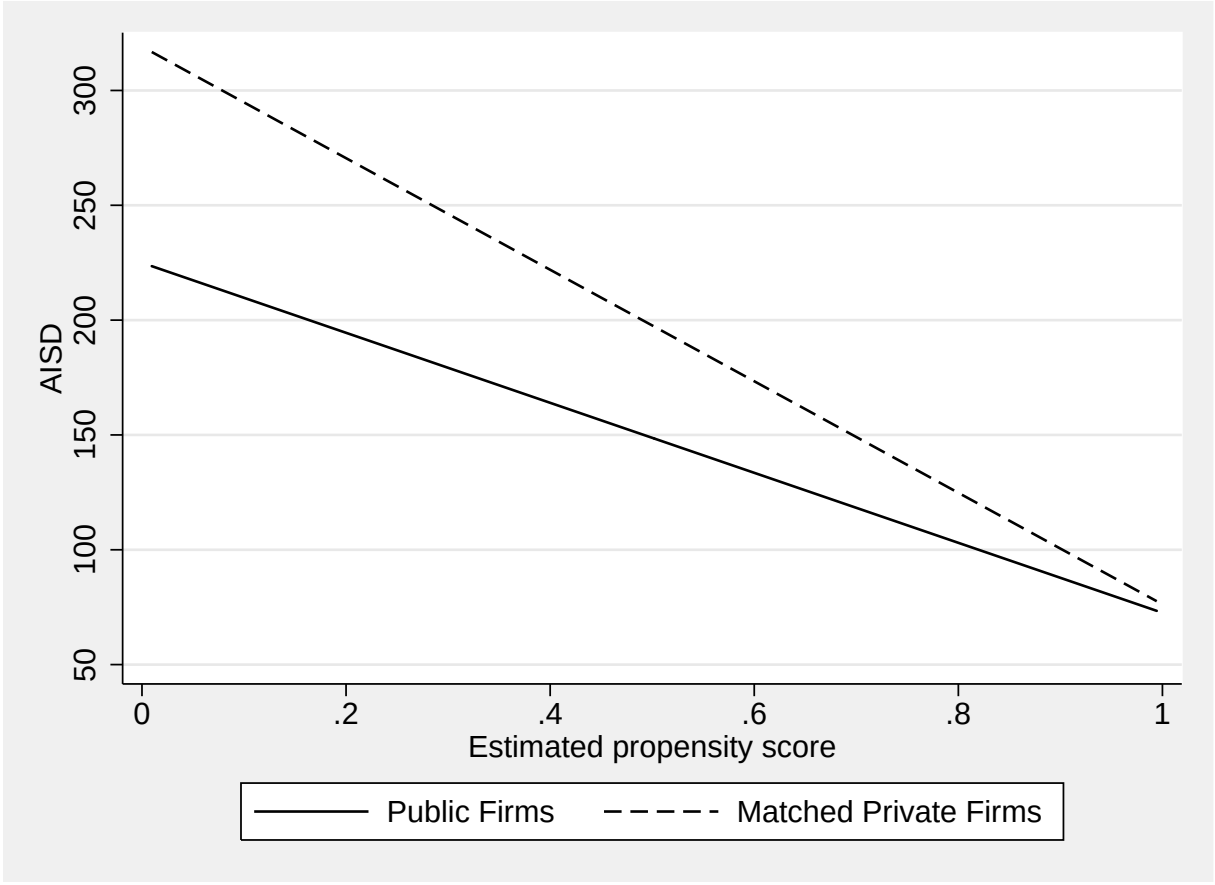

Figure 2: Loan Spreads as a Function of Propensity Scores Using Local Linear Matching

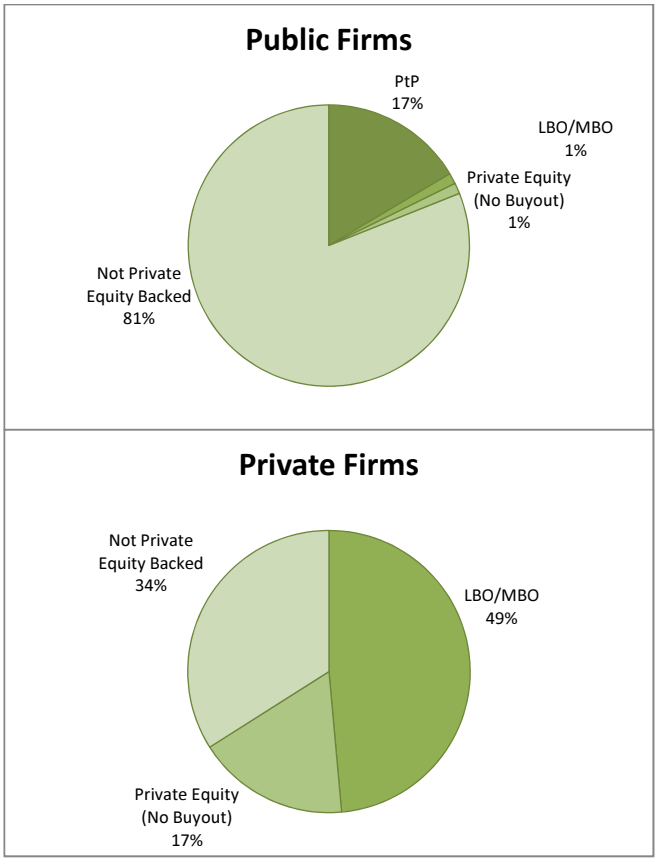

Figure 3: Private Equity Participation in Loan Deals for Public versus Private Firms