# The Choice between Project Financing and Corporate Financing: Evidence from the Corporate Syndicated Loan Market

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## Abstract

This paper examines the pricing of project finance (PF) and non-project finance (non-PF) loans and examines the factors that influence the borrower's choice between project financing and corporate financing. Using a sample of 210,273 syndicated loans closed between 2000 and 2014, we find that PF and Non-PF loans are influenced differently by common pricing characteristics and that PF loans in the U.S. and W.E. are priced in segmented markets. Borrowers choose PF when they seek long-term financing and funding cost reduction. We find that transaction cost considerations, the financial crisis and country risk affect the financing choice. Our results document that publicly traded sponsors who prefer project financing to corporate financing are larger, less profitable, more financially distressed and have a higher asset tangibility. Finally, privately held firms that choose off-balance sheet financing are smaller and less profitable and use PF to raise relatively larger amounts of debt.



Key words: project finance, syndicated loans, loan pricing, debt financing choice.
JEL classification: F34; G01; G21; G24; G32

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## 1. Introduction

Corporate financial structure encompasses not only the choice between debt and equity financing, but a number of contractual features. Within the class of debt securities, corporates typically make another choice, mainly public versus private debt. Furthermore, a corporate also has the choice to borrow on-balance sheet or off-balance sheet through the creation of a special purpose entity as in, e.g., a project finance transaction.[1] Prior research on firms' debt financing choice discusses, among others topics, the choice between bank financing and bond financing.[2] Albeit, this literature makes predictions about the relationship between debt source preferences and firm characteristics, such as size, age, leverage, liquidity, growth opportunities, and profitability, it has devoted little attention to the choice between project finance loans and corporate finance loans. Thus, the question arises *what factors determine the choice between project financing and corporate financing structures?*

Project finance is a form of financing based on a standalone entity created by the sponsors, with highly levered capital structures and concentrated equity and debt ownerships. Due to its contractual idiosyncrasies it is also used to segregate the credit risk of the project from those of its sponsors so that lenders, investors, and other parties will appraise the project strictly on its own economic merits.[3] Typically used for funding public and private capital-intensive facilities and utilities – such as power plants, refineries, toll roads, pipelines, industrial plants, and telecommunications facilities –, project finance is an economically significant growing financial market segment, but still largely understudied. Esty and Sesia (2007) report that a record $57.8 billion in project finance funding was arranged in Western Europe (W.E.) in 2006, which compares with $35.0 billion invested in the U.S. – a record $328 billion in project finance funding was globally arranged in 2006, a 51.2% increase from the $217 billion reported for 2001. In 2014, $54.1 billion and $60.2 billion were arranged in W.E. and the U.S., respectively – $260 billion arranged worldwide during 2014. According to Thomson Reuters, in comparison with other financing mechanisms in W.E. as well as in the U.S., the project finance market was smaller than both the corporate bond and the asset securitization markets in 2014. However, the amount invested in project finance was larger than the amounts raised through IPOs or venture capital funds.

Considering that project finance is a form of financing with highly levered capital structures – according to Esty (2004b), project companies' average book value debt-to-total capitalization ratio is

[1] Project finance transactions are structured via the transfer of a subset of firms' assets (an 'activity') into a bankruptcy-remote corporation or other special purpose vehicle (SPV); i.e., the assets instrumental to managing the project are separated from the remaining assets of the parties that create the vehicle.

[2] See, e.g., Diamond (1991b), Chemmanur and Fulghieri (1994), Houston and James (1996), Johnson (1997), Krishnaswami, Spindt, and Subramaniam (1999), Cantillo and Wright (2000), Denis and Mihov (2003), and Altunbas Alper, and Marqués-Ibáñez (2010).

[3] For further discussion, see Brealey, Cooper, and Habib (1996), Kleimeier and Megginson (2000), Esty (2003, 2004a, 2004b), Caselli and Gatti (2005), Fabozzi, Davis, and Choudhry (2006), Blanc-Brude and Strange (2007), Gatti (2008), and references therein.

70% –, funded with small amounts of private equity contributions and much larger amounts of nonrecourse syndicated loans,[4] the corporate syndicated loan market is a very fruitful field for analyzing the choice between project financing and corporate financing structures.

The extant literature on structured finance [Finnerty (1988), Caselli and Gatti (2005), and Fabozzi *et al.* (2006)] suggests two core economic motivations for originating a financing transaction under a project finance model. The first relates to the fact that it enables the financing of a particular asset class when established forms of external finance are unavailable for a particular financing need. The second economic benefit is a reduction in funding costs; i.e., making use of a transaction that is specifically structured using an SPV and is secured by ring-fencing assets producing cash flows solely for supporting the transaction, reduces the cost of funding. According to Brealey *et al.* (1996), Esty (2003, 2004a, 2004b), and Corielli, Gatti, and Steffanoni (2010), project finance creates value and thus reduces funding costs by resolving agency problems, reducing asymmetric information costs, and improving risk management.

If project finance transactions allow the reduction of funding costs when compared with traditional sources of funds, then the rates charged on project finance loans should be lower than the rates charged on non-project finance loans. Due to the difference in underlying risks, the relevant pricing characteristics for these two types of debt instruments should also differ. This raises three questions: (1) *How do spread and common pricing characteristics compare between project finance loans and other (non-project finance) syndicated loans*? (2) *Is the spread on project finance loans significantly lower than the spread on other syndicated loans*? And (3) *To what extent are project finance loans and other syndicated loans priced by common characteristics*?

Empirical evidence [Carey and Nini (2007)] suggests that the corporate syndicated loan market is not globally integrated; offering evidence that spreads and pricing characteristics are different in Europe and the U.S. This raises one last question: *are project finance loans financed in integrated debt markets (W.E. versus the U.S. and W.E. internally)?*

Finally, answering our questions, whilst taking into consideration the impact of the 2007-2008 financial crisis on the project finance market, would help establish whether our interpretations on the economic efficiency gains of project financing *vis-à-vis* corporate financing are appropriate.

To compare the financial characteristics of project finance loans to those of non-project finance loans and examine which factors may explain the choice between project financing and corporate financing, we use a dataset including a comprehensive sample of syndicated loans closed between January 1, 2000 and December 31, 2014. Our sample contains information about 10,950 project finance loans (5,935 project finance deals worth $2,108.8 billion) and 199,323 (129,256 non-project finance deals worth $40,592.6 billion) non-project finance loans.

[4] Syndicated loans are the prominent form of funding for project-financed investments. As asserted by Esty and Megginson (2003), 'lending syndicates resemble pyramids with a few arranging banks (arrangers) at the top and many providing banks (providers) at the bottom.'

We find that most of the common pricing characteristics differ significantly between project finance and non-project finance loans. Univariate analysis shows that project finance transactions are most commonly used for capital-intensive facilities and utilities in riskier than average countries, using relatively long-term financing.

Regression analyses reveal that project finance loans and other syndicated loans – corporate control loans, capital structure loans, fixed asset based loans, and general corporate purpose loans – are debt instruments influenced differently by common pricing characteristics. Our results support hypotheses of project finance as a mechanism of reducing the cost of funding by overcoming agency conflicts and asymmetric information problems and improving risk management. *Ceteris paribus*, project finance loans are associated with lower spreads than other syndicated loans. Our results also indicate that project finance loans in the U.S. and W.E. are priced in segmented markets and that those in W.E. are associated with lower spreads: project finance loans extended to U.S. borrowers are associated with a statistically significant 85.2 bps increase in spread. Finally, we document that the 2007-2008 financial crisis and the subsequent European sovereign debt crisis significantly impacted PF loan spreads and pricing processes: spreads increased significantly and bank liquidity and sovereign risk became important credit spread determinants during the crisis period.

Our results regarding publicly traded firms' choice between project financing and corporate financing support hypotheses of project financing as a mechanism of overcoming agency conflicts between borrowers and lenders, but provide mixed evidence concerning the relevance of project finance in reducing deadweight costs from asymmetric information problems. We find that sponsors choose project finance transactions when they seek long-term financing and want to maintain financial flexibility and protect their credit standing. Furthermore, firms employing project financing over corporate financing are larger and more financially constrained; they also have higher asset tangibility and operate in countries with lower sovereign debt ratings. Finally, firms prefer project financing when issuing relatively lower amounts of debt and are less profitable.

Regarding privately held firms, our results support the asymmetric information hypothesis: W.E. sponsors choose project financing when they are relatively smaller and seek long-term financing. Our results document that firms choose project finance transactions for relatively large amounts of debt to economize on scale. In addition, firms employing project financing over corporate financing are less profitable and operate in countries with lower sovereign debt ratings. Finally, U.K. borrowers positively affect the probability of observing a project finance loan rather than a non-project finance loan.

For both public and private sponsors, we document that firms which employ both project finance and corporate finance lending within our sample period are more likely to choose project finance loans when issuing new debt and the 2007-2008 financial crisis and the subsequent European sovereign debt crisis increases the probability of choosing project finance over other syndicated loans in W.E.

The paper extends the literature in several ways. Firstly, as to the best of our knowledge, our study is the first to examine the factors underlying firms' choice between project finance loans and corporate finance loans; i.e., between off-balance sheet and on-balance sheet funding. Secondly, we empirically explore the debt choice using a unique dataset of loans carefully assembled and hand-matched from multiple databases. Thirdly, we model the self-selection of firms' choice between project finance loans and other syndicated loans and show the different pricing schemes between the two classes of debt. We also contribute to both corporate finance and financial intermediation literature. We extend Carey and Nini's (2007) work providing evidence that project finance loans differ significantly across Europe and the U.S., both in terms of spreads and common pricing characteristics. Finally, we study the impact of the 2007/2008 crisis on the debt choice and pricing processes.

The rest of the paper is organized as follows. In the next section, we discuss the project finance theoretical and empirical background, and the interconnections with debt choice literature. Section 3 describes the Dealscan, Datastream and Orbis databases used in this study as well as the financial characteristics for the samples of syndicated loans. Section 4 examines the determinants of credit spreads. We begin by presenting the methodology and analyzing the extent to which project finance loans and other syndicated loans are priced in segmented or integrated loan markets. In this section, we also analyze the extent to which project finance loans are priced by common factors in W.E. internally, in W.E. *vis-à-vis* the U.S., in different industries, and in the pre-crisis *versus* the crisis period. In section 5, descriptive statistics of public and private firm characteristics, as well as the determinants of firms' financing choice are presented. Section 6 summarizes the paper.

## 2. Literature review

### *2.1. The financial economics of project finance*

To understand the motivation for using project finance, a thorough understanding is needed of why the combination of a firm plus a project might be worth more when financed separately with nonrecourse debt – project financing – than when they are financed jointly with corporate funds – corporate financing. Brealey *et al.* (1996) argue that project finance creates value by resolving agency problems and improving risk management. Esty (2003, 2004a, 2004b) takes a more general view of the problem and presents four primary reasons for using project finance. Firstly, project finance can be used to mitigate costly agency conflicts – agency cost motivation – inside project companies and among capital providers. Secondly, this type of transaction allows companies with little spare debt capacity to avoid the opportunity cost of underinvestment in positive NPV projects – debt overhang motivation. According to Nevitt and Fabozzi (2001), Gatti (2008), and Fabozzi *et al.* (2006), the off-balance sheet treatment of the funding raised by the SPV is crucial for sponsors since it only has limited impact on sponsors' creditworthiness, and does not impact sponsors' ability to access additional financing in the future. Thirdly, project finance improves risk management – risk

management motivation. The nonrecourse nature of project debt protects the sponsoring firm from risk contamination. Additionally, risks are allocated inside the project with the goals of reducing cost and ensuring proper benefits. Finally, project finance can also help to reduce underinvestment due to asymmetric information problems – asymmetric information motivation.

Despite the referred advantages, it is possible to identify in the extant literature [e.g., Esty (2004a,b), Fabozzi *et al.* (2006), Gatti (2008), and Bonetti, Caselli, and Gatti (2010)] the following main problems related to the use of project finance: (*i*) complexity – in terms of designing the transaction and writing the required documentation; (*ii*) higher costs of borrowing when compared to conventional financing; and (*iii*) the negotiation of the financing and operating agreements is time-consuming. As pointed out by Esty (2004a), a project finance transaction is expensive to set up, it takes a long time to execute, and it is highly restrictive once in place. Similarly, Gatti (2008) refers that the principal drawback of project finance is that structuring such a deal is costlier than the corporate financing option. Although these counter-intuitive features of project finance when compared to corporate financing, Esty (2004b) and Bonetti *et al.* (2010) refer that in practice the additional costs are more than compensated for by the advantages that arise from the reduction in the net financing costs associated with large capital investments, off-balance sheet financing, and appropriate risk allocation.

*2.2. Determinants of firms' debt choices*

To date, explanations of firms' external debt funding sources choice has focused, mainly, on the choice between public and private debt. While some authors argue that bank financing have a significant advantage over bond financing [Diamond (1984), Boyd and Prescott (1986), Berlin and Loyes (1988), and Chemmanur and Fulghieri (1994)], Diamond (1991b) and Rajan (1992) predict a hump-shaped relationship between firm quality and debt source, i.e., highest-quality firms will issue public debt, medium-quality firms will borrow from banks, and low-quality firms will issue public debt because the cost of bank monitoring outweigh the benefits.

Empirically, Houston and James (1996), Johnson (1997), Krishnaswami *et al.* (1999), Cantillo and Wright (2000), Denis and Mihov (2003), and Altunbas *et al.* (2010) document the relationships between the use of public bonds and firms' characteristics. Johnson (1997) reports evidence of the systematic use of bank debt by firms with access to public debt markets, which suggests that the benefits of bank debt remain important for those firms. Cantillo and Wright (2000) and Denis and Mihov (2003) show that the major determinant of the debt source is the credit quality of the issuer. According to Cantillo and Wright (2000), higher quality firms prefer public debt, while firms with poor prospects borrow from banks. Considering the choice among bank debt, non-bank private-debt, and public debt, Denis and Mihov (2003) argue that firms with higher credit risk prefer non-bank private sources, while firms with credit rating towards the middle of the spectrum borrow from banks, and those with the highest credit rating prefer public debt. Cantillo and Wright (2000), Esho, Lam and Sharpe (2001), Denis and Mihov (2003), and Fiore and Uhlig (2011)], following the renegotiation and

liquidation hypothesis, argue that borrowers with a higher probability of financial distress are far less likely to borrow publicly. Finally, based on the information asymmetry hypothesis, Krishnaswami *et al.* (1999), Denis and Mihov (2003), and Fiore and Uhlig (2011) suggest that firms facing higher incentive problems arising from information asymmetries are expected to borrow privately.

Albeit, this literature makes predictions about the relationship between debt source preferences and firm characteristics, they paid little attention to the choice between off-balance sheet financing via project finance loans and on-balance sheet financing via corporate finance loans, though.

## 3. Data description

### *3.1. Sample selection*

Our sample consists of individual loans extracted from Dealscan and covers the 2000-2014 period. Dealscan provides individual deal information on the global syndicated loan markets. Information is available on the micro characteristics of the loans (e.g., deal and loan size, maturity, currency, pricing, rating, type of interest rate) and of the borrowers (e.g., name, nationality, industry sector).

Although the database extracted from Dealscan contains detailed historical information about syndicated loans and related banking instruments, we have excluded deals with no loan (facility) amount or deal amount available, deal status not closed or completed and loans with the purpose classified as Collateralized Debt Obligation and Guarantees, as they are not relevant to the purpose of our study. A close analysis of our data indicated the existence of some extreme values for the all-in-spread-drawn and deal amount variables. We have trimmed these two variables at the 1% top and bottom percentiles. We then deleted all observations with no deal amount available, as it is a critical variable for all of our tests. These screens have yielded a full sample of 10,950 project finance (PF) loans (worth $2,108.8 billion) and 199,323 (worth $40,592.6 billion) non-project finance (non-PF) loans. This sample represents almost 90% of the global syndicated lending between 2000 and 2014 – according to Thomson Reuters, global syndicated lending reached $48,082.8 billion during this period. As the unit of observation is a single loan tranche, multiple issues from the same transaction appear as separate observations in our database – PF loans typically consist of several tranches funding the same project company. Therefore, we focus on the transaction tranches or loans as our basic observation.

In order to analyze what factors determine the choice between project financing and corporate financing structures, we need to collect firm specific accounting and market data. Dealscan includes data on both private and public firms. For our analysis, we complemented Dealscan data with Orbis (private firms) and Datastream (public firms) data. As Dealscan database does not provide an identification code we hand-matched those sponsors with a controlling stake in the equity of the separate PF company with Datastream and Orbis by using the sponsor name. For non-PF loans, data

from Datastream and Orbis is merged with loan information from Dealscan by hand-matching borrowers' names. This method allows the deals to be matched with the ultimate party responsible for the decision of the financing choice between project financing and corporate financing.[5]

Finally, data on macroeconomic variables, such as the level of interest rates, market volatility, and slope of the yield curve, was obtained from Datastream. We linked the macroeconomic variables and the microeconomic information contained in the loans on the active date of each loan.

*3.2. Contractual characteristics of project finance loans versus non-project finance loans*

Table 1 presents basic contractual characteristics for the full sample of PF loans and four additional, non-overlapping samples of non-PF syndicated loans classified by loan type. The category *corporate control loans* includes those loans with a primary purpose that indicates they are being arranged to fund acquisitions, leveraged buyouts, management buyouts, mergers, and employee stock ownership plans. *Capital structure loans* are those arranged for refinancing, recapitalizations, debt repayment, standby commercial paper facilities, securities purchase, and debtor in possession financing. *Fixed asset based loans* have a loan primary purpose indicating they are intended for mortgage lending or to fund purchases of aircraft, property, shipping, hardware, or telecom facilities. Finally, *general corporate purpose loans* are those arranged for corporate purposes, capital expenditures, trade finance, working capital, as well as credits with an empty loan primary purpose description. This categorization strategy follows the one presented by Kleimeier and Megginson (2000) and allows loans with similar corporate purposes to be grouped together. It also provides non-PF sub-samples that can be compared not only with PF samples but also to each other. Additionally, the method of categorizing non-PF loans is not critical to our main empirical objective in this section, which is to test both whether PF and non-PF loans are significantly different financial instruments and what factors determine the choice between project financing and corporate financing structures.

****** Insert Table 1 about here ******

Table 1 presents significant differences both between PF and non-PF loans, as well as between the various categories of traditional loans. One of the most interesting findings is how much larger corporate control and capital structure loans are than other loan types. These credits have mean (median) values of $254.2 million ($70.0 million) and $253.8 million ($100.0 million), respectively, compared with $198.4 million ($71.5 million) for general purpose loans and only $117.8 million ($63.5 million) for fixed asset based loans. PF loans – with a mean (median) of $192.1 million ($74.7

[5] Matching Dealscan with Datastream and Orbis databases is a complex process. The main identifier in Dealscan database is the firm's name. For a much smaller sample, Dealscan also presents the firm's ISIN and Ticker. When available, we have used all these identifiers to match with Datastream. For those cases without an ISIN or Ticker it was impossible to classify the firms as public or private. We start by assuming they could be public and run a complex matching algorithm based on the name and we then manually validate the results keeping pairs of firms that presented a very high matching score. For the remaining unmatched firms, we then attempt to match them as private firms, applying the same approach. Our matching procedure is very conservative, as we keep only matches that we consider to be of low risk, ignoring matches that are not unique and matches that we cannot be certain are in fact the same company.

million) – are, on average, $62.2 million smaller than corporate control loans, but $74.2 million higher than fixed asset based loans. These differences remain even when size is expressed by the total value of a deal rather than as individual loans. Our results are generally in line with those presented by Kleimeier and Megginson (2000) for the 1980-1999 period.

The average maturity of PF loans, 11.4 years, is more than twice that of the non-PF loan sub-samples. Regarding fixed asset based loans, our results are contrary to those of Kleimeier and Megginson (2000), which found a similar average maturity between these types of syndicated loans and PF loans (8.1 years versus 8.6 years, respectively). Perhaps the most remarkable difference between PF and non-PF loans is how infrequently PF loans are extended to U.S. borrowers. Whereas U.S. corporations arrange 33.0% of capital structure loans – the lowest percentage by value –, and fully account for 51.3% of corporate control lending, U.S. borrowers account for a mere 11.3% of project finance lending. On the contrary, W.E. borrowers use PF loans very often to fund their investment projects; i.e., W.E. corporations arrange 33.0% of PF loans, which compares with 32.9% for corporate control loans, 20.1% for capital structure loans, 15.1% for fixed asset based loans, and 14.6% for general corporate purpose loans.

A significantly larger fraction of PF loans are fixed rate (25.8%) compared to the full sub-samples of non-PF loans. Compared to non-PF sub-samples, PF loans involve, on average, 5.2 banks in the deal syndication, which is higher than that for fixed asset based loans, but lower than the number of banks for the remaining loan categories. According to the loan type, syndicated loans are substantially different financing instruments. Term loans represent almost 93% of PF loan sample, whereas in corporate control, capital structure and general corporate purpose samples, the weight of credit lines in the total loans is significantly higher. The only other category of loans with a similar loan type composition are fixed asset based loans, in which term loans represent 87.3% of the total loans.

*3.3. Loan pricing samples*

As we aim to study if PF transactions allow the reduction of funding costs, and to model the self-selection of firms' choice between PF loans and non-PF syndicated loans and show the different pricing schemes between the two classes of debt, we have selected from our full sample those issues that have complete data on spread.[6] This screen has yielded a "high-information" sub-sample of 109,049 loans (worth $14,573.6 billion), of which 3,510 (worth $875.7 billion) have been classified as PF loans, 23,406 as corporate control loans (worth $5,962.4 billion), 19,370 as capital structure loans (worth $5,650.9 billion), 4,967 as fixed asset based loans (worth $520.9 billion), and 57,796 as general corporate purpose loans (worth $14,572.6 billion).[7]

[6] We use the issuance credit spread or the tranche spread at closing. Kleimeier and Megginson (2000), Gabbi and Sironi (2005), Blanc-Brude and Strange (2007), Sorge and Gadanecz (2008), and Gatti, Kleimeier, Megginson, and Steffanoni (2013) among others, use the same variable.

[7] A comparison of the common variables in the full samples and in the high-information samples reveals that the high-information issues are not dissimilar to their counterparties.

Table 2 provides descriptive statistics for our high-information samples of PF and non-PF loans between 2000 and 2014.

****** Insert Table 2 about here ******

*Spread* represents the spread paid by the borrower over Libor plus the facility fee (all-in-spread-drawn). For syndicated loans, the all-in-spread-drawn (AISD) does not represent the full economic cost of credit, as additional fees, such as commitment fees and up-front fees, are typically charged. As an alternative to the AISD, Berg, Saunders, and Steffen (2015) propose the 'total-cost-of-borrowing' (TCB), which accounts for fees and spreads. Considering that we can only compute a TCB measure for term loans and that the information provided by Dealscan regarding up-front fees is scant, we verify a significant reduction in our high-information sample from 109,049 to 15,689 observations. The TCB is 45.97 bps higher than the spread for this syndicated loans' sub-sample. We thus use the spread as our credit spread measure in both statistical and econometric analyses and perform robustness checks using the TCB, rejecting the hypothesis that the spread is identically distributed for PF and non-PF loans. When assessing spread differences across syndicated loan categories, we find that while mean spread is lower for corporate PF loans (224.0 bps) than corporate control loans (312.7 bps) and general corporate purpose loans (228.3 bps); spreads are lower for both fixed asset based loans (194.0 bps) and capital structure loans (220.1 bps) than for PF loans. Still, these univariate analyses do not allow us to control for other factors that are known to affect the pricing of syndicated loans. Thus, in order to further test if the spread on PF loans is significantly lower to the spread on non-PF loans we proceed, in section 4, with a regression analysis that takes micro and macro pricing factors directly into account.

*Rating* evaluates the capacity of the borrower to repay interest and principal on time as promised. We use a rating classification scheme based on 22 rating scales for two rating agencies. Loan ratings are thus based on the S&P and Moody's rating at the time of closing the loan, and converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22 [Sorge and Gadanecz (2008) and Gatti *et al.* (2013)]. *Country risk* is approximated by Standard & Poor's country credit rating at the time of closing the loans. This variable measures from 1 for the countries with the lowest risk (AAA=1) to 22 for the countries of highest risk (D=22). PF loans average rating (10.0) is significantly higher than that of capital structure loans (8.6) and general corporate purpose loans (8.9). In contrast, rating for PF loans and corporate control loans (9.5) and for PF loans and fixed asset based loans (9.6) is not significantly different at the 10 percent level. This suggests that PF transactions may be inherently riskier than both capital structure and general corporate purpose loans. However, it can also reflect the country risk rating as PF borrowers are, on average, located in far riskier countries than borrowers of non-PF syndicated loans. However, the small number of PF loan observations (N=16) for rating undermines in-depth analysis.

The mean (median) PF deal size of $450.9 million ($204.2 million) is significantly more than the fixed asset based and general corporate purpose loans mean (median) deal size of $133.5 million

($72.6 million) and $356.0 million ($155.0 million), respectively. On the contrary, mean (median) capital structure loans deal size of $493.0 million ($225.0 million) significantly exceeds that of PF. However, the difference in deal size between PF loans and corporate control loans is insignificant. Regarding loan size, PF loans exhibit lower mean (median) tranche size of $234.0 million ($100.0 million) than corporate control, capital structure, and general corporate purpose loans, but higher than fixed asset based loans $104.0 million ($58.8 million). Thus, we can conclude that PF deals are not abnormally large financing vehicles, but rather fall well within the mainstream of syndicated lending.

For PF loans, the average loan size-to-deal size ratio is 53.7%, which significantly exceeds that of corporate control loans (41.8%). We also find that loan size-to-deal size ratio is economically and statistically lower for PF loans than for capital structure (58.8%), general corporate purpose (70.3%), and fixed asset based (78.2%) loans. These results can be explained by the fact that PF transactions typically include a much larger number of tranches than non-PF loans; an average PF transaction includes 2.1 tranches while average capital structure, fixed asset based, and general corporate purpose transactions have 1.7, 1.3, and 1.4 tranches, respectively. Thus, we conclude that with the exception of corporate control loans (with an average of 2.5), PF transactions benefit more from tranching.

An average PF loan matures over 10.9 years, which is more than twice that of the non-PF loan sub-samples. In contrast to traditional syndicated loans in which repayment capacity stems from the issuer's ability to generate sufficient cash flows, PF loan repayment prospects depend primarily on the SPV assets and cash flows. Therefore, PF loan maturities typically reflect maturities of the projects implemented by the SPV, which tend to be longer term.

For PF loans, the average number of participating banks is 7.1, which is significantly larger than the corporate control (6.5), fixed asset based (4.1), and general corporate purpose (6.6) loans average, but smaller than the capital structure loans average (8.6). This is consistent with the view that banks attempt to maximize the number of PF participants to spread out risk.

The variable *number of covenants* suffers from a missing value problem (an empty cell may mean that the loan has no covenants or that the data is unavailable). We thus report it simply as the number of covenants for loans in which the loan agreement legally imposes any of the standard positive or negative covenants on the borrower. Surprisingly, the average number of covenants in a PF loan (1.9) is significantly smaller than in any other type of syndicated loan. The separate corporation feature of PF can explain this, which is central for its logic. Additionally, in PF transactions lenders rely upon the network of nonfinancial contracts as a mechanism to control agency costs and project risks [Corielli *et al.* (2010)]. Since loan covenants are designed to protect the creditor mainly for asset substitution and other procedures of wealth expropriation by the borrower, the contractual clauses are far less necessary for loans to an SPV company than they are for loans made to a standard corporation.

The observed level of loan fees do provide indirect evidence that PF lending may well be considered more difficult to arrange – or that in PF loans spreads and fees are complements rather than substitutes. With the exception of corporate control loans, the mean levels of upfront fees and commitment fees for PF loans (86.3 bps and 44.2 bps, respectively) are significantly higher than the levels for the remaining non-PF loan samples. These findings suggest that banks must be compensated with relatively high up-front payments to entice them to participate in PF lending, and they are apparently unwilling to take as large a stake in PF loans as they would in other credits. Regarding commitment fee, we only have information (fee paid on the unused amount of credit line commitments) for 17 PF loans, which does not allow for an in-depth analysis. This can be explained by the fact that PF loans are very frequently closed as term loans (88.8%), rather than non-PF loans.

Fixed interest rates are an important distinguishing characteristic of PF loans; 16.8% of our PF high-information sample has fixed rates compared with 15.2% of capital structure loans, 14.4% of fixed asset based loans, 6.0% of general corporate purpose loans, and 3.2% of corporate control loans. Currency risk – a loan has currency risk if the denomination of the loan differs from the currency of the borrower's home country – varies significantly between PF and non-PF syndicated loans. Non-PF loans are less likely to bear currency risk than PF loans (32.4%). Given the non-U.S. nature of typical PF borrowers, coupled with the fact that syndicated loans are frequently dollar-denominated, this high level of currency risk is not surprising.

As for our full sample, PF loans are very infrequently extended to U.S. borrowers when compared to non-PF loans. Whereas U.S. corporations arrange 72.4% of general corporate purpose loans, 62.2% of fixed asset based loans, 61.6% of corporate control loans, and 47.7% of capital structure loans, U.S. borrowers account for a mere 20.1% of PF lending. On the contrary, W.E. borrowers very often use PF loans; W.E. corporations arrange 34.5% of PF loans, which compares with 30.0% for corporate control loans, 23.1% for capital structure loans, 8.9% for fixed asset based loans, and 10.5% for general corporate purpose loans.

Perhaps the most significant difference between PF loans and other types of syndicated loans is how infrequently PF loans are issued by sponsors in the financial institutions industry (only 0.3%). This makes sense as banks are primarily lenders rather than sponsors in the PF market.

In short, our results indicate that the common pricing characteristics differ significantly in value between PF and non-PF loans. Additionally, our univariate analyses confirm that PF transactions are most commonly used for capital-intensive facilities and utilities with relatively transparent cash flows, in riskier than average countries, using relatively long-term financing.

**4. Cost of funding and borrower's choice**

In this section, we begin to examine what factors affect a firm's choice to issue one loan type over another. First, we wish to determine which of the variables have significant and independent effect on spreads once the effects of other variables are accounted for. Considering that recent

research [Kleimeier and Megginson (2000) and Sorge and Gadanecz (2008)] suggest that PF loans are fundamentally different from other debt instruments due to the difference in underlying risks, we hypothesize that relevant pricing factors and pricing processes for these two types of debt instruments should also differ. Thus, we start our analysis by determining if PF loans and non-PF loans are priced in the same way, which is equivalent to testing whether PF loans and other syndicated loans are priced in segmented or integrated debt markets. Second, extant literature on structured finance [Finnerty (1988), Caselli and Gatti (2005), and Fabozzi *et al.* (2006)] and project finance [Brealey *et al.* (1996), Esty (2003, 2004a, 2004b), and Corielli *et al.* (2010)] leads us to hypothesize that PF transactions reduce funding costs. To test this hypothesis, we subject our overall sample of syndicated loans to OLS regression analysis in order to determine whether PF loans are more or less expensive than non-PF loans, after controlling for other micro and macro pricing factors.

Third, we analyze not only if PF loans in W.E. and the U.S. are priced in integrated debt markets but also if PF loans extended to W.E. have lower spreads than those arranged for U.S. borrowers. Fourth, we expand the OLS model to account for self-selection between project financing and corporate financing in W.E. and the U.S. and study what are the main determinants of PF loan spreads in these two regions. Finally, we examine whether the 2007-2008 financial crisis and the subsequent European sovereign debt crisis significantly impacts PF loan spreads and financing choices.

We employ OLS regression techniques and adjust for heteroskedasticity. As we use a sample of loan-level observations, we can expect that the standard errors for loans belonging to the same deal are correlated with each other. We thus estimate standard errors clustered by deal. The specification of the initial model is:

$$\begin{aligned} Spread_i = {} & \alpha_0 + \beta_1 Maturity_i + \beta_2 Number\ of\ banks_i + \beta_3 Deal\ size_i + \beta_4 Distribution\ method_i \\ & + \beta_5 Seniority_i + \beta_6 Loan\ size\ to\ deal\ size_i + \beta_7 Crisis_i + \beta_8 Term\ loan_i + \beta_9 Currency\ risk_i \\ & + \beta_{10} Rated_i + \beta_{11} Rating * rated_i + \beta_{12} Country\ risk_i + \beta_{13} Volatility_i + \beta_{14} Risk\ free\ rate_i \\ & + \beta_{15} 5yTB - 3mTB_i + \beta_{16} Fixed\ rate_i + \varepsilon_i \end{aligned} \quad (1)$$

A Chow test for a structural break is used to investigate whether the credit spreads associated with PF and non-PF loans are influenced differently by common pricing factors. In essence, we are testing whether the pricing factors used in equation (1) are significant in both PF and no-PF loans and, if so, whether they have the same coefficient values. Results are presented in Table 3. As the Chow test statistics are all higher than the critical levels, we conclude that PF loans and other syndicated loans are debt instruments influenced differently by common pricing factors. Even when we create sub-samples for loans extended to U.S. or W.E. borrowers we find that PF loans and each of the four categories of non-PF loans are not priced in an integrated debt market.

****** Insert Table 3 about here ******

*4.1. Do project finance loans have lower spreads?*

If PF transactions facilitate lower funding costs by mitigating agency problems, reducing information asymmetries and improving risk management, spreads for non-PF loans should exceed that of PF loans. In order to examine whether the spreads on PF are lower than the spreads on non-PF loans we use equation (1) and create one dummy variable set equal to 1 if the loan is a PF loan (*Project Finance*), and 0 otherwise. We also control for industry, year and region fixed effects.

Column 1 of Table 4 reports estimates of this equation (model [1]) for a high-information sample of 101,738 syndicated loans (2,822 PF loans, 22,187 corporate control loans, 18,153 capital structure loans, 4,514 fixed asset based loans and 54,062 general corporate purpose loans).[8] The results suggest that PF loans are associated with lower spreads, holding other factors constant, since PF dummy variable is associated with statistically significant 42.1 bps drop in spread. Therefore, we conclude that the spread on PF loans is lower than the spread on otherwise comparable corporate financing loans. Our results remain unchanged when estimating our base model for sub-samples crated based on whether the borrower is located in the U.S., U.K., or W.E. Additionally, as we find that both annual fees and upfront fees are significantly and positively correlated with spreads for syndicated loans, which supports the idea that risk is priced jointly through spreads and fees,[9] we also use the TCB [Berg *et al.* (2015)] as an alternative to the spread – model [2]. Re-estimating model [1] using a sub-sample of 14,557 term loans with available information on up-front fees does not yield different results: PF loans are associated with lower borrowing costs.

****** Insert Table 4 about here ******

However, when re-estimating this model for each category of non-PF loans – models [1a], [1b], [1c] and [1d] –, separately, we find that whereas the spread on PF loans is lower than the spread on corporate control, capital structure and general corporate purpose loans, the *Project Finance* dummy variable is associated with a statistically significant 34.1 bps increase in spreads in model [1c], meaning that PF loans have higher spreads than fixed asset based loans. This can be explained by the fact that in a fixed asset based loan the asset is explicitly given as a guarantee to lenders, which significantly reduces the syndicated loan loss given default. In order to examine if these results are robust, we check further whether they are affected by the country where the borrower is located. Table 5 reports estimates of re-estimating models [1a], [1b], [1c] and [1d] for two sub-samples created according to whether the borrower belongs to the U.S. or W.E. Results show that (*i*) PF loans are associated, holding other factors constant, with lower spreads than corporate control, capital structure, and general corporate purpose loans; and (*ii*) whereas for loans extended to U.S. borrowers, the spread

[8] In this section, we do not distinguish between a firm's attributes because of the significant sample size reduction that it would impose. *N* would decline from 101,738 to 34,712 observations.

[9] These findings are consistent to those presented in Blanc-Brude and Strange (2007), Gatti *et al.* (2013), and Berg *et al.* (2015).

on PF loans and fixed asset based loans do not differ significantly, PF dummy variable is associated with a statistically significant 20.7 bps drop in spreads for loans arranged for W.E. borrowers.

****** Insert Table 5 about here ******

Overall results support hypotheses of PF transactions as mechanisms for asymmetric information problem and principal-agent conflict reduction. PF reduces asymmetric information because it enables lenders to distinguish project performance from firm performance, monitor project management decisions, and determine the cash flow available for interest and principal repayment. It also reduces agency costs because the highly leveraged capital structures of PF play an important disciplinary role by preventing managers from wasting free cash flow, and deters related parties from trying to appropriate it.

Finally, PF also creates value by improving risk management inside the project; i.e., risks are allocated to the parties that are in the best position to manage them. Esty and Megginson (2003) and Corielli *et al.* (2010) refer to PF as 'contractual finance', a nexus of contracts between the players involved in such a deal.

*4.2. Pricing processes and borrower's choices in the U.S. and W.E.*

In the previous section, we document that project financing reduces funding costs *vis-à-vis* corporate financing and that this is true for both U.S. and W.E. borrowers. Carey and Nini (2007) show that corporate loan market is not globally integrated, offering evidence that spreads on syndicated loans are, on average, 30 bps smaller in Europe than in the U.S. Despite the fact that home bias might explain this pricing difference, the authors argue that their causes remain a puzzle, mainly because they found little evidence of convergence spreads during the sample period. In this section, we start by examining if PF loans made in the W.E. and U.S. markets may differ materially in terms of spreads and pricing determinants. Then, we focus on which factors affect PF loan spreads and a new borrower's choice between PF loans and non-PF loans in both markets.

*4.2.1. Are project finance loans in the U.S. and W.E. priced in integrated markets?*

In order to determine if PF loans in the U.S. and W.E. are influenced similarly by common pricing factors we used a Chow test for a structural break. The Chow test statistic of 6.2 exceeds its critical value, indicating that PF loans in the U.S. and W.E. are priced in segmented markets. Hence, PF loans are influenced differently by common pricing factors in these two regions and we cannot estimate the full sample of PF loans in a single regression when analyzing the pricing determinants of PF loan spreads in section 4.2.2.

Following Carey and Nini's (2007) findings, we expect spreads for PF loans extended to U.S. borrowers to exceed that of those extended to borrowers in W.E. In order to examine whether the spreads on PF are lower in the U.S. than in W.E. we use equation (1) and create one dummy variable set equal to 1 if the loan is extended to a U.S. borrower (*U.S. Borrowers*), and 0 otherwise. We also control for industry and year fixed effects.

Column 1 of Table 6 reports estimates of this equation (model [5]) for a high-information sample of 1,809 PF loans (655 and 1,154 loans extended to U.S. and W.E. borrowers, respectively). As we expected, the results suggest that PF loans in W.E. are associated with lower spreads, holding other factors constant, since *US* dummy variable is associated with statistically significant 85.2 bps increase in spread. Our results remain unchanged when estimating our model for sub-samples created based on whether the W.E. borrower is located in Continental Europe or in the U.K. – models [6] and [7]; PF loans extended to U.S. borrowers are associated with 91.2 bps and 45.9 bps higher spreads than PF loans extended to borrowers located in Continental Europe and U.K., respectively. Finally, we also conclude that PF loans extended to Continental Europe and U.K. borrowers are priced in integrated debt markets – Chow test statistic of 0.9. We thus conclude that, within W.E., the difference between PF loan spreads is not driven by the type of the financial system, which means that the way a financial system mobilizes funding for corporate investment, mainly if it is essentially based on financial markets (U.S. and U.K.) or performed in a system where banks and other financial intermediaries play a major role (Continental Europe), does not explain the higher average spread paid by U.S. borrowers versus borrowers located in W.E.[10] However, when creating sub-samples according to whether borrowers are located in Northern Europe versus Southern Europe, we find – Chow test statistic of 23.4 – that PF loans are influenced differently by common pricing characteristics in these two sub-regions.

****** Insert Table 6 about here ******

*4.2.2. The pricing of project finance loans and the debt financing choice*

As described in Section 3, our sample includes syndicated loans closed between the years 2000 and 2014. Our sample period includes the 2007-2008 financial crisis and the subsequent European sovereign debt crisis which have been affecting Western Europe since 2008. Thus, we cannot rule out that a flight to quality may have left many borrowers credit-rationed. As a result, the probability of observing PF deals with relevant pricing information – our sample selection – may not be random but rather determined by the same risk characteristics that enter our pricing regressions. To account for this possibility, we employ a generalized Tobit model, following Heckman (1979). We thus observe the spread when a loan is a PF loan versus any other syndicated loan.

Considering that the choice between project financing and corporate financing affects a firm's cost of capital through leverage implications, the same factors affecting the differences in spreads for PF loans and non-PF loans will also affect the choice. This is the case as project financing typically refers to the transfer of a subset of a company's assets (an 'activity') into a bankruptcy-remote corporation or other SPV; i.e., the assets instrumental to managing the project are separated from the remaining assets of the parties that create the vehicle. This idea is corroborated by Leland (2007), who

[10] A large body of theoretical and empirical research analyzes the main differences between market-based bank-based financial systems. For further detail see La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), Allen and Gale (2000), Levine (2002), Chakraborty and Ray (2006), and references therein.

argues that financial separation of activities "offers the advantage of optimizing the separate capital structures" allowing for greater leverage and financial benefits.

Following prior debt pricing studies [refer to Section 2] we fit the following model (2). We use a full maximum-likelihood procedure, adjust for heteroscedasticity, and cluster standard errors by deal to jointly estimate β, γ, and ρ.

$$\begin{aligned} Spread_i = {} & \alpha_0 + \beta_1\, Loan\ size\ to\ deal\ size_i + \beta_2\, Deal\ size_i + \beta_3\, Maturity_i + \beta_4\, Number\ of\ banks_i \\ & + \beta_5\, Distribution\ Method_i + \beta_6\, Seniority_i + \beta_7\, Crisis_i + \beta_8\, Term\ loan_i + \beta_9\, Risk\ free\ rate_i \\ & + \beta_{10}\, Volatility_i + \beta_{11}\, 5yTB - 3mTB_i + \beta_{12}\, Rated_i + \beta_{13}\, Rating * rated_i + \beta_{14}\, Fixed\ rate_i \\ & + \beta_{15}\, Country\ risk_i + \beta_{16}\, Currency\ risk_i + \varepsilon_i \end{aligned} \tag{2}$$

We assume credit spread is observed if

$$\begin{aligned} & \gamma_0 + \gamma_1\ Deal\ size_i + \gamma_2\, Maturity_i + \gamma_3\, Crisis_i + \gamma_4\, Risk\ free\ rate_i + \gamma_5\, Volatility_i \\ & + \gamma_6\, 5yTB - 3mTB_i + \gamma_7\, Country\ risk_i + \gamma_8\, Currency\ risk_i + \nu_i > 0 \end{aligned} \tag{3}$$

We test the effect of eleven contract characteristics and five macroeconomic variables on PF loan spreads and control for industry fixed effects. We also analyze the effect of three contract characteristics and five macroeconomic variables on firm's choice between PF and non-PF loans. As pointed out, we cannot include PF loans arranged for both U.S. and W.E. borrowers in a single regression. Instead, we examine what affects the spread and the probability of a new borrower in the U.S. and W.E. choosing between PF loans and other syndicated loans, separately.

According to the flotation costs hypothesis [Houston and James (1996), Krishnaswami *et al.* (1999), Esho *et al.* (2001), and Denis and Mihov (2003)], small public debt issues are not cost-effective. Therefore, firms choose public debt over private when the issue is sufficiently large. Considering that structuring a PF transaction is costlier than traditional corporate financing alternatives [Esty (2004a) and Gatti (2008)] it is expected that relatively small PF deals would also not be cost-effective. Thus, we expect firms to choose PF for relatively large amounts of debt to economize on scale.

Flannery (1986) and Diamond (1991a, 1993) point out that when information about the true quality of a firm's assets is asymmetrically distributed, outsiders may perceive short-term debt issues as a signal of assets quality. Thus, we hypothesize that a borrower seeking relatively longer-term funding will choose project financing over corporate financing to reduce information asymmetry problems and enable longer-term borrowing.

Esty (2003) and Corielli *et al.* (2010) characterize PF as most commonly used (*i*) for capital-intensive facilities or utilities with relatively transparent cash flows, (*ii*) to secure longer-term funding, (*iii*) in riskier countries. We, thus, expect that firms from countries with higher sovereign credit risk are more likely to utilize PF. Given the important role of PPPs in reducing government borrowing and

shifting risks to private sector, we expect government and public sector entities to rely more on PF during the 2007-2008 financial crisis, as well as during the subsequent European sovereign debt crisis.

We expect higher interest rates and steeper yield curve slopes to negatively influence the probability of a firm choosing project financing over corporate financing, since that might reflect an increase in future interest rates in order to control inflation; i.e., in periods of economic growth PF loses relevance as a mechanism of reducing the need for government borrowing.

Finally, Pinto and Santos (2016) analyzing the choice between PF loans, asset securitization bonds and corporate bonds, find that debt exposed to currency risk is less likely to be structured as a PF transaction rather than a corporate bond. We thus expect currency risk to influence negatively the probability of observing a PF loan instead of any other syndicated loan. On the contrary, authors find that more market volatility would increase the probability of observing a PF transaction.

Table 7 reports results for two models: models [8] and [9] involve firms' choice of PF loans over non-PF loans in the U.S. and W.E., respectively. We begin by estimating the determination equation in models [8] and [9] for PF loans, using each of the two high-information samples discussed in the previous section.

****** Insert Table 7 about here ******

The second line of Table 7 details the influence of loan size to deal size in PF loan spreads, which is insignificant for U.S. loans but significant and positive for W.E. loans. This suggests that increasing the weight of the tranche size to the transaction size will increase the required spread for PF loans extended to W.E. borrowers. This might be explained by the fact that a higher loan size to deal size ratio means greater risk for lenders. The influence of deal size on spread is negative and significant for PF loans closed in both regions. This suggests that increasing the deal size by $US 100 million will reduce the required spread by 1.2 bps and 1.7 bps for PF loans extended to U.S. and W.E. borrowers, respectively.

Contrary to Kleimeier and Megginson (2000), who point out that spread and maturity have an insignificant relationship, we show a significantly negative relationship for PF loans closed in both the U.S. and W.E. The coefficient values indicate that issuing a PF loan, with an original maturity one year longer than the mean, decreases spread by 2.5 bps and 1.2 bps, respectively.

The variable number of banks behaves differently for PF loans extended to U.S. borrowers compared to PF loans arranged for borrowers located in W.E. While spread and the number of banks are negatively and significantly related for PF loans arranged for U.S. borrowers, they have an insignificant relationship for PF loans extended to W.E. borrowers. A larger number of banks involved may lower the spread because this can be associated with an increase in the certification of the transaction and thus mean that a higher number of banks will share default risk.

Senior loans rather than junior ones extended to borrowers located in W.E. have lower spreads. The 2007-2008 financial crisis and the subsequent European sovereign debt crisis have imposed a significant increase in credit spreads for PF loans. A transaction with an active date during

the crisis period will have a higher average credit spread of 103.4 bps and 125.3 bps for PF loans arranged for U.S. and W.E. borrowers, respectively. The variable *fixed rate* behaves differently for PF loans extended to U.S. borrowers rather than to W.E. borrowers. Spread and fixed rate are significantly positively related for PF loans arranged for U.S. borrowers; U.S. borrowers pay a 131.5 bps premium in order to close a fixed coupon rate instead of a floating coupon rate. However, they have an insignificant relationship for PF loans closed by W.E. borrowers.

Regarding macroeconomic variables, the risk free rate has an insignificant relationship with U.S. PF loan spreads, but a significantly negative relationship with PF loan spreads arranged for W.E. borrowers, i.e., the higher the general level of interest rates the lower the spread. Our findings for W.E. PF loans differ from those of Blanc-Brude and Strange (2007), who find for a sample of EU and U.K. Public-Private Partnership loans that the risk-free rate has no statistical significance for the pricing of PF tranches. In line with the results presented by Hu and Cantor (2006) and Sorge and Gadanecz (2008), spread and the yield curve slope, *5YrTB-3mTB*, are significantly negatively related for PF loans extended to borrowers in both the U.S. and W.E., meaning a steeper yield curve is associated with lower credit spreads. Finally, spread and market volatility are significantly negatively related for PF loans. We can thus argue that in higher market volatility scenarios there is a higher demand for syndicated loans *vis-à-vis* other debt alternatives like corporate bonds.

Regarding the impact of credit risk on PF loan spreads, we would expect that an increase in credit rating would increase spreads. However, Table 7 shows an insignificant relationship between spread and rating for PF loans extended to U.S. borrowers. Regarding W.E. PF loans, variables rate and rated*rating were excluded. Both facts can be explained by the small number of PF loan observations (N=16) for rating in our high-information samples.

Next, we examine coefficient signs and magnitudes for the explanatory factors Z in our selection equations. Models [8] and [9] show that borrowers choose PF loans over other syndicated loans when they seek long-term financing. Our results reflect predictions from Flannery (1986) and Diamond (1991a, 1993): when information about the true quality of a firm's assets is asymmetrically distributed between insiders and outsiders, short-term debt issues may be perceived by market participants as assets quality signals. Our findings indicate that asymmetric information problems can be reduced using transactions specifically structured through an SPV and secured by ring-fenced assets which produce cash flows solely to support the transaction. Contrary to what we expected, W.E. firms choose PF loans over non-PF loans when issuing relatively small amounts of debt. Regarding PF loans extended to U.S. borrowers, deal size does not influence the probability of observing project financing over corporate financing.

The crisis dummy variable behaves differently for PF loans extended to U.S. and W.E. borrowers. While it relates positively to the probability of project financing in W.E., it reduces the probability of choosing PF over other syndicated loans in the U.S. This reflects, as we expected, the important role of PF, namely PPPs, in reducing government borrowing and shifting project risks to

private sector. Contrary to what we expected, interest rate levels and yield curve slope positively influence the probability of observing a PF loan versus a non-PF loan in deals arranged for U.S. borrowers. As expected, for PF loans extended for both U.S. and W.E. borrowers, more market volatility increases the probability of observing a PF transaction. We will investigate further the choice between project financing and corporate financing in section 5, where we take into consideration sponsors – in PF loans – and borrowers' – in non-PF loans – accounting and market characteristics.

In models [8] and [9], the likelihood-ratio test for $\rho = 0$ and Wald test for rho=0 lead us to reject the hypothesis of equations (2) and (3) above being independent, pointing out the presence of selection bias.

*4.3. The impact of the financial crisis on project finance loan spreads and borrower's choice*

Based on regression results presented in Section 4.2 we find that the 2007-2008 financial crisis and the subsequent European sovereign debt crisis impacted significantly both PF loan spreads and borrower's choices in W.E. In order to investigate further the impact of the 2007-2008 financial crisis and the subsequent European sovereign debt crisis on pricing processes and financing choice we split our high-information sample into a pre-crisis period from January 1, 2000 to September 14, 2008, and a crisis period from September 15, 2008 (Lehman Brothers' bankruptcy filing date) through December 31, 2014. Additionally, in order to examine whether the spreads and the borrower's choice are different in Continental Europe than in U.K. we use equations (2) and (3), and create one dummy variable set equal to 1 if the loan is extended to a U.K. borrower, and 0 otherwise.

Starting with the estimation results for the determination equation, Models [10a] and [10b] in Table 7 show that the coefficient of the *risk free rate* remains (when comparing regression results for pre-crisis and crisis sub-samples) significantly negatively related to credit spread. Similarly, the coefficient of the *U.K. Borrowers* dummy remains significantly positively related to credit spread, which means that PF loans extended to U.K. borrowers have higher spreads when compared to spreads paid by borrowers located in Continental Europe. It is important to notice that all the referred coefficients increase their values. The coefficients on *seniority*, *fixed rate* and *currency risk* dummy variables become insignificant. Finally, the variables *loan size to deal size* and *country risk* become significantly positively related to credit spread. Thus, we can identify a change in the type of factors that explain PF loan credit spreads: bank liquidity (loan size to deal size) and sovereign risk (country risk) became important factors during the crisis period. The statistical significance of loan size to deal size might be explained by the fact that a higher ratio means greater risk for bank lenders. Additionally, during the crisis period banks lost balance sheet capacity to lend. The significant positive relationship between country risk and spread during the crisis period is not a surprise, since rating agencies downgraded sovereign ratings from several Western European countries (e.g., Belgium, Greece, Ireland, Italy, Portugal, and Spain).

Regarding the coefficient signs and magnitudes in our selection equations, models [10a] and [10b] in Table 7 reveal that, in both periods, W.E. firms prefer PF loans when seeking longer-term funding and in times of more market volatility. The coefficients of the *deal size* and *U.K. Borrowers* dummy variable become insignificant during the crisis period; i.e., both deal size and if the borrower belongs to the U.K. do not impact the probability of observing project financing over corporate financing. On the contrary, the coefficient of *currency risk* dummy variable become affecting negatively the probability of observing a PF loan, which means that debt exposed to currency risk is less likely to be structured as project finance rather than corporate financing.

The yield curve slope influences the borrower's choice in pre-crisis and crisis periods differently. While it relates negatively to the probability of project financing in W.E. during the pre-crisis period, it increases the probability of choosing PF over other syndicated loans during the crisis period. The variable *risk free rate* become influencing negatively the probability of observing a PF deal during the crisis period. Finally, transactions by firms in countries with higher sovereign credit risk are more likely to be arranged as PF loans than other syndicated loans. These results noticeably reflect the importance of PF, namely PPPs, in reducing a government's borrowing and shift project risks to private sector during the crisis period, mainly in Southern European countries.

## 5. Firms' characteristics and the choice between project financing and corporate financing

This section presents univariate and multivariate analysis examining firm choice between PF and non-PF debt; i.e., off-balance sheet versus on-balance sheet debt financing. Building on debt financing choice empirical literature [Houston and James (1996), Krishnaswami *et al.* (1999), Cantillo and Wright (2000), Denis and Mihov (2003), Altunbas *et al.* (2010), and Pinto and Santos (2016)], we examine how firm characteristics influence the choice between PF and non-PF loans while controlling for contractual characteristics and macroeconomic factors. We analyze public firms' debt choice distinctly from debt choice of private firms as the two borrower types vary importantly across fundamental characteristics.

### *5.1. Methodology*

In order to investigate the determinants of firms' debt financing choice, we use a unique dataset, compiled from three different data providers (Dealscan, Orbis, and Datastream). Our sample includes 750 PF loans (470 PF deals) and 33,962 non-PF loans (25,838 non-PF deals) closed by 6,381 publically traded firms located in W.E. and the U.S. between 2000 and 2014. It also includes 89 PF loans (59 PF deals) and 3,384 PF loans (2,031 non-PF deals) closed by 1,107 privately held firms. We link the choice between project financing and corporate financing to firm characteristics reported around the loan closing date (the closest fiscal year end in the period [–395 days to +30 days]). Following existing literature, we focus on firm characteristics that reflect transaction costs, renegotiation and liquidation risks, and information asymmetries. For this analysis, we utilize a

logistic regression model.[11] Our dependent variable, choice of debt, is a binary variable equal to 1 if the firm closes a PF loan and 0 if it, instead, closes a non-PF loan. Next, we identify specific firm characteristics to use as explanatory variables.

Esty (2003, 2004a, 2004b) and Corielli *et al.* (2010) argue that PF can help to reduce underinvestment due to asymmetric information problems. The separation of projects from the sponsoring firm or firms facilitates initial credit decisions and it is relatively easy to convey information that would either be more difficult in a corporate financing framework, in which the joint evaluation of the project and existing assets can be more problematic. Additionally, active monitoring by a lender can help mitigate agency costs associated with moral hazard [Diamond (1991b)]. Since banks in a PF transaction are often shareholders, we expect firms facing high information asymmetry costs to choose PF because banks can more efficiently reduce such costs in such transaction than in corporate financing. Thus, firms with higher information asymmetry may naturally prefer project financing to corporate financing. Firm size and market-to-book ratio are commonly used as proxies for incentive problems related to information asymmetries [Krishnaswami *et al.* (1999), Esho *et al.* (2001), Denis and Mihov (2003), and Altunbas *et al.* (2010)]. We also use market-to-book ratio to gauge a public firm's growth potential. As identified by Smith and Watts (1992) and Barclay and Smith (1995), expected future growth increases a firm's market-to-book ratio. This forward-looking ratio reflects investor expectations about a firm's cash flow potential.

Project finance highly leveraged capital structures plays an important disciplinary role because it prevents managers from wasting free cash flow, and deters related parties from trying to appropriate it [Brealey *et al.* (1996), Esty (2003), and Fabozzi *et al.* (2006)]. Due to restrictive covenants, direct credit monitoring, and *ex post* renegotiation, PF transactions are more effective in mitigating agency conflicts between borrowers and lenders than traditional syndicated lending. Thus, PF lending seems particularly well suited for risky borrowers with high agency costs of debt. As in previous empirical studies, we use debt to total assets and short-term debt to total debt as a proxy for a borrowers' level of financial constraint. Considering that PF loans are off-balance sheet transactions, we predict that higher leveraged firms will choose project finance over corporate financing to improve or maintain key financial ratios [Caselli and Gatti (2005) and Fabozzi *et al.* (2006)]. This argument is even stronger for short-term debt to total debt, as it is a more direct proxy for firms' financial distress [Diamond (1991b) and Esho *et al.* (2001)].

Asset tangibility, proxied by fixed assets to total assets, reflects a firms' liquidation value. All else equal, higher asset tangibility increases a creditor's expected recovery in default. As PF is most commonly used for off-balance sheet capital-intensive projects, we expect this ratio to positively

[11] The logistic regression is used in cases of dichotomous dependent variables (in our case, PF versus non-PF). An alternative to the logistic regression analysis is a probit regression. We find similar results using either model; our probit analysis is available upon request.

influence the probability of a sponsoring firm choosing a PF loan over a non-PF loan; i.e., firms in industries with higher levels of asset tangibility increase the probability of observing a PF transaction.

Profitability is measured as return on assets. Nevitt and Fabozzi (2001) assert that sponsors use a PF transaction to improve the key financial ratios. We, thus, expect return on assets to relate negatively to the probability of PF lending.

We control for debt contracting characteristics, namely, transaction size, time to maturity, and whether debt is subject to currency risk. As financing choice may be sector-specific, we use dummy variables to control for industry factors. We also account for macroeconomic conditions using proxies for sovereign default risk, financial crisis, interest rate levels, market volatility, and yield curve slope. A final dummy variable – *switcher* – identifies firms that employ multiple debt types (PF loans and non-PF loans) within our sample period.

We model the choice between project financing and corporate financing as follows:

$$\begin{aligned} Choice\ of\ debt_{i,t} = {} & \alpha_0 + \beta_1 Corporate\ characteristics_{i,t-1} + \beta_2 Contracting\ characteristics_{i,t} \\ & + \beta_3 Macro\ \ factors_t + \varepsilon_{i,t} \end{aligned} \tag{4}$$

Next we present our statistical and econometric results for public and private firms separately.

*5.2. Public firms*

*5.2.1. Univariate analysis*

Table 8 reports characteristics of public firms that were sponsors in a PF syndicated loan or borrowers in a non-PF loan. We created two sub-samples according to whether firms are located in W.E. or in the U.S. Our sample comprises deals that often are divided into smaller facilities or loans. Our descriptive analysis is based on the deals, otherwise the analyses would be biased towards deals with several loans. However, our econometric analysis uses data per loan, clustered by deals.

****** Insert Table 8 about here ******

On average, borrowers that used PF loans are typically larger – with an average size of $33.5 billion, firms in category [I] have borrowing needs and capacity to use PF syndicated loans extensively – and have higher short-term debt levels and asset tangibility than those accessing non-PF debt. On the contrary, non-PF borrowers (category [II]) are more levered and have higher return on assets ratios. These results are not surprising. PF is highly demanded when it does not substantially impact the balance sheet or the creditworthiness of the sponsoring entity. Market-to-book ratios do not differ at the 5% significance levels for the two subsets of firms.

When dividing our sample into firms located in W.E. *vis-à-vis* in the U.S. we document the following univariate differences to consider, namely: (*i*) W.E. sponsors that used PF loans are more levered and have lower market-to-book ratios than those accessing non-PF debt markets; (*ii*) U.S. firms utilizing corporate financing are much larger than those reliant on project financing; and (*iii*)

leverage levels, short-term debt levels and market-to-book ratios do not differ significantly between U.S. firms in categories [I] and [II].

*5.2.2. Multivariate analysis*

Table 9 reports results from logistic regressions of Equation (4). Model [11] predicts 6,381 firms' choice between PF and non-PF debt instruments with a sample of 34,712 loans. In order to examine whether the firm's choices are different in W.E. than in the U.S. as well as the impact of the 2007-2008 financial crisis on financing choice we re-estimate model [11] for two sub-samples considering whether borrowers in non-PF loans and sponsors in PF loans are located in the W.E. (model [12]) or the U.S. (model [13]) and if the loan closing date belongs to a pre-crisis period from January 1, 2000 to September 14, 2008 or a crisis period from September 15, 2008 (Lehman Brothers' bankruptcy filing date).[12]

****** Insert Table 9 about here ******

We find that firms with potential asymmetric information problems, relatively smaller ones, prefer corporate financing via non-PF loans. This result holds for our sub-samples with the exception of the U.S. firms' sub-sample where there is an insignificant relationship between firm size and the probability of observing project financing *vis-à-vis* corporate financing in both pre-crisis and crisis periods. However, the market-to-book ratio does not affect the probability of observing PF over non-PF loans. Thus, our results do not corroborate PF literature which states that firms prefer project financing to corporate financing in order to reduce incentive problems related to information asymmetries. On the contrary, our results support security design literature [Flannery (1986) and Diamond (1991a, 1993)] which predicts that PF reduces asymmetric information problems and enables borrowers to obtain funding with longer maturities.

Contrary to what we expected, we find transaction size to negatively affect the probability of issuing PF loans instead of non-PF loans. Thus, firms do not choose PF for relatively large amounts of debt to economize on scale.

Results document that more levered W.E. firms tend to choose PF over non-PF lending. This finding is unsurprising because project financing allows sponsors to maintain financial flexibility and protect their credit capacity through off-balance sheet financing. The argument is even stronger since we report a positive relationship between short-term debt level and likelihood to access PF markets. Thus, our results present evidence regarding PF transactions as a mechanism that reduces agency conflicts between borrowers and lenders in W.E.

As expected (model [11]), higher asset tangibility is positively associated with firm preference of PF over corporate financing. This result holds for W.E. firms in both pre-crisis and crisis periods (models [12a] and [12b]); i.e., W.E. firms in industries with higher levels of asset tangibility increase

[12] We also re-estimated models [11], [12], and [13] controlling for country and year fixed effects and results are largely the same. We present results without these fixed effects because *country risk* variable is the interaction between country rating and closing date and when including year fixed effects *crisis* dummy loses significance.

the probability of observing a PF transaction in the 2000-2014 period. Regarding U.S. firms, we find that while higher asset tangibility is positively associated with U.S. firms' preference of PF over corporate financing during the pre-crisis period (model [13a]), asset tangibility and the probability of observing a PF loan *vis-à-vis* a non-PF loan have an insignificant relationship during the crisis period (model [13b]). These results combined with the positive impact of the *crisis* dummy variable with the probability of observing project financing over corporate financing reflects the important role of PF, namely PPPs, in reducing government borrowing and shifting project risks to private sector in W.E. countries during the 2007-2008 financial crisis and the subsequent sovereign debt crisis.

We find that, when controlling for other micro and macro variables, profitability reduces the likelihood of accessing the PF loans market: we find return on assets to negatively affect the probability of issuing PF loans instead of non-PF loans in both W.E. and the U.S., as well as in both pre-crisis and crisis periods. We also find that firms which employ both PF and corporate finance lending within our sample period are more likely to choose PF loans when issuing new debt. Sponsors that have already participated in PF face lower transaction costs. This is no surprise as PF transactions are expensive to orchestrate and take longer to execute [Esty (2003, 2004a) and Fabozzi *et al.* (2006)]. Finally, transactions by firms in countries with higher sovereign credit risk are more likely to be arranged as PF loans than other syndicated loans.[13]

By comparing firms' debt choices, we find mixed evidence regarding PF as a mechanism that facilitates the reduction of the deadweight costs from asymmetric information problems. When considering firm size and market-to-book ratio as proxies for incentive problems related to information asymmetries we do not find evidence of firms choosing PF in order to reduce information asymmetries. However, we find that PF enables borrowers to obtain funding with much longer maturities than non-PF syndicated lending, which is in line with security design literature: structured finance transactions reduce asymmetric information problems and enable borrowers to obtain funding with longer maturities. We also find that PF transactions in W.E. more effectively mitigate agency conflicts between borrowers and lenders, and that firms do not choose PF for relatively large amounts of debt to economize on scale. However, PF transactions allow sponsors to maintain financial flexibility and protect their credit standing and future access to syndicated lending by creating non-recourse vehicle entities to carry the debt. Overall, our results show that firms utilizing PF are larger, less profitable and have higher asset tangibility and higher level of financial constraint.

[13] We re-estimated our models including current ratio (defined as current assets divided by current liabilities) as an additional control variable. We decided to exclude this variable from our model because that would impose a significant reduction in the number of observations and results remain largely the same. We find that a higher current ratio positively affects the probability of observing a PF loan rather than a non-PF loan for both W.E and U.S. firms in pre-crisis and crisis periods.

*5.3. Private firms*

*5.3.1. Univariate analysis*

Table 10 reports characteristics of private firms that were sponsors in a PF syndicated loan (category [I]) or borrowers in a non-PF loan (category [II]). We also created a sub-sample according to whether firms are located in W.E. – we do no find information for U.S. PF sponsors during our sample period. Again, our descriptive analysis is based on the deals, while econometric analysis uses data per loan, clustered by deals.

****** Insert Table 10 about here ******

Debt to total assets and fixed assets to total assets are similar for firms in categories [I] and [II] at the 5% significance level. PF sponsors are, on average, smaller and less profitable than borrowers which choose non-PF lending.

*5.3.2. Multivariate analysis*

Table 11 reports results from logistic regressions of Equation (4). Model [14] predicts the choice of 1,071 firms between PF and non-PF debt instruments; model [14a] predicts the choice of 984 firms between project financing and corporate financing. The models assess 3,365 and 3,077 loans, respectively. As we only hand-matched private sponsors' accounting information with contractual characteristics for 89 loans, we first estimate Equation (4) excluding firms' characteristics (model [14]) and then a new model in which *total assets*, *debt to total assets*, *fixed assets to total assets*, and *return on assets* variables are included as additional control variables. Finally, considering that we only have information for sponsors located in W.E., we excluded from our analysis all non-PF loans extended to U.S. borrowers.

****** Insert Table 11 about here ******

Model [14] shows that W.E. private firms choose PF when they seek long-term financing and raise relatively higher amounts of debt. Thus, firms choose PF for relatively large amounts of debt to economize on scale. Furthermore, firms employing project financing over corporate financing tend to operate in countries with lower sovereign debt ratings. Finally, the *crisis* dummy variable increases the probability of choosing PF over other syndicated loans in W.E.

When considering sponsors' characteristics in our model specification (model [14a]), we find that firms with potential asymmetric information problems, relatively smaller ones, prefer project financing. We also find that PF enables borrowers to obtain funding with longer maturities. Thus, our results show that firms prefer project financing to corporate financing in order to reduce incentive problems related to information asymmetries.

Our results show that when controlling for other micro and macro variables, profitability reduces the likelihood of accessing the PF loans market. Firms which employ both PF and corporate finance lending within our sample period are more likely to choose PF loans when issuing new debt. Finally, if the sponsor is located in the U.K., this positively affects the probability of observing a PF

loan rather than a non-PF loan, which is consistent with the important role played by PF transactions in financing of large public infrastructure projects in the U.K.

## 6. Summary and conclusions

This paper provides empirical evidence on the pricing of project finance *versus* non-project finance loans as well as on firms' borrowing decisions, namely on the factors that influence a borrower's choice between off-balance sheet financing via project finance and on-balance sheet financing via corporate finance. The paper supports the notion that project finance creates value by reducing the cost of funding: we document that project finance loans are associated, holding other factors constant, with lower spreads than those of corporate control, capital structure, and general corporate purpose loans in both W.E. and the U.S.; and whereas for loans extended to U.S. borrowers, the spread on project finance loans and fixed asset based loans do not differ significantly, project finance is associated with a statistically significant 20.7 bps drop in spreads for loans arranged for W.E. borrowers. In particular, our results are consistent with the use of project finance to reduce agency problems, asymmetric information costs, and improving risk management.

Our results document that publicly traded sponsors who prefer project financing to corporate financing are larger, less profitable, more financial distressed and have higher asset tangibility. We thus find evidence consistent with the notion that project finance loans are more effective in mitigating agency conflicts between borrowers and lenders than non-project finance syndicated loans. We also find that public firms do not choose project finance for relatively large amounts of debt to economize on scale, but off-balance sheet financing via project finance transactions allow sponsors to maintain financial flexibility and protect their credit standing and future access to syndicated lending by creating non-recourse vehicle entities to carry the debt.

Examining privately held firm choice between project financing and corporate financing, we find that those who choose off-balance sheet financing are smaller and less profitable. Firms use project finance to raise relatively larger amounts of debt and when they operate in countries with lower sovereign debt ratings.

We find that transaction cost considerations lead public and private firms that use both project financing and corporate financing during our sample period to choose project finance for new debt. We also document that project finance enables both types of sponsors to obtain funding with much longer maturities, which is in line with security design literature. Finally, the 2007-2008 financial crisis and the subsequent sovereign debt crisis increases the probability of a new sponsor choosing project finance loans over other corporate finance syndicated loans.

**References**


Allen, F., and D. Gale, 2000. *Comparing Financial Systems*, MIT Press, Cambridge, MA.

Altunbas, Y., K. Alper, and D. Marqués-Ibáñez, 2010. Large Debt Financing: Syndicated Loans Versus Corporate Bonds, *The European Journal of Finance* 16, 437-458.

Barclay, M., and C. Smith, 1995. The Maturity Structure of Corporate Debt, *Journal of Finance* 50, 609-631.

Berg, T., A. Saunders, and S. Steffen, 2015. The Total Cost of Corporate Borrowing in the Loan Market: Don't Ignore the Fees, *Journal of Finance* 71, 1357-1392.

Berlin, M., and J. Loyes, 1988. Bond Covenants and Delegated Monitoring, *Journal of Finance* 43, 397-412.

Blanc-Brude, F., and R. Strange, 2007. How banks price loans to public private partnerships: Evidence from the European markets, *Journal of Applied Corporate Finance* 19, 94-106.

Bonetti, V., S. Caselli, and S. Gatti, 2010. Offtaking agreements and how they impact the cost of funding for project finance deals: A clinical case study of the Quezon Power Ltd Co., *Review of Financial Economics* 19, 60-71.

Boyd, J., and E. Prescott, 1986. Financial Intermediary Coalitions, *Journal of Economy Theory* 38, 211-232.

Brealey, R., I. Cooper, and M. Habib, 1996. Using project finance to fund infrastructure investments, *Journal of Applied Corporate Finance* 9, 25-38.

Cantillo, M., and J. Wright, 2000. How Do Firms Choose Their Lenders? An Empirical Investigation, *Review of Financial Studies* 13, 155-189.

Carey, M., and G. Nini, 2007. Is the corporate loan market globally integrated? A pricing puzzle, *Journal of Finance* 62, 2969-3007.

Caselli, S., and S. Gatti, 2005. *Structured Finance: Techniques, Products and Market*, Springer: Berlin.

Chakraborty, S., and T. Ray, 2006. Bank-based versus market-based financial systems: A growth-theoretic analysis, *Journal of Monetary Economics* 53, 329-350.

Chemmanur, T., and P. Fulghieri, 1994. Reputation, Renegotiation, and the Choice Between Bank Loans and Publicly Traded Debt, *Review of Financial Studies* 7, 475-506.

Corielli, F., S. Gatti, and A. Steffanoni, 2010. Risk Shifting through Nonfinancial Contracts: Effects on Loan Spreads and Capital Structure of Project Finance Deals, *Journal of Money, Credit and Banking* 42, 1295-1320.

Denis, D., and V. Mihov, 2003. The Choice Among Bank Debt, Nonbank Private Debt, and Public Debt: Evidence From New Corporate Borrowings, *Journal of Financial Economics* 70, 3-28.

Diamond, Douglas, 1984. Financial Intermediation and Delegated Monitoring, *Review of Economic Studies* 51, 393-414.

Diamond, Douglas, 1991a. Debt Maturity Structure and Liquidity Risk, *Quarterly Journal of Economics* 106, 709-737.

Diamond, Douglas, 1991b. Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt, *Journal of Political Economy* 99, 689-721.

Diamond, Douglas, 1993. Seniority and Maturity of Debt Contracts, *Journal of Financial Economics* 33, 341-368.

Esho, N., Y. Lam, and I. Sharpe, 2001. Choice of Financing Source in International Debt Markets, *Journal of Financial Intermediation* 10, 276-305.

Esty, Benjamin, 2003. *The Economic Motivations for Using Project Finance*, Boston: Harvard Business School publishing.

Esty, Benjamin, 2004a. *Modern Project Finance – A Casebook*, John Wiley & Sons, Inc.

Esty, Benjamin, 2004b. Why Study Large Projects? An Introduction to Research on Project Finance, *European Financial Management* 10, 213-224.

Esty, B., and A. Sesia, 2007. *An Overview of Project Finance & Infrastructure Finance – 2006 Update*, Boston: Harvard Business School publishing.

Esty, B., and W. Megginson, 2003. Creditor rights, enforcement, and debt ownership structure: Evidence from the global syndicated loan market, *Journal of Financial and Quantitative Analysis* 38, 37-59.

Fabozzi, F., H. Davis, and M. Choudhry, 2006. *Introduction to Structured Finance*, Wiley Finance.

Finnerty, John, 1988. Financial Engineering in Corporate Finance: An Overview, *Financial Management* 17, 14-33.

Fiori, F., and H. Uhlig, 2011. Bank Finance versus Bond Finance, *Journal of Money, Credit and Banking* 43, 1399-1421.

Flannery, Mark, 1986. Asymmetric Information and Risky Debt Maturity Choice, *Journal of Finance* 41, 19-37.

Gabbi, G., and A. Sironi, 2005. Which Factors Affect Corporate Bonds Pricing? Empirical Evidence from Eurobonds Primary Market Spreads, *European Journal of Finance* 11, 59-74.

Gatti, Stefano, 2008. *Project Finance in Theory and Practice – Designing, Structuring, and Financing Private and Public Projects*, Academic Press Advanced Finance Series.

Gatti, S., S. Kleimeier, W. Megginson, and A. Steffanoni, 2013. Arranger Certification in Project Finance, *Financial Management* 42, 1-40.

Heckman, James, 1979. Sample selection bias as a specification error, *Econometrica* 47, 153-161.

Houston, J., and C. James, 1996. Bank Information Monopolies and the Mix of Private and Public Debt Claims, *Journal of Finance* 51, 1863-1889.

Hu, J., and R. Cantor, 2006. The relationship between issuance spreads and credit performance of structured finance securities, *Journal of Fixed Income* 16, 5-20.

Johnson, Shane, 1997. An Empirical Analysis of the Determinants of Corporate Debt Ownership Structure, *Journal of Financial and Quantitative Analysis* 32, 47-69.

Kleimeier, S., and W. Megginson, 2000. Are project finance loans different from other syndicated credits?, *Journal of Applied Corporate Finance* 13, 75-87.

Krishnaswami, S., P. Spindt, and V. Subramaniam, 1999. Information Asymmetry, Monitoring, and the Placement Structure of Corporate Debt, *Journal of Financial Economics* 51, 407-434.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1997. Legal determinants of external finance, *Journal of Finance* 52, 1131-1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 1998. Law and finance, *Journal of Political Economy* 106, 1113-1155.

Leland, Hayne, 2007. Financial synergies and the optimal scope of the firm: Implications for mergers, spinoffs, and structured finance, *Journal of Finance* 62, 765-807.

Levine, Ross, 2002. Bank-based or market-based financial systems: which is better?, *Journal of Financial Intermediation* 11, 1-30.

Nevitt, P., and F. Fabozzi, 2001. *Project Financing*, London: Euromoney, 7th Edition.

Pinto, J., and M. Santos, 2016. Debt financing choices: theory and evidence from Europe, Working paper, http://ssrn.com/abstract=2409730.

Rajan, Raghuram, 1992. Insiders and Outsiders: The Choice Between Informed and Arm's-length Debt, *Journal of Finance* 47, 1367-1400.

Smith, C., and R. Watts, 1992. The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies, *Journal of Financial Economics* 32, 263-92.

Sorge, M., and B. Gadanecz, 2008. The term structure of credit spreads in project finance, *International Journal of Finance and Economics* 13, 68-81.

**Table 1: Contractual characteristics of all loans with $US amount available**

| Variable of interest | Project finance loans | Corporate control loans | Capital structure loans | Fixed asset based loans | General corporate purpose loans |
|---|---|---|---|---|---|
| Total volume [$US Million] | 2,108,811.8 | 7,854,520.1 | 7,874,882.3 | 1,218,581.9 | 23,644,579.6 |
| Number of Deals | 5,935 | 13,385 | 18,944 | 8,046 | 88,881 |
| Number of loans | 10,950 | 30,427 | 30,946 | 10,333 | 118,617 |
| Loan size [$US Million] | | | | | |
| Mean | 192.1 | 254.2 | 253.8 | 117.8 | 198.4 |
| Median | 74.7 | 70.0 | 100.0 | 63.5 | 71.5 |
| Minimum | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 |
| Maximum | 4,824.0 | 12,500.0 | 5,247.2 | 1,650.0 | 3,990.0 |
| Average Maturity [years] | 11.4 | 5.4 | 4.2 | 5.2 | 4.1 |
| Loans to U.S. borrowers | 11.3% | 51.3% | 33.0% | 38.4% | 42.9% |
| Loans to W.E. borrowers | 33.0% | 32.9% | 20.1% | 15.1% | 14.6% |
| Loans with fixed rate | 25.8% | 5.2% | 20.3% | 19.6% | 20.4% |
| Average number of banks | 5.2 | 6.0 | 7.4 | 3.7 | 5.3 |
| Term loans | 92.4% | 65.1% | 56.1% | 87.3% | 54.6% |

Table 1 presents contractual characteristics for the full sample of project finance (PF) loans, plus four sub-samples of non-project finance (non-PF) loans categorized by loan purpose code. In this table we require only that the loan amount be available. The first column describes characteristics of the sample of loans in the Dealscan database with deal purpose code of "project finance". Corporate control loans are arranged to fund acquisitions, leveraged buyouts, management buyouts, mergers, and employee stock ownership plans. Capital structure loans are those arranged for refinancing, recapitalizations, debt repayment, standby commercial paper facilities, stock buybacks, securities purchase, and debtor in possession financing. Fixed asset based loans are arranged to acquire property or other mortgage financing, aircraft, shipping, hardware, or telecom build-out. Finally, General corporate purpose loans are those arranged for corporate purposes, capital expenditures, trade finance, working capital, or their loan purpose code or else have no purpose listed.

**Table 2: Descriptive statistics for high-information PF and non-PF loans**

***Panel A: High-information loans with spread available - continuous variables***

| Variable of interest | Project finance loans | | | Corporate control loans | | | Capital structure loans | | | Fixed asset based loans | | | General corporate purpose loans | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Mean | Median | Number | Mean | Median | Number | Mean | Median | Number | Mean | Median | Number | Mean | Median |
| Spread [bps][1] | 3,510 | 224.0 | 188.0 | 23,406 | 312.7 | 275.0 * | 19,370 | 220.1 | 190.0 * | 4,967 | 194.0 | 190.0 * | 57,796 | 228.3 | 200.0 * |
| Rating [1-22 weak][2] | 16 | 10.0 | 8.9 | 637 | 9.5 | 9.3 | 1,189 | 8.6 | 8.5 * | 10 | 9.6 | 9.6 | 3,254 | 8.9 | 8.8 ** |
| Country rating [1-22 weak][3] | 2,940 | 3.5 | 1.0 | 23,108 | 1.3 | 1.0 * | 18,674 | 2.0 | 1.0 * | 4,707 | 2.0 | 1.0 * | 55,732 | 1.7 | 1.0 * |
| Deal size | 1,942 | 450.9 | 204.2 | 9,876 | 603.7 | 200.0 | 11,462 | 493.0 | 225.0 ** | 3,903 | 133.5 | 72.6 * | 40,934 | 356.0 | 155.0 * |
| Loan size | 3,510 | 234.0 | 100.0 | 23,406 | 246.2 | 70.3 * | 19,370 | 289.6 | 117.9 * | 4,967 | 104.0 | 58.8 * | 57,796 | 250.4 | 100.0 * |
| Loan size to deal size | 3,510 | 53.7% | 50.0% | 23,406 | 41.8% | 30.3% * | 19,370 | 58.8% | 54.7% * | 4,967 | 78.2% | 100.0% * | 57,796 | 70.3% | 93.0% * |
| Number of tranches | 1,942 | 2.1 | 2.0 | 9,876 | 2.5 | 2.0 * | 11,462 | 1.7 | 1.0 * | 3,903 | 1.3 | 1.0 * | 40,934 | 1.4 | 1.0 * |
| Maturity [years] | 3,378 | 10.9 | 9.6 | 22,492 | 5.5 | 5.0 * | 18,920 | 4.3 | 5.0 * | 4,775 | 4.1 | 3.0 * | 56,222 | 4.1 | 4.3 * |
| Number of banks | 3,494 | 7.1 | 5.0 | 23,390 | 6.5 | 4.0 * | 19,286 | 8.6 | 6.0 * | 4,960 | 4.1 | 3.0 * | 57,634 | 6.6 | 5.0 * |
| Number of covenants | 192 | 1.9 | 2.0 | 4,911 | 2.6 | 3.0 * | 5,299 | 2.3 | 2.0 * | 280 | 2.4 | 2.0 * | 15,347 | 2.2 | 2.0 * |
| Commitment fee [bps] | 17 | 44.2 | 37.5 | 1,084 | 38.3 | 38.8 | 762 | 34.2 | 34.2 *** | 11 | 28.4 | 21.7 *** | 3,804 | 32.9 | 31.3 ** |
| Upfront fee [bps] | 709 | 86.3 | 65.0 | 6,352 | 132.2 | 80.0 * | 7,163 | 61.0 | 40.0 * | 802 | 42.5 | 30.0 * | 9,779 | 61.7 | 45.0 * |

***Panel B: High-information loans with spread available - discrete variables***

| Variable of interest | Project finance loans | | | Corporate control loans | | | Capital structure loans | | | Fixed asset based loans | | | General corporate purpose loans | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | % of total | Nr. (D=1) | Number | % of total | Nr. (D=1) | Number | % of total | Nr. (D=1) | Number | % of total | Nr. (D=1) | Number | % of total | Nr. (D=1) |
| Loans to US borrowers | 3,510 | 20.1% | 705 | 23,406 | 61.6% | 14,428 * | 19,370 | 47.7% | 9,230 * | 4,967 | 62.6% | 3,110 * | 57,796 | 72.4% | 41,873 * |
| Loans to WE borrowers | 3,510 | 34.5% | 1,212 | 23,406 | 30.0% | 7,022 * | 19,370 | 23.1% | 4,484 * | 4,967 | 8.9% | 441 * | 57,796 | 10.5% | 6,055 * |
| Loans to financial institutions | 3,510 | 0.3% | 12 | 23,406 | 2.9% | 678 * | 19,370 | 7.3% | 1,407 * | 4,967 | 2.4% | 118 * | 57,796 | 10.2% | 5,874 * |
| Terms loans | 3,510 | 88.8% | 3,118 | 23,406 | 62.8% | 14,688 * | 19,370 | 51.6% | 9,998 * | 4,967 | 84.0% | 4,173 * | 57,796 | 42.9% | 24,775 * |
| Loans with currency risk | 3,510 | 32.4% | 1,138 | 23,406 | 10.8% | 2,531 * | 19,370 | 17.1% | 3,303 * | 4,967 | 15.7% | 781 * | 57,796 | 15.6% | 9,026 * |
| Loans with fixed rate | 3,510 | 16.8% | 591 | 23,406 | 3.2% | 758 * | 19,370 | 15.2% | 2,952 ** | 4,967 | 14.4% | 713 * | 57,789 | 6.0% | 3,441 * |

Table 2 presents contractual characteristics for the high-information sample of project finance (PF) loans, plus four sub-samples of non-project finance (non-PF) loans categorized by loan purpose code. In this table, we require that both loan amount and spread be available. The first column describes characteristics of the sample of loans in the Dealscan database with deal purpose code of "project finance". Corporate control loans are arranged to fund acquisitions, leveraged buyouts, management buyouts, mergers, and employee stock ownership plans. Capital structure loans are those arranged for refinancing, recapitalizations, debt repayment, standby commercial paper facilities, stock buybacks, securities purchase, and debtor in possession financing. Fixed asset based loans are arranged to acquire property or other mortgage financing, aircraft, shipping,

hardware, or telecom build-out. Finally, General corporate purpose loans are those arranged for corporate purposes, capital expenditures, trade finance, working capital, or their loan purpose code or else have no purpose listed. We test for similar distributions in contract characteristics using the Wilcoxon rank-sum test for continuous variables (Panel A) and the Chi-square test for discrete ones (Panel B). [1] The spread is the spread paid by the borrower over Libor plus the facility fee (all-in-spread-drawn). [2] Loan ratings are based on S&P and Moody's ratings at closing; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. [3] Country risk is the S&P's country credit rating at closing date; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. $^{***}$, $^{**}$, and $^{*}$ indicates significant difference at the 1%, 5%, and 10% levels, respectively, between the sub-samples of non-PF loans and the sample of PF loans.

**Table 3: Chow test for differences in pricing factor coefficients**

| Loan purpose | | Corporate control loans | Capital structure loans | Fixed asset based loans | General corporate purpose loans |
|---|---|---|---|---|---|
| **Project finance loans** | F-Stat | 201.597 | 172.861 | 113.711 | 158.811 |
| | *p-value* | *0.000* | *0.000* | *0.000* | *0.000* |

Table 3 presents the Chow test statistics comparing whether the coefficients in equation (1) are equal in the project finance (PF) loans versus corporate control loans high-information samples, in the PF loans versus capital structure loans high-information samples, in the PF loans versus fixed asset based loans high-information samples, and in the PF loans versus general corporate purpose loans high-information samples. A high-information sample of 2,822 PF loans, 22,187 corporate control loans, 18,153 capital structure loans, 4,514 fixed asset based loans and 54,062 general corporate purpose loans was used in order to perform the Chow test of structural change. The test statistic follows the $F$ distribution with $k$ and $N_1+N_2-2k$ degrees of freedom.

**Table 4: Regression analyses of the cost of borrowing and the debt financing choice**

| | [1] All loans | [1a] PF vs Corporate control loans | [1b] PF vs Capital structure loans | [1c] PF vs Fixed asset based loans | [1d] PF vs General corporate purpose loans | [2] All loans |
|---|---|---|---|---|---|---|
| **Dependent variable** | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | TCB (bps) |
| Intercept | 321.271 *** | 485.897 *** | 457.967 *** | 196.058 *** | 108.775 *** | 539.047 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.004* | *0.000* |
| Project Finance | -42.078 *** | -103.685 *** | -50.887 *** | 34.127 *** | -16.301 *** | -43.744 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| Maturity | 2.009 *** | 3.712 *** | 1.525 *** | -0.024 | -0.557 ** | 1.600 ** |
| | *0.000* | *0.000* | *0.000* | *0.940* | *0.016* | *0.029* |
| Number of banks | -3.327 *** | -3.443 *** | -2.971 *** | -2.695 *** | -3.196 *** | -2.750 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| Deal size | -0.011 *** | -0.011 *** | -0.013 *** | -0.007 | -0.020 *** | -0.009 *** |
| | *0.000* | *0.000* | *0.000* | *0.171* | *0.000* | *0.000* |
| Distribution method | 24.772 *** | 30.800 *** | 26.029 *** | 10.860 * | 20.664 *** | 14.707 ** |
| | *0.000* | *0.000* | *0.000* | *0.064* | *0.000* | *0.047* |
| Seniority | -244.123 *** | -353.515 *** | -328.975 *** | -85.644 *** | -46.794 *** | -165.337 *** |
| | *0.000* | *0.000* | *0.000* | *0.001* | *0.002* | *0.000* |
| loan size to deal size | -103.702 *** | -80.860 *** | -74.209 *** | 6.717 | -85.151 *** | -68.512 *** |
| | *0.000* | *0.000* | *0.000* | *0.213* | *0.000* | *0.000* |
| Crisis | 35.955 *** | 34.685 ** | 31.932 * | 21.947 | 41.720 *** | 28.451 * |
| | *0.000* | *0.014* | *0.081* | *0.201* | *0.000* | *0.082* |
| Term loan | 70.098 *** | 61.450 *** | 77.343 *** | 2.056 | 61.098 *** | 0.000 *** |
| | *0.000* | *0.000* | *0.000* | *0.546* | *0.000* | *0.000* |
| Currency risk | 8.531 *** | 0.444 | 21.710 *** | 1.452 | 6.179 ** | 9.348 |
| | *0.000* | *0.910* | *0.000* | *0.874* | *0.022* | *0.390* |
| Rated | -238.281 *** | -278.017 *** | -220.680 *** | -207.144 *** | -239.275 *** | -318.388 *** |
| | *0.000* | *0.000* | *0.000* | *0.009* | *0.000* | *0.000* |
| Rated * rating | 19.128 *** | 17.109 *** | 17.176 *** | 18.609 ** | 21.385 *** | 19.814 *** |
| | *0.000* | *0.000* | *0.000* | *0.021* | *0.000* | *0.000* |
| Country risk | 9.932 *** | 13.904 *** | 14.931 *** | 18.607 *** | 10.835 *** | 5.142 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| Volatility | -0.426 *** | -0.487 * | -0.390 | -0.565 | -0.550 *** | 0.379 |
| | *0.001* | *0.070* | *0.185* | *0.120* | *0.000* | *0.268* |
| Risk free rate | -0.060 *** | -0.131 *** | -0.045 | -0.060 | -0.036 * | -0.101 ** |
| | *0.000* | *0.000* | *0.246* | *0.309* | *0.086* | *0.027* |
| 5YrTB-3mTB | -0.020 | -0.120 *** | -0.018 | -0.055 | 0.015 | -0.060 |
| | *0.198* | *0.000* | *0.595* | *0.336* | *0.440* | *0.245* |
| Fixed rate | 28.787 *** | 29.513 *** | 28.789 *** | 49.009 *** | 56.887 *** | -57.073 *** |
| | *0.000* | *0.002* | *0.000* | *0.000* | *0.000* | *0.000* |
| **Fixed effects** | | | | | | |
| Industry | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Year | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Region | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| R-Squared (adjusted) | 0.402 | 0.410 | 0.468 | 0.311 | 0.368 | 0.382 |
| Nr Observations | 101,738 | 25,009 | 20,975 | 7,336 | 56,884 | 14,557 |

Table 4 presents the results of OLS regressions analyzing the determinants of loan spread – model [1] – and total cost of borrowing (TCB) – model [2]. Model [1] reflects the high-information sample of 2,822 PF loans, 22,187 corporate control loans, 18,153 capital structure loans, 4,514 fixed asset based loans and 54,062 general corporate purpose loans. Model [2] isolates the 14,557 loans with available information on up-front fee. Models [1a] to [1d] focus on sub-samples created using the four non-PF loan categories. The spread is the sum of the spread paid by the borrower over Libor and the facility fee (all-in-spread-drawn). The TCB is the sum of the Libor spread, facility fee, and up-front fee divided by maturity, plus the annual fee. Project finance equals 1 if the loan is a PF loan and 0, otherwise. Maturity is the loan maturity, in years. Number of banks is the number of financial institutions participating in the transaction. Deal size is the transaction size measured in $US million. Distribution method equals 1 if the distribution method is classified as 'syndication' and 0, otherwise. Seniority equals 1 if the loan is senior and 0, otherwise. Loan size to deal size represents the ratio of the loan size to the transaction size. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December

31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Term loan equals 1 if the loan is a term loan and 0 if it is a credit line. Currency risk equals 1 for loans denominated in a different currency than that of the borrower's home country and 0, otherwise. Rated equals 1 if the loan has a credit rating and 0, otherwise. Rating is the S&P and Moody's rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Country risk is the S&P's country credit rating at closing date; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). Risk free rate is the yield on a 3-month U.S. Treasury bill. 5YrTB-3mTB is the difference between the yield on a five-year U.S. Treasury Bond and the yield on a 3-month U.S. Treasury Bill. Fixed rate equals 1 if the loan has a fixed coupon rate and 0, otherwise. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by deal. $^{***}$, $^{**}$ and $^{*}$ denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 5: PF versus non-PF loan cost of borrowing in the U.S. and W.E.**

| | [3a] PF vs Corporate control loans \| U.S. | [3b] PF vs Capital structure loans \| U.S. | [3c] PF vs Fixed asset based loans \| U.S. | [3d] PF vs General corporate purpose loans \| U.S. | [4a] PF vs Corporate control loans \| W.E. | [4b] PF vs Capital structure loans \| W.E. | [4c] PF vs Fixed asset based loans \| W.E. | [4d] PF vs General corporate purpose loans \| W.E. |
|---|---|---|---|---|---|---|---|---|
| **Dependent variable** | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) |
| Intercept | 405.209 *** | 408.216 *** | 314.398 *** | 350.652 *** | 666.104 *** | 635.428 *** | 327.312 *** | 356.540 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| Project Finance | -105.013 *** | -96.741 *** | 12.274 | -34.456 *** | -133.084 *** | -96.001 *** | -20.676 ** | -67.987 *** |
| | *0.000* | *0.000* | *0.173* | *0.000* | *0.000* | *0.000* | *0.049* | *0.000* |
| Maturity | 9.589 *** | 3.238 *** | -0.526 | 3.833 *** | 4.974 *** | 2.590 *** | 0.796 *** | 1.594 *** |
| | *0.000* | *0.000* | *0.374* | *0.000* | *0.000* | *0.000* | *0.002* | *0.000* |
| Number of banks | -4.996 *** | -3.059 *** | -1.286 ** | -2.819 *** | -1.135 *** | -2.434 *** | -0.538 | -3.038 *** |
| | *0.000* | *0.000* | *0.027* | *0.000* | *0.000* | *0.000* | *0.334* | *0.000* |
| Deal size | -0.016 *** | -0.036 *** | -0.014 ** | -0.029 *** | -0.009 *** | -0.001 | -0.009 | -0.010 *** |
| | *0.000* | *0.000* | *0.012* | *0.000* | *0.000* | *0.654* | *0.158* | *0.005* |
| Distribution method | 24.969 *** | 16.517 | 12.161 | 4.900 | 20.758 *** | 24.081 *** | 7.476 | 42.509 *** |
| | *0.010* | *0.130* | *0.308* | *0.301* | *0.000* | *0.000* | *0.198* | *0.000* |
| Seniority | -191.750 *** | -139.091 | -116.058 | -106.819 *** | -392.005 *** | -382.157 *** | -107.081 *** | -135.531 *** |
| | *0.000* | *0.187* | *0.152* | *0.004* | *0.000* | *0.000* | *0.001* | *0.000* |
| loan size to deal size | -100.374 *** | -104.669 *** | -42.671 *** | -95.647 *** | -66.442 *** | -82.223 *** | 7.020 | -98.140 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.267* | *0.000* |
| Crisis | 47.442 ** | 96.251 ** | 56.538 *** | 43.786 *** | 47.277 *** | 22.927 | 58.073 * | 46.922 ** |
| | *0.043* | *0.045* | *0.009* | *0.000* | *0.006* | *0.360* | *0.092* | *0.025* |
| Term loan | 72.645 *** | 105.800 *** | 7.565 ** | 67.698 *** | 41.398 *** | 63.167 *** | -12.937 * | 53.649 *** |
| | *0.000* | *0.000* | *0.041* | *0.000* | *0.000* | *0.000* | *0.080* | *0.000* |
| Currency risk | -55.076 *** | -99.250 *** | -170.987 *** | -63.809 *** | 14.451 *** | 3.832 | 11.144 | -1.819 |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.002* | *0.419* | *0.304* | *0.666* |
| Rated | -218.884 *** | -194.885 *** | -271.323 *** | -235.666 *** | -372.212 *** | -202.424 *** | -102.848 *** | -173.490 *** |
| | *0.000* | *0.000* | *0.001* | *0.000* | *0.000* | *0.000* | *0.000* | *0.002* |
| Rated * rating | 13.530 *** | 16.035 *** | 23.844 *** | 21.116 *** | 35.423 *** | 22.707 *** | 0.000 *** | 17.014 ** |
| | *0.000* | *0.000* | *0.002* | *0.000* | *0.001* | *0.000* | *0.000* | *0.015* |
| Country risk | 0.000 *** | 0.000 *** | 0.000 *** | 0.000 *** | 6.353 *** | 0.006 | 5.573 *** | 4.762 *** |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.997* | *0.001* | *0.000* |
| Volatility | -0.117 | -0.188 | -0.251 | -0.389 ** | -0.720 ** | -0.545 | -0.841 | -1.209 *** |
| | *0.737* | *0.666* | *0.510* | *0.021* | *0.047* | *0.231* | *0.165* | *0.003* |
| Risk free rate | -0.185 *** | -0.028 | 0.088 * | -0.028 | -0.071 | -0.070 | -0.200 * | -0.128 * |
| | *0.000* | *0.571* | *0.081* | *0.219* | *0.254* | *0.335* | *0.054* | *0.070* |
| 5YrTB-3mTB | -0.151 *** | -0.008 | 0.047 | 0.021 | -0.042 | -0.016 | -0.253 ** | -0.017 |
| | *0.000* | *0.855* | *0.423* | *0.330* | *0.510* | *0.815* | *0.019* | *0.811* |
| Fixed rate | 71.006 *** | 166.571 *** | 89.408 *** | 122.635 *** | 0.121 | 86.306 | 53.042 | 45.481 * |
| | *0.000* | *0.000* | *0.000* | *0.000* | *0.997* | *0.115* | *0.402* | *0.088* |
| **Fixed effects** | | | | | | | | |
| Industry | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Year | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| R-Squared (adjusted) | 0.371 | 0.554 | 0.282 | 0.374 | 0.578 | 0.601 | 0.512 | 0.542 |
| Nr Observations | 14,373 | 9,545 | 3,610 | 41,170 | 7,991 | 5,463 | 1,564 | 6,915 |

Table 5 presents the results of OLS regressions analyzing the determinants of PF and non-PF loan spreads. Models [3a] to [3d] reflect the high-information sub-samples of 655 PF loans, 13,718 corporate control loans, 8,890 capital structure loans, 2,955 fixed asset based loans and 40,515 general corporate purpose loans extended to U.S. borrowers. Models [4a] to [4d] focus on sub-samples created using loans arranged for borrowers located in W.E. – 1,154 PF loans, 6,837 corporate control loans, 4,309 capital structure loans, 410 fixed asset based loans and 5,761 general corporate purpose loans. The spread is the sum of the spread paid by the borrower over Libor and the facility fee (all-in-spread-drawn). Project finance equals 1 if the loan is a PF loan and 0, otherwise. Maturity is the loan maturity, in years. Number of banks is the number of financial institutions participating in the transaction. Deal size is the transaction size measured in $US million. Distribution method equals 1 if the distribution method is classified as 'syndication' and 0, otherwise. Seniority equals 1 if the loan is senior and 0, otherwise. Loan size to deal size represents the ratio of the loan size to the transaction size. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Term loan equals 1 if the loan is a term loan and 0 if it is a credit line. Currency risk equals 1 for loans denominated in a different currency than that of the borrower's home country and 0, otherwise. Rated equals 1 if the loan has a credit rating and 0, otherwise. Rating is the S&P and Moody's rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Country risk is the S&P's country credit rating at closing date; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). Risk free rate is the yield on a 3-month U.S. Treasury bill. 5YrTB-3mTB is the difference between the yield on a five-year U.S. Treasury Bond and the yield on a 3-month U.S. Treasury Bill. Fixed rate equals 1 if

the loan has a fixed coupon rate and 0, otherwise. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by deal. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 6: PF cost of borrowing: U.S. versus Europe**

| | [5] PF loans \| U.S. & W.E. | [6] PF loans \| U.S. & Continental Europe | [7] PF loans \| U.S. & U.K. |
|---|---|---|---|
| **Dependent variable** | Spread (bps) | Spread (bps) | Spread (bps) |
| Intercept | 317.225 *** | 293.776 ** | 439.060 *** |
| | *0.000* | *0.024* | *0.001* |
| U.S. Borrowers | 85.224 *** | 91.237 *** | 45.941 *** |
| | *0.000* | *0.000* | *0.004* |
| Maturity | 0.544 * | 0.347 | -1.043 |
| | *0.050* | *0.260* | *0.115* |
| Number of banks | -0.431 | -0.506 | -0.643 |
| | *0.420* | *0.309* | *0.387* |
| Deal size | -0.009 * | -0.008 | -0.014 ** |
| | *0.074* | *0.110* | *0.026* |
| Distribution method | -6.695 | -1.898 | -22.689 |
| | *0.337* | *0.787* | *0.202* |
| Seniority | -133.248 | -122.663 | -165.195 |
| | *0.103* | *0.332* | *0.140* |
| loan size to deal size | 15.753 ** | 21.729 *** | -8.879 |
| | *0.023* | *0.003* | *0.466* |
| Crisis | 34.733 | 33.843 | -53.520 |
| | *0.217* | *0.244* | *0.353* |
| Term loan | -8.042 | -11.738 * | 3.943 |
| | *0.238* | *0.093* | *0.651* |
| Currency risk | 27.032 * | 11.758 | 34.406 |
| | *0.078* | *0.457* | *0.320* |
| Rated | -274.964 ** | -291.960 ** | -131.761 |
| | *0.017* | *0.017* | *0.237* |
| Rated * rating | 23.982 ** | 24.803 ** | 10.040 |
| | *0.020* | *0.024* | *0.336* |
| Country risk | 8.791 *** | 11.317 *** | 2.740 |
| | *0.001* | *0.000* | *0.964* |
| Volatility | -0.263 | -0.048 | 0.650 |
| | *0.641* | *0.934* | *0.431* |
| Risk free rate | -0.016 | 0.015 | 0.221 * |
| | *0.831* | *0.840* | *0.066* |
| 5YrTB-3mTB | -0.019 | 0.017 | 0.121 |
| | *0.801* | *0.836* | *0.308* |
| Fixed rate | 98.483 ** | 98.771 ** | 127.382 *** |
| | *0.012* | *0.011* | *0.002* |
| **Fixed effects** | | | |
| Industry | *Yes* | *Yes* | *Yes* |
| Year | *Yes* | *Yes* | *Yes* |
| R-Squared (adjusted) | 0.465 | 0.503 | 0.362 |
| Nr Observations | 1,809 | 1,580 | 884 |

Table 6 presents the results of an OLS regression analysis of the determinants of PF loan spreads for: (*i*) a high-information sample of 655 and 1,154 PF loans extended to U.S. and W.E. borrowers, respectively – model [5]; (*ii*) a high-information sample of 655 and 925 PF loans extended to U.S. and Continental European borrowers, respectively – model [6]; and (iii) a high-information sample of 655 and 229 PF loans extended to U.S. and U.K. borrowers, respectively – model [7]. The spread is the sum of the spread paid by the borrower over Libor and the facility fee (all-in-spread-drawn). U.S. borrowers equals 1 if the loan is extended to a borrower located in the U.S. and 0, otherwise. Maturity is the loan maturity, in years. Number of banks is the number of financial institutions participating in the transaction. Deal size is the transaction size measured in $US million. Distribution method equals 1 if the distribution method is classified as 'syndication' and 0, otherwise. Seniority equals 1 if the loan is senior and 0, otherwise. Loan size to deal size represents the ratio of the loan size to the transaction size. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Term loan equals 1 if the loan is a term loan and 0 if it is a credit line. Currency risk equals 1 for loans denominated in a different currency than that of the

borrower's home country and 0, otherwise. Rated equals 1 if the loan has a credit rating and 0, otherwise. Rating is the S&P and Moody's rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Country risk is the S&P's country credit rating at closing date; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). Risk free rate is the yield on a 3-month U.S. Treasury bill. 5YrTB-3mTB is the difference between the yield on a five-year U.S. Treasury Bond and the yield on a 3-month U.S. Treasury Bill. Fixed rate equals 1 if the loan has a fixed coupon rate and 0, otherwise. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by deal. $^{***}$, $^{**}$ and $^{*}$ denote statistical significance at the 1%, 5% and 10% levels, respectively.

## Table 7: Estimates of the pricing models of PF loans

| | [8] PF loans \| U.S. | [9] PF loans \| W.E. | [10a] PF loans \| W.E.: pre-crisis | [10b] PF loans \| W.E.: crisis period |
|---|---|---|---|---|
| **Dependent variable** | Spread (bps) | Spread (bps) | Spread (bps) | Spread (bps) |
| Intercept | 421.186 * | 365.258 *** | 257.752 *** | 270.185 *** |
| | 0.097 | 0.000 | 0.000 | 0.000 |
| Loan size to deal size | -15.412 | 24.874 *** | 8.757 | 52.011 *** |
| | 0.321 | 0.000 | 0.133 | 0.000 |
| Deal size | -0.012 * | -0.017 ** | -0.003 | -0.009 |
| | 0.080 | 0.015 | 0.622 | 0.491 |
| Maturity | -2.471 *** | -1.182 *** | -0.634 | -0.843 |
| | 0.006 | 0.008 | 0.242 | 0.164 |
| Number of banks | -1.234 * | 0.713 | 0.597 | -2.223 |
| | 0.095 | 0,247 | 0.131 | 0.316 |
| Distribution method | 9.819 | -2.327 | 0.887 | -8.291 |
| | 0.675 | 0,727 | 0.880 | 0.478 |
| Seniority | -127.425 | -122.386 *** | -149.919 *** | 3.696 |
| | 0.608 | 0.003 | 0.000 | 0.823 |
| Crisis | 103.396 *** | 125.317 *** | | |
| | 0.000 | 0.000 | | |
| Term loan | -0.438 | -10.102 | -1.607 | -7.625 |
| | 0.964 | 0.326 | 0.817 | 0.726 |
| Risk free rate | -0.069 | -0.151 *** | -0.083 ** | -0.519 *** |
| | 0,223 | 0.004 | 0.042 | 0.002 |
| Volatility | -1.763 ** | -1.439 *** | 0.343 | -0.414 |
| | 0,022 | 0.000 | 0.464 | 0.515 |
| 5YrTB-3mTB | -0.189 * | -0.161 ** | -0.006 | 0.177 |
| | 0,051 | 0.048 | 0.931 | 0.193 |
| Rated | -105.833 | | | |
| | 0,447 | | | |
| Rated * Rating | 8.303 | | | |
| | 0,510 | | | |
| Fixed rate | 131,478 *** | -9,758 | 276,389 *** | -52,419 |
| | 0.004 | 0.840 | 0.000 | 0.240 |
| U.K. Borrowers | | | 36,499 *** | 44,876 ** |
| | | | 0.000 | 0.025 |
| Country risk | | | 2,201 | 9,433 *** |
| | | | 0.331 | 0.006 |
| Currency risk | | | 24,797 * | 40,655 |
| | | | 0.076 | 0.176 |
| Industry fixed effects | *Yes* | *Yes* | *Yes* | *Yes* |
| **Dependent variable:** Probability of observing: | PF vs Non-PF loans: U.S. | PF vs Non-PF loans: W.E. | PF vs Non-PF loans: W.E. \| pre-crisis | PF vs Non-PF loans: W.E. \| crisis |
| Deal size | -0.001 | -0.001 *** | -0.001 *** | -0.001 |
| | 0.756 | 0.000 | 0.000 | 0.131 |
| Maturity | 0.115 *** | 0.166 *** | 0.159 *** | 0.180 *** |
| | 0.000 | 0.000 | 0.000 | 0.000 |
| Crisis | -0.159 ** | 0.612 *** | | |
| | 0.041 | 0.000 | | |
| Risk free rate | 0.001 *** | 0.001 | -0.001 | -0.002 * |
| | 0.000 | 0.254 | 0.788 | 0.089 |
| Volatility | 0.018 *** | 0.017 *** | 0.020 *** | 0.020 *** |
| | 0.000 | 0.000 | 0.000 | 0.000 |
| 5YrTB-3mTB | 0.001 *** | 0.001 | -0.002 ** | 0.003 *** |
| | 0.000 | 0.855 | 0.047 | 0.001 |
| U.K. Borrowers | | | -0,275 *** | -0,117 |
| | | | 0.000 | 0.314 |
| Country risk | | | 0.107 *** | 0.060 *** |
| | | | 0.001 | 0.000 |
| Currency risk | | | -0.118 | -0.407 *** |
| | | | 0.186 | 0.000 |
| Number of observations | 66,733 | 18,405 | 12,986 | 5,394 |
| Censored observations | 66,078 | 17,251 | 12,345 | 4,881 |
| Uncensored observations | 655 | 1,154 | 641 | 513 |
| rho | -0.093 | -0.221 | -0.222 | -0.095 |
| Wald test (rho=0) PI-value | 0.063 | 0.000 | 0.013 | 0.138 |
| Log likelihood | -7,323.761 | -9,577.298 | -5,090.127 | -4,145.035 |

Table 7 presents the results of estimating a Heckman (1979) selection model on: (*i*) a sample of 66,733 syndicated loans extended to U.S. borrowers, of which 655 are classified as PF loans – model [8]; (*ii*) a sample of 18,405 syndicated loans extended to W.E. borrowers, of which 1,154 are classified as PF loans – model [9]; and (*iii*) two sub-samples of syndicated loans extended to W.E. borrowers created by considering a pre-crisis period from January 1, 2000 through to September 14, 2008, and a crisis period from September 15, 2008 (Lehman Brothers' bankruptcy filing date) through to December 31, 2014 – models [10a] and [10b]. The spread is the sum of the spread paid by the borrower over Libor and the facility fee (all-in-spread-drawn). Loan size to deal size represents the ratio of the loan size to the transaction size. Deal size is the transaction size measured in $US million. Maturity is the loan maturity, in years. Number of banks is the number of financial institutions participating in the transaction. Distribution method equals 1 if the distribution method is classified as 'syndication' and 0, otherwise. Seniority equals 1 if the loan is senior and 0, otherwise. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Term loan equals 1 if the loan is a term loan and 0 if it is a credit line. Risk free rate is the yield on a 3-month U.S. Treasury bill. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). 5YrTB-3mTB is the difference between the yield on a five-year U.S. Treasury Bond and the yield on a 3-month U.S. Treasury Bill. Rated equals 1 if the loan has a credit rating and 0, otherwise. Rating is the S&P and Moody's rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Fixed rate equals 1 if the loan has a fixed coupon rate and 0, otherwise. U.K. borrowers equals 1 if the loan is extended to a borrower located in the U.K. and 0, otherwise. Country risk is the S&P's country credit rating at closing date; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Currency risk equals 1 for loans denominated in a different currency than that of the borrower's home country and 0, otherwise. We perform maximum likelihood estimations on our spread samples simultaneously with a probit selection equation. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by deal. $^{***}$, $^{**}$ and $^{*}$ denote statistical significance at the 1%, 5% and 10% levels, respectively.

## Table 8: Descriptive statistics for public firms

| Variable of interest | Firms categorized according to choice of debt \| All loans | | Firms categorized according to choice of debt \| W.E. | | Firms categorized according to choice of debt \| U.S. | |
|---|---|---|---|---|---|---|
| | [I] PF loans (N =470) | [II] Non-PF loans (N =25.838) | [I] PF loans (N =385) | [II] Non-PF loans (N =6.148) | [I] PF loans (N =85) | [II] Non-PF loans (N =19.690) |
| **Total assets (in $US million)** | 33,525.36 | 9,505.42 | 38,976.77 | 11,490.32 | 8,833.67 | 8,885.65 |
| | (6,301.29) * | (1,530.51) | (8,234.20) * | (2,326.37) | (2,915.33) * | (1,317.25) |
| **Debt to total assets** | 35.23% | 37.15% | 35.06% | 31.51% | 36.00% | 38.91% |
| | (33.39%) * | (30.32%) | (32.59%) * | (29.37%) | (39.30%) | (30.69%) |
| **Short-term debt to total debt** | 38.26% | 22.57% | 42.65% | 30.85% | 17.45% | 19.88% |
| | (21.97%) * | (10.53%) | (24.75%) * | (20.71%) | (10.06%) | (7.82%) |
| **Fixed assets to total assets** | 40.20% | 35.58% | 37.94% | 34.03% | 50.40% | 36.07% |
| | (41.04%) * | (28.44%) | (39.05%) * | (28.03%) | (54.91%) * | (28.70%) |
| **Market to book ratio** | 3.50 | 7.23 | 3.46 | 4.24 | 3.68 | 8.15 |
| | (2.66) | (2.48) | (2.59) * | (2.24) | (2.80) | (2.55) |
| **Return on assets** | 1.70% | 5.25% | 1.86% | 4.94% | 0.90% | 5.34% |
| | (3.38%) * | (5.08%) | (3.33%) * | (5.14%) | (3.57%) * | (5.05%) |

Our sample includes 470 PF deals and 25,838 non-PF deals closed by 6,381 publically traded firms located in W.E. and the U.S. between 2000 and 2014. W.E. sub-sample includes 385 PF deals and 6,148 non-PF deals closed by 1,963 publically traded firms, while U.S. sub-sample includes 85 PF deals and 19,690 non-PF deals closed by 4,418 publically traded firms. Each cell contains means and parenthetic medians. We test for similar distributions in public firms' characteristics across samples via the Wilcoxon rank-sum test. * denotes statistical difference at the 5% level between 'PF loans' and 'Non-PF loans' samples. Short-term debt includes debt maturing within 1 year. Market to book ratio is defined as the sum of book value of liabilities and market value of equity divided by the book value of assets. Return on assets is defined as net income before preferred dividends minus preferred dividend requirement, divided by total assets.

## Table 9: Determinants of public firms' debt choice

| **Dependent variable:** | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 |
|---|---|---|---|---|---|---|---|---|---|
| Choice of debt | [11] All loans | [11a] All loans \| Pre-crisis period | [11b] All loans \| Crisis period | [12] W.E. | [12a] W.E. \| Pre-crisis period | [12b] W.E. \| Crisis period | [13] U.S. | [13a] U.S. \| Pre-crisis period | [13b] U.S. \| Crisis period |
| **Independent variables:** | | | | | | | | | |
| Intercept | -10.994 *** (0.00) | -8.074 *** (0.00) | -12.339 *** (0.00) | -10.540 *** (0.00) | -6.699 *** (0.00) | -11.269 *** (0.00) | -7.245 *** (0.00) | -7.652 *** (0.00) | -6.801 *** (0.00) |
| Log total assets | 0.344 *** (0.00) | 0.314 *** (0.00) | 0.518 *** (0.00) | 0.337 *** (0.00) | 0.328 *** (0.00) | 0.495 *** (0.00) | -0.135 * (0.09) | -0.202 (0.13) | -0.045 (0.78) |
| Debt to total assets | 0.047 (0.78) | 0.036 (0.89) | 0.276 (0.24) | 0.582 *** (0.01) | 0.413 * (0.09) | 1.337 ** (0.01) | -0.847 (0.18) | -0.903 (0.26) | -0.711 (0.48) |
| Short-term debt to total debt | 0.408 * (0.09) | 0.808 *** (0.00) | 0.248 *** (0.00) | 0.268 *** (0.00) | 0.490 ** (0.01) | 0.218 *** (0.00) | -0.500 (0.45) | -0.482 (0.59) | -0.732 (0.40) |
| Fixed assets to total assets | 0.731 *** (0.00) | 0.788 *** (0.00) | 0.301 (0.22) | 1.048 *** (0.00) | 1.147 *** (0.00) | 0.557 * (0.09) | 1.298 *** (0.00) | 1.687 ** (0.02) | 0.631 (0.21) |
| Market to book ratio | 0.000 (0.16) | -0.001 (0.15) | 0.000 (0.18) | 0.000 (0.80) | -0.003 (0.18) | 0.000 (0.62) | 0.000 (0.61) | -0.002 (0.46) | 0.000 (0.57) |
| Return on assets | -0.432 *** (0.00) | -0.259 (0.52) | -0.459 *** (0.00) | -0.927 *** (0.00) | -0.667 *** (0.00) | -4.170 *** (0.00) | -0.340 ** (0.02) | -1.183 ** (0.02) | -0.412 * (0.05) |
| Log deal size | -0.420 *** (0.00) | -0.372 *** (0.00) | -0.681 *** (0.00) | -0.381 *** (0.00) | -0.412 *** (0.00) | -0.595 *** (0.00) | -0.316 *** (0.00) | -0.224 (0.20) | -0.337 (0.10) |
| Maturity | 0.351 *** (0.00) | 0.335 *** (0.00) | 0.359 *** (0.00) | 0.279 *** (0.00) | 0.257 *** (0.00) | 0.301 *** (0.00) | 0.375 *** (0.00) | 0.343 *** (0.00) | 0.453 *** (0.00) |
| Country risk | 0.077 *** (0.00) | 0.107 ** (0.03) | 0.073 *** (0.00) | 0.039 ** (0.05) | 0.135 ** (0.04) | 0.055 ** (0.02) | | | |
| Currency risk | -0.786 *** (0.00) | -1.226 *** (0.00) | -0.165 (0.41) | -1.168 *** (0.00) | -1.655 *** (0.00) | -0.596 *** (0.00) | 2.293 *** (0.00) | -11.853 *** (0.00) | 2.402 *** (0.00) |
| Crisis | 0.753 *** (0.00) | | | 1.570 *** (0.00) | | | 1.118 ** (0.03) | | |
| Volatility | 0.041 *** (0.00) | 0.032 *** (0.00) | 0.034 *** (0.00) | 0.014 ** (0.02) | 0.012 (0.33) | 0.008 (0.31) | 0.056 *** (0.00) | 0.103 *** (0.00) | 0.030 * (0.07) |
| Switcher | 2.681 *** (0.00) | 2.893 *** (0.00) | 2.322 *** (0.00) | 1.721 *** (0.00) | 1.914 *** (0.00) | 1.515 *** (0.00) | 5.749 *** (0.00) | 6.206 *** (0.00) | 5.260 *** (0.00) |
| U.K. Borrowers | 0.162 (0.33) | -0.303 (0.27) | 0.800 *** (0.00) | -0.706 *** (0.00) | -1.165 *** (0.00) | 0.072 (0.73) | | | |
| Risk free rate | 0.001 ** (0.04) | -0.004 *** (0.00) | -0.001 (0.85) | 0.005 *** (0.00) | -0.002 (0.17) | 0.005 *** (0.00) | 0.002 (0.21) | 0.001 (0.48) | 0.018 * (0.09) |
| 5YrTB-3mTB | 0.001 (0.22) | -0.009 *** (0.00) | 0.008 *** (0.00) | 0.005 *** (0.00) | -0.012 *** (0.00) | 0.011 *** (0.00) | -0.003 (0.28) | -0.005 (0.23) | -0.003 (0.51) |
| Industry fixed effects | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Number of observations | 34,712 | 21,297 | 13,415 | 9,690 | 5,151 | 4,539 | 24,698 | 15,962 | 8,736 |
| Wald statistic | 1,722.867 *** | 882.072 *** | 789.996 *** | 995.355 *** | 411.202 *** | 607.266 *** | 581.367 *** | 820.642 *** | 309.600 *** |
| Correct predictions | 89.55% | 89.27% | 92.59% | 89.24% | 88.50% | 93.15% | 88.35% | 91.62% | 88.91% |
| R-Squared | 0.088 | 0.071 | 0.121 | 0.188 | 0.168 | 0.236 | 0.025 | 0.023 | 0.029 |
| Max rescaled R-Squared | 0.466 | 0.448 | 0.522 | 0.485 | 0.467 | 0.567 | 0.511 | 0.546 | 0.503 |

Table 9 presents results of logistic regressions which predict public firms' choice between project financing and corporate financing. The dependent variable equals 1 when a firm selects PF lending and 0 when it chooses corporate financing. In model [11] we include all syndicated loans; while in models [12] and [13] we include loans extended to borrowers located in W.E. and the U.S., respectively. Models [11a] and [11b], [12a] and [12b], and [13a] and [13b] investigate, separately, the pre-crisis (January 1, 2000 through to September 14, 2008) and crisis (September 15, 2008 through to December 31, 2014) sub-periods. Log total assets is the natural logarithm of firm total assets measured in $US million. Short-term debt measures debt maturing within 1 year. Market to book ratio is defined as the sum of book value of liabilities and market value of equity divided by the book value of assets. Return on assets is defined as net income before preferred dividends minus preferred dividend requirement, divided by total assets. Log deal size is the natural logarithm of the transaction size measured in $US million. Maturity is the maturity of loans, in years. Country risk is the S&P's country credit rating at closing; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Currency risk equals 1 for debt denominated in a different currency than that of the borrower's home country and 0, otherwise. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Volatility is the Chicago Board Options Exchange Volatility Index (VIX). Switcher is an indicator variable equal to 1 if firms used both loan instrument types within our sample period and 0, otherwise. U.K. Borrowers equals 1 if the loan is extended to a borrower located in the U.K. and 0, otherwise. Risk free rate is the yield on a three-month U.S. Treasury bill (models [11], [11a], [11b], [13], [13a] and [13b]) or the yield on a three-month German Treasury bill (models [12], [12a] and [12b]). 5YrTB-3mTB is the difference between the yield on a five-year treasury bond and the yield on a three-month treasury bill. The z-statistics reported in parentheses are based on heteroskedasticity-consistent standard errors clustered by deal. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

**Table 10: Descriptive statistics for private firms**

| Variable of interest | Firms categorized according to choice of debt \| All loans | | Firms categorized according to choice of debt \| W.E. | |
|---|---|---|---|---|
| | [I] PF loans (N =59) | [II] Non-PF loans (N =2.031) | [I] PF loans (N =59) | [II] Non-PF loans (N =1.721) |
| **Total assets (in $US million)** | 1,088.98 | 1,905.29 | 1,088.98 | 1,702.70 |
| | (170.81) * | (312.79) | (170.81) * | (353.83) |
| **Debt to total assets** | 66.18% | 70.84% | 66.18% | 70.31% |
| | (71.67%) | (70.91%) | (71.67%) | (71.42%) |
| **Fixed assets to total assets** | 54.22% | 52.42% | 54.22% | 52.73% |
| | (61.67%) | (55.55%) | (61.67%) | (55.46%) |
| **Return on assets** | -0.34% | 4.91% | -0.34% | 4.82% |
| | (0.10%) * | (2.33%) | (0.10%) * | (2.34%) |

Our sample includes 59 PF deals and 2,031 non-PF deals closed by 1,107 privately held firms located in W.E. and the U.S. between 2000 and 2014. W.E. sub-sample includes 59 PF deals and 1,721 non-PF deals closed by 984 privately held firms. Each cell contains means and parenthetic medians. We test for similar distributions in public firms' characteristics across samples via the Wilcoxon rank-sum test. * denotes statistical difference at the 5% level between 'PF loans' and 'Non-PF loans' samples. The ratio debt to total assets was computed as total liabilities to total assets. Return on assets is defined as net income before preferred dividends minus preferred dividend requirement, divided by total assets.

## Table 11: Determinants of private firms' debt choice

| **Dependent variable:** | PF loan = 1, Non-PF loan = 0 | PF loan = 1, Non-PF loan = 0 |
|---|---|---|
| Choice of debt | [14] W.E. | [14a] W.E. |
| **Independent variables:** | | |
| Intercept | -9.874 *** (0.00) | -4.852 *** (0.00) |
| Log total assets | | -0.282 *** (0.00) |
| Debt to total assets | | 0.683 (0.12) |
| Fixed assets to total assets | | 0.757 (0.14) |
| Return on assets | | -3.836 *** (0.00) |
| Log deal size | 0.311 *** (0.00) | 0.029 (0.74) |
| Maturity | 0.274 *** (0.00) | 0.196 *** (0.00) |
| Country risk | 0.138 *** (0.01) | 0.030 (0.71) |
| Currency risk | -0.230 (0.49) | -0.482 (0.31) |
| Crisis | 1.562 *** (0.00) | 2.355 *** (0.00) |
| Volatility | 0.011 (0.35) | -0.010 (0.58) |
| Switcher | | 4.511 *** (0.00) |
| U.K. Borrowers | 0.314 (0.16) | 1.069 *** (0.00) |
| Risk free rate | 0.004 ** (0.02) | 0.004 ** (0.03) |
| 5YrTB-3mTB | 0.008 *** (0.00) | 0.009 *** (0.00) |
| Industry fixed effects | *Yes* | *Yes* |
| Number of observations | 3,365 | 3,077 |
| Wald statistic | 203.542 *** | 283.173 *** |
| Correct predictions | 77.26% | 92.90% |
| R-Squared | 0.067 | 0.115 |
| Max rescaled R-Squared | 0.256 | 0.501 |

Table 11 presents results of logistic regressions which predict private firms' choice between project financing and corporate financing. The dependent variable equals 1 when a firm selects PF lending and 0 when it chooses corporate financing. Log total assets is the natural logarithm of firm total assets measured in $US million. Debt to total assets is defined as total liabilities to total assets. Return on assets is defined as net income before preferred dividends minus preferred dividend requirement, divided by total assets. Log deal size is the natural logarithm of the transaction size measured in $US million. Maturity is the maturity of loans, in years. Country risk is the S&P's country credit rating at closing; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Currency risk equals 1 for debt denominated in a different currency than that of the borrower's home country and 0, otherwise. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise (January 1, 2000 – September 14, 2008). Volatility is the Chicago Board Options Exchange Volatility Index (VIX). Switcher is an indicator variable equal to 1 if firms used both loan instrument types within our sample period and 0, otherwise. U.K. Borrowers equals 1 if the loan is extended to a borrower located in the U.K. and 0, otherwise. Risk free rate is the yield on a three-month German Treasury bill. 5YrTB-3mTB is the difference between the yield on a five-year treasury bond and the yield on a three-month treasury bill. The z-statistics reported in parentheses are based on heteroskedasticity-consistent standard errors clustered by deal. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.