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Nº 01/2018

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January 30, 2018

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Key words: debt financing choice, security design, off-balance sheet financing, project finance, asset securitization, corporate bonds.

JEL classification: F34; G01; G12; G21; G24

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We examine the factors that influence non-financial firms' choice between corporate financing (CF) and structured finance (SF). Using a sample of 4,970 Western European deals closed between 2000 and 2016, we find that floatation costs, information asymmetry, and renegotiation and liquidation risks affect firms' financing decisions. Findings also suggest that firms choose SF when they are less creditworthy and seek long-term financing, and that firms resorting to project finance are smaller and less profitable and have lower short-term debt, lower asset tangibility, and less growth opportunities than corporate bond issuers have. Firms that prefer asset securitization to corporate bonds tend to be smaller, more levered, and less profitable and have lower proportions of fixed assets. Finally, findings are consistent with the hypothesis that firms choose asset securitization to reduce funding costs.

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The Choice between Corporate and Structured Financing: Evidence from New Corporate Borrowings

1. Introduction

Corporate financial structure arrangements go well beyond the choice of the debt-equity mix, encompassing also, within the debt securities category, security design features, such as placement structure, maturity structure, and on- or off-balance sheet financing, as is the case of structured financed (SF) transactions such as project finance and asset securitization.

Despite the market relevance, both in terms of number and aggregated market value of SF issuances in the last decades,[1] prior research on corporate debt financing choice focused primarily on the choice between bank financing and bond financing [Diamond (1991b), Chemmanur and Fulghieri (1994), Houston and James (1996), Johnson (1997), Krishnaswami et al. (1999), Cantillo and Wright (2000), Denis and Mihov (2003), Altunbas *et al.* (2010)].

Albeit that this stream of literature makes predictions about the relationship between debt source preferences and firm characteristics, it has devoted little attention to the choice between on-balance sheet and off-balance sheet financing. In addition, despite insightful predictions from the security design literature, the choice between SF and corporate financing (CF) has received relatively little academic analysis. Therefore, this important firm decision remains an empirical question.

The paper aims at filling this gap in the literature examining how firms choose between CF and SF transactions. SF is related to the design of financial instruments based on the use of contracting mechanisms to off-balance sheet financing of a specified asset (or pool of assets), meeting, as closely as possible, the needs and expectations of its originator/owner, and

[1] Considering project finance funding, in 2016, $62.6 billion and $33.8 billion were arranged in W.E. and the U.S., respectively – $230.9 billion arranged worldwide during 2016, which compares with $217 billion reported for 2001 [Esty and Sesia (2007)]. According to Thomson Reuters, in comparison with other financing mechanisms, the project finance market – in both W.E. and the U.S. – was smaller than both the corporate bond and the asset securitization markets in 2016. However, the amount invested in project finance was larger than the amounts raised through IPOs or venture capital funds.

investors' expected return [Fabozzi *et al.* (2006) and Leland (2007)]. For our study, SF includes project finance and asset securitization deals while CF refers to corporate bond deals.[2]

It is a truism saying that, in an economy *à la* Modigliani and Miller (1958), the decision between CF and SF is irrelevant. In this framework, tranching,[3] or the act of encapsulating an initiative or a pool of assets in an *ad hoc* organization, would, consequently, not matter also. By implication, market imperfections and frictions of different nature, would make tranching and off-balance sheet financing relevant.[4]

Prior theoretical research on firm debt choices, addresses the coexistence of bank and bond financing [Diamond (1991b), Rajan (1992), Chemmanur and Fulghieri (1994), Yosha (1995), Bolton and Freixas (2000), and Fiore and Uhlig (2011)]. While some authors argue that bank financing holds a significant advantage [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. Although this literature relates debt source preferences and firm characteristics, it pays little attention to the choice between structured and traditional corporate debt financing instruments.

Additionally, in the related empirical literature, this debt financing choice is also an under-researched topic. Although, Houston and James (1996), Johnson (1997), Krishnaswami *et al.* (1999), Cantillo and Wright (2000), Denis and Mihov (2003), and Altunbas *et al.* (2010) examine the debt choice generic topic, the main focus of their papers relates the use of public bonds to borrowers' characteristics, such as size, age, leverage, liquidity, growth opportunities,

[2] Asset securitization, project finance, structured leasing, and leveraged acquisitions (mostly LBOs), are all different forms of SF. In our study, we rely on project finance and asset securitization because there is no public information on structured leasing transactions and some LBOs are implemented without an SPV to facilitate the deal, which is a key element of SF [see, among others, Roever and Fabozzi (2003), Caselli and Gatti (2005), and Fabozzi *et al.* (2006)].

[3] Tranching means the creation of multiple types of securities backed by firm's assets, or by the underlying asset pool, when considering asset securitization. See DeMarzo (2005) and Leland (2007) for further details.

[4] Finnerty (1988), Oldfield (1997), Caselli and Gatti (2005), DeMarzo (2005), and Fabozzi *et al.* (2006) document that SF mitigates agency problems and information asymmetries, and improves risk management, suggesting that SF does matter because it reduces the deadweight costs associated with market frictions and imperfections.

and profitability. The focus of our paper, however, investigates a different debt financing choice: SF *versus* CF. Perhaps the most closely related work to ours is Altunbas *et al.* (2010), which investigates factors relevant to European firms' choices between corporate bonds and syndicated loans, disregarding project finance deals.

In this paper, we contribute to this literature by investigating the determinants of the choice between CF and SF. We use a comprehensive sample of project finance, asset securitization, and corporate bond deals closed in Western European countries between January 1, 2000 and December 31, 2016. Our sample contains 582 project finance deals (worth €149.77 billion), 170 asset securitization deals (worth €130.73 billion), and 4,218 corporate bond deals (worth €2,778.13 billion), closed by 240, 77, and 791 non-financial firms, respectively.

Our results regarding corporate borrower choice between SF and CF transactions support hypotheses related to information asymmetry, floatation cost, and renegotiation and liquidation risks. We find that corporate borrowers choose SF when they seek long-term financing and are less creditworthy. Further, firms employing project financing over corporate financing tend to be smaller, less profitable and have lower short-term debt to total debt, lower asset tangibility, and less growth opportunities. Firms prefer project financing when issuing relatively lower amounts of debt and are located in countries with higher creditor rights. Firms employing asset securitizations instead of corporate bonds are typically smaller, more levered and less profitable; these firms also tend to have lower asset tangibility. Corporates seeking relatively higher amounts of debt and funding cost reductions prefer asset securitizations. Moreover, firms that access both SF and CF markets differ fundamentally from those reliant on either market, alone. Finally, we show that transaction cost considerations lead firms that use both SF and CF during our sample period to choose SF for new debt.

In line with SF literature, our results indicate that, *ceteris paribus*, the weighted average spread (WAS) is significantly lower for AS deals than for CF ones. When compared with

corporate bond deals, asset securitization deals are associated with a statistically significant WAS reduction of 91.12 bps. Our results do not corroborate the hypothesis raised by the SF literature that the funding cost on SF is lower than the funding cost on CF for project finance transactions.

This paper extends the literature on debt financing decisions in several ways. First, unlike prior research, our empirical analysis distinguishes between SF and CF. SF is an economically significant, growing financial market segment, but academic papers that have dealt with the subject are very limited. As such, it warrants separate examination. In 2014, a joint paper prepared by the Bank of England and the ECB points to the need for a better functioning of SF and securitization market in the European Union due to its important role as a funding alternative to traditional bank credit. The European Commission is boosting infrastructure investments, and by doing so is supporting the use of project finance, to fund a 2 trillion-euro investment between 2017 and 2020. Second, to our knowledge, this study is the first to investigate factors underlying firm choices between on- and off-balance sheet funding by analyzing firm issuance of corporate bonds *versus* asset securitization bonds and the choice between CF and project financing. Third, our study explores for the first time why corporates use asset securitization. Fourth, unlike prior studies on debt choice, we examine the choice of new debt, rather than the proportions of existing bank and bond financing. We investigate debt choices using a unique dataset of CF and SF deals carefully assembled and hand-matched from multiple sources. Finally, unlike prior studies, we examine the impact of the cost of funding on the debt choice.

The remainder of this paper is organized as follows. The next section discusses theoretical and empirical background regarding SF and connects it with security design and debt choice literatures. Section 3 presents our methodology and data. This section also characterizes our sample of deals and describes the firm's accounting and market

characteristics. Section 4 examines the determinants of firm debt choices and discusses our robustness checks. Section 5 examines if SF deals have a lower cost of funding than corporate bond deals. Section 6 summarizes and concludes.

2. Theoretical background and hypotheses

2.1. The financial economics of structured finance

SF transactions are usually designed, namely in terms of covenants, warrantees, governance structure, and trusts, to achieve segregation of the pool of assets or cash flows, from the originator or sponsor of the transaction. This is achieved by setting up a vehicle company created with the sole purpose of implementing the transaction. Additionally, credit enhancement mechanisms are also implemented, such as the use of warrantees to enhance recoveries, and tranching to define risk attachment points [DeMarzo (2005) and Leland (2007)].

According to extant literature, the primary motives for using SF include: (*i*) mitigating costs of market imperfections and frictions; (*ii*) funding projects which otherwise could not be financed; (*iii*) reducing funding costs, when the reduction in the cost of funding is larger than the cost of the required credit enhancements; (*iv*) maintaining sponsors' financial slack; (*v*) transferring risk more effectively; and (*vi*) reducing tax liability through tax shields [Esty (2003), Caselli and Gatti (2005), DeMarzo (2005), and Fabozzi *et al.* (2006)]. The literature also documents that SF is prone to inefficiencies, particularly, when used inappropriately or imprudently.[5]

Project finance (PF) structures are typically used for funding capital-intensive facilities and utilities, based on a standalone entity, a special purpose vehicle (SPV), typically highly

[5] As argued by Brunnermeier (2009), Coval *et al.* (2009), Gorton (2009), and Gorton and Metrick (2013), securitization complex structures played an important role in the development and propagation of the 2007-2008 financial crisis.

levered, and financial claims concentrated ownership. Due to their contractual idiosyncrasies, they can also be used for segregating projects' credit risk from the sponsors' [e.g., Brealey *et al.* (1996), Esty (2003), and Corielli *et al.* (2010)].

Asset securitization (AS) structures allow that cash flow generating assets being pooled together and transferred to a specially set up entity which, subsequently, issues securities in the form of debt instruments [Roever and Fabozzi (2003), Fabozzi *et al.* (2006), and Gorton and Metrick (2013)]. According to Fabozzi *et al.* (2006), the reasons a non-financial borrowers may elect to issue an ABS are: (*i*) mitigating the deadweight costs associated with asymmetric information and agency problems; (*ii*) improving liquidity and diversify funding sources; and (*iii*) maintaining sponsors' financial flexibility.

2.2. Determinants of firms' debt choices

To date, the choice between SF and CF has been relatively underlooked in the debt financing literature, which focuses primarily on the choice between public and private debt. That literature clusters around three main hypotheses. The flotation costs hypothesis, which posits that because small public debt issues are not cost-efficient, firms issue public bonds only for larger borrowings [Houston and James (1996), Krishnaswami *et al.* (1999), Esho *et al.* (2001), and Denis and Mihov (2003)]. The renegotiation and liquidation hypothesis, which predicts that borrowers with a higher probability of financial distress are far less likely to borrow publicly [Berlin and Loyes (1988), Chemmanur and Fulghieri (1994), Cantillo and Wright (2000), Esho *et al.* (2001), Denis and Mihov (2003), and Fiore and Uhlig (2011)]. The information asymmetry hypothesis, which suggests that firms facing higher incentives from asymmetric information, are expected to borrow privately [Diamond (1984, 1991b), Boyd and Prescott (1986), Krishnaswami *et al.* (1999), Denis and Mihov (2003), and Fiore and Uhlig (2011)].

Finally, security design literature is also potentially relevant in explaining borrowers' decisions to resort to SF transactions. Diamond (1993), as hypothesized in Allen and Winton (1995), Hart and Moore (1995), Winton (1995), and Sannikov (2013), argues that the design and issuance of debt securities with different degrees of seniority, can mitigate agency problems and reduce monitoring costs.

2.3. Hypotheses

The literature review helps us to develop the following three hypotheses with respect to the choice between SF and CF.

Active monitoring by a lender can be helpful in mitigating agency costs associated with moral hazard [Diamond (1984, 1991b)]. Thus, as argued in Diamond (1984) and Boyd and Prescott (1986), banks may be more efficient monitors than public bond markets. In this framework, when information about the *true* quality of a borrower is asymmetrically distributed, bank loans may be preferred to corporate bonds (CB). We thus expect firms facing high information asymmetry costs to choose PF because banks can more efficiently reduce such costs through monitoring. Additionally, Diamond (1993), Hart and Moore (1995), and Winton (1995) argue that in AS, the design and issuance of different classes of securities with different degrees of seniority may reduce monitoring costs. Finally, Flannery (1986) and Diamond (1991a, 1993) point out that short-term debt can reduce adverse selection costs of new debt issues, since its higher frequency of repricing (compared to longer maturity debt) allows an earlier incorporation of incoming new information. Thus, similarly to Flannery (1986) and Diamond (1991a) predictions, we expect borrowers seeking to minimize liquidity risk costs associated with debt refinancing, will choose longer-term borrowing; i.e., will prefer SF to CF.

Hypothesis 1 [H1]: The use of SF reduces asymmetric information problems and enables borrowers to obtain funding with longer maturities.

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. This might suggest that firms may choose PF over CB for relatively small amounts of debt. However, considering that structuring a PF transaction is costlier than CF – PF transaction are expensive to set up, take a long time to execute, and are highly restrictive once in place [Fabozzi *et al.* (2006) and Gatti *et al.* (2013)] –, we also expect that relatively small PF transactions would also not be cost-effective. Similarly, Fender and Mitchell (2005) and Fabozzi *et al.* (2006) point out that AS transactions have higher transaction costs *vis-à-vis* CB. Thus, we expect borrowers to choose AS for relatively large debt borrowings because of potential economies of scale on flotation costs.

Hypothesis 2 [H2]: Borrowers choose SF over CF when issuing relatively large amounts of debt.

The renegotiation and liquidation hypothesis suggests that borrowers facing higher financial distress probability are less likely to borrow publicly, since renegotiation may be less complicated using bank debt [Berlin and Loyes (1988) and Chemmanur and Fulghieri (1994), Esho *et al*. (2001), and Altunbas *et al.* (2010)]. Because of restrictive covenants, direct credit monitoring, and *ex post* renegotiation, SF transactions resemble more closely private placement bonds than (publicly offered) CB [Kwan and Carleton (2010)]. These characteristics make SF more effective in mitigating agency conflicts between borrowers and lenders. Thus, SF transactions seem particularly well suited for risky borrowers with high agency costs of debt. Finally, considering that both PF loans and AS bonds are off-balance sheet transactions, we predict that higher levered firms will choose SF over CF to improve or maintain key financial ratios [Caselli and Gatti (2005) and Fabozzi *et al.* (2006)].

Hypothesis 3 [H3]: Risky firms with high agency costs of debt are more likely to choose PF and AS over CB.

3. Methodology, data, and sample characterization

3.1. Methodology

The main objective of our analysis is to study how Western European corporates choose between CF and SF, namely to investigate how firm's characteristics, contractual features, and macroeconomic variables affect the choice between AS and CB deals and PF and CB deals. For this analysis, we utilize a logistic regression model.[6] Our dependent variable, choice of debt, is a binary variable equal to 1 if the sponsor/originator closes a PF deal or an AS deal and 0 if it, instead, closes a CB deal. We thus model the choice between PF and CB deals and between AS and CB deals as follows:

$$Choice\ of\ debt_{i,t} = \alpha_0 + \beta \times Corporate\ characteristics_{i,t-1} + \gamma \times Contractual\ characteristics_{i,t} + \varphi \times Macro\ factors_t + \varepsilon_{i,t} \quad (1)$$

where the subscripts refers to deal *i* at time *t*. Next, we identify the explanatory variables used as well as the expected impact on the choice process. Regarding corporate characteristics, we focus on accounting and market corporate characteristics that reflect transaction costs, renegotiation and liquidation risks, and information asymmetries. Table 1 details these variables and the effect observed in our results.

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

Following the arguments presented by Diamond (1984, 1991b) and Boyd and Prescott (1986) we expect that firms with higher information asymmetry may prefer PF to CB. *Firm size* and *market-to-book ratio* are commonly used as proxies for incentive problems related to

[6] The logistic regression is used in cases of dichotomous dependent variable (in our case, PF deal *versus* CB deal or AS deal versus CB deal). 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.

information asymmetries [Krishnaswami *et al.* (1999), Esho *et al.* (2001), Denis and Mihov (2003), and Altunbas *et al.* (2010)]. We thus expect smaller firms and firms with lower market-to-book ratios to choose PF over CB because banks can more efficiently reduce such costs through monitoring. We also use market-to-book ratio to gauge a 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. This forward-looking ratio reflects investor expectations about a firm's cash flow potential. Because such cash flows allow the firm to securitize assets, we expect a positive association between market-to-book and the probability of choosing AS over CB.

To investigate if risky firms with high agency costs of debt are more likely to choose SF over CB, we use *debt to total assets* and *short-term debt to total debt* to proxy for a borrowers' level of financial constraint. Empirically, while some authors document a positive relationship between public debt issuance and proxies for borrower financial distress [Houston and James (1996), Johnson (1997), Krishnaswami *et al.* (1999), Cantillo and Wright (2000), and Denis and Mihov (2003)], Esho *et al.* (2001) and Altunbas *et al.* (2010) find a negative association between financial leverage and public debt issuance. Firms with more *debt to total assets* likely face higher financial risk. Therefore, renegotiation may be more complicated using public debt [Berlin and Loeys (1988) and Chemmanur and Fulghieri (1994)]. Considering that both PF and AS deals are off-balance sheet transactions, we predict that higher levered firms will choose SF over CB 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 for 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.

Because PF is most commonly used for off-balance sheet capital-intensive projects, we expect this ratio to negatively influence the probability of a sponsoring firm choosing a PF over a CB deal. Conversely, we expect the probability of a non-financial firm choosing AS over CB to increase with the proportion of fixed assets; a higher ratio implies more cash flows eligible for securitization. Profitability is measured as *return on assets*. According to Denis and Mihov (2003), profitable firms are more likely to utilize public debt to signal managerial aptitude for generating earnings. We, thus, expect *return on assets* to relate negatively to the probability of SF issuance.

Because financing choice may be sector-specific, we use dummy variables to control for industry factors. Additionally, a dummy variable – *switcher* – identifies firms that employ multiple debt types within our sample period.

Following the flotation costs hypothesis, we might expect that non-financial firms choose PF over CB for relatively small amounts of debt. However, according to Fender and Mitchell (2005), Fabozzi *et al.* (2006), and Gatti *et al.* (2013), structuring an SF transaction is costlier than traditional debt instruments. We thus have to analyze which of the hypotheses – flotation costs *versus* transaction costs – will have more preponderance on the firms' debt choice between PF and CF. Regarding the choice between AS and CB, we expect that firms choose AS for relatively large amounts of debt to economize on scale. Firm size can also test the flotation cost argument. Empirical studies document a positive relationship between public debt financing and firm size [Houston and James (1996), Krishnaswami *et al.* (1999), Esho *et al.* (2001), and Denis and Mihov (2003)]. Therefore, we expect smaller firms to choose PF over CB. Only relatively large firms who would benefit from economies of scale would prefer AS over CB.

We control for other deals' contractual characteristics, namely, weighted average maturity, number of tranches and number of banks per deal. Flannery (1986) and Diamond

(1991a, 1993) point out that when information about the true quality of 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 PF and AS over CB to reduce information asymmetry problems and enabling longer-term borrowing.

We account for macroeconomic conditions using proxies for sovereign default risk, interest rate levels, market volatility, and the term structure of interest rates, along with dummy variables for financial crisis and U.K. borrowers. Finally, we control for creditor rights using La Porta's et al. (1998) and Spamann's (2010) indices.[7]

3.2. Data

The data for this project come from four different sources. We use DCM Analytics and Loan Analytics databases to select the Western European non-financial firms that issued CB, were sponsors in PF deals and originators in AS deals in the 2000-2016 period.[8] DCM Analytics contains information on publicly traded AS bonds, CB and PF bonds while Loan Analytics details PF loans. We use Loan Analytics database to identify sponsors in PF deals because the information provided by DCM Analytics about PF bond issues is scant, since the worldwide PF bond market represent only about 10 to 20% of the total debt market for PF transactions [Gatti (2014)]. We also use these databases to gather information on the deals contractual characteristics.[9] Although DCM Analytics includes several bond types, we retain only those with a deal type code of "corporate bond-investment-grade" and "corporate bond-high yield" for CB, "asset-backed security" (ABS), "mortgage-backed security" (MBS), and

[7] The supply-side of debt markets differ across countries, industries, and time. In our model, we control for country risk, interest rate level, and industry dummies to account for these supply-side conditions.

[8] For this study, we define Western Europe as Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

[9] Information is available on the micro characteristics of the loans and bonds (e.g., deal and loan/bond size, maturity, currency, pricing, rating) and of the issuers/sponsors (e.g., name, nationality, industry sector).

"collateralized-debt obligation" (CDO) for AS, and "project finance" for PF. For CB, deals with perpetual bonds and bonds with additional features such as step-up, caps, or floors were excluded from our sample. We also excluded AS synthetic deals. While Loan Analytics contains historical information about syndicated loans and related banking instruments, we examine only deals with a specific purpose code of "project finance". We also require, for both databases, that the deal status is closed or completed, and that the deal amount be available.

We rely on Thomson Reuters Datastream database to get information on firms' accounting and market data and link debt choice to firm attributes observed in the fiscal year ending just prior to debt issuance. Like DCM Analytics and Loan Analytics databases, this database does not provide an identification code, so we hand-matched those sponsors with a controlling stake in the equity of the separate PF firm with Datastream by using the sponsor name. Additionally, we link Datastream issuer information to DCM Analytics bond information by hand-matching issuer names and issuer-parent names for CB and AS bonds, respectively. This method allows matching the deals with the ultimate party responsible for the financing choice decision between SF and CB deals.[10]

Lastly, macroeconomic data, such as interest rate levels, market volatility, and the Euro swap curve slope is obtained from Bloomberg. We link macroeconomic information with debt characteristics (DCM Analytics and Loan Analytics) on the active date (PF deals) or issue date (AS and CB deals).

3.3. Sample characterization

Based on the data extracted from DCM Analytics and Loan Analytics databases, and after applying the described screens, we are left with a sample of 2,131 PF deals worth €469.76 billion, 313 AS deals worth €230.02 billion, and 6,146 CB deals worth €3,489.03 billion. As

[10] Considering that in SF transactions the borrower is a special purpose company settled up to take on the initiative, we assigned AS and PF deals with sponsors ('Borrower/Issue-Sponsor') in a PF transaction and originators in an AS transaction ('Issuer Parent').

the unit of observation is the deal, multiple tranches from the same transaction appear as separate observations in our database; e.g., PF and AS bonds typically consist of several tranches funding the same SPV. Therefore, to perform a deal-level analysis we use data at the deal-level and, when necessary, we aggregate tranche-level data (e.g., spread and maturity).

Some facts about deal flows provide useful background for an examination of firms' choice between SF and CF. Table 2 presents the distribution by year for the full sample of PF, AS, and CB deals.

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

Table 2 shows that PF lending peaked (by value) in 2008, fell in 2009 and rose again in 2010 and 2011. In 2016, a record $49.40 billion in PF funding was arranged in Western Europe (W.E.), a 269.3% increase from the $13.38 billion reported for 2000. The issuance of AS bonds increased significantly until 2006, having seen an abrupt fall between 2007 and 2009 as a result of the important role played by AS in the development and propagation of the 2007-2008 financial turmoil. Similar patterns can be identified for both AS and CB deals, with a significant increase in the volume issued in W.E. in the 2012-2016 period.

Panel A of Table 3 presents the industrial distribution of the full sample of deals, whereas Panel B details the deal allocation to borrowers in a particular country. Panel A shows that while the largest share of PF deals was awarded to utility and energy (36.98%), industrial (33.79%) and transportation (15.26%), CB deals are concentrated in industrial and commercial services, with these industries accounting for 44.89% and 34.27% of all corporate bond lending, respectively. This finding is consistent with the common understanding that PF is used primarily to fund tangible-asset-rich and capital-intensive projects. AS deals reveals a far less concentrated industrial pattern *via-à-vis* PF and CB lending, with commercial industries receiving the highest share (37.03%) of all AS bond issuance. It is important to notice that state-owned firms use AS deals very often to raise funds.

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

Panel B reveals striking differences between PF lending and AS and CB lending. Panel B shows that AS and CB deals are concentrated in six countries; i.e., borrowers located in France, Germany, Italy, the Netherlands, Spain and the U.K. account for 92.62% and 89.05% of all AS and CB deals by volume, respectively. Whereas the bulk of AS deals are located in the U.K. (36.30%) and Italy (23.08%), CB issuance is highly concentrated in the U.K. (24.07%), France (21.81%), and Germany (21.76%). On the contrary, PF lending reveals a far less concentrated country pattern; i.e., W.E. borrowers use PF very often to fund their investment projects, especially *via* Public-Private Partnerships (PPPs), which played an important role in reducing the need for government borrowing and shifting project risks to the private sector. The biggest recipients of PF lending are the U.K. (25.01%), Spain (21.02%), and France (10.30%). These countries account for 59.33% of the total value of PF deals.

After we merge the firms involved in the deals in our full sample with Datastream, we are able to identify 4,970 firms for which we have all of the necessary data for our analysis. Of these firms, 582 were sponsors in PF deals, 170 originators in AS deals, and 4,218 issuers in CB deals. We refer to this sample as our high-information sample.

Table 4 provides descriptive statistics for our high-information sample of deals. We compare contractual characteristics between deal types using the nonparametric Wilcoxon rank-sum test for continuous variables and Fisher's exact test for discrete variables.

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

The weighted average spread (WAS)--calculated as the weighted average between the tranche spread and its weight in the deal size--corresponds to the deal's economic cost of credit based on available information at the time of closing the loans or issuing the bonds.[11] In an AS transaction, deals tranching is determined by the desired cost of funding. Similarly, in PF deals,

[11] See section 5.1., for a more detailed explanation of how the WAS was calculated.

banks work with sponsors to determine the number and seniority of tranches. Essentially, in SF deals, the cost of funding is determined by the combination of the different tranches. The mean (median) WAS for CB is 204.34 bps (146.68 bps); mean (median) WAS for PF and AS deals are 210.26 bps (157.74 bps) and 67.52 bps (48.45 bps), respectively. The Wilcoxon rank-sum test rejects the null hypothesis that the WAS is identically distributed for AS and CB deals; i.e., corporates face higher average WASs when issuing CB bonds than AS bonds. In contrast, WAS for PF and CB deals is not significantly different at the 1 percent level. These results are in line with the prediction of SF literature [Finnerty (1988), Oldfield (1997), Caselli and Gatti (2005), DeMarzo (2005), and Fabozzi *et al.* (2006)], which posits that SF reduces funding costs *vis-à-vis* straight debt financing by mitigating agency problems and information asymmetries, for AS deals only.

As we expected, mean (median) AS deal size of €769.01 million (€599.01 million) significantly exceeds that of CB deal size. On the contrary, the mean (median) PF deal size of €257.33 million (€137.76 million) is significantly less than the CB mean (median) deal size of €658.64 million (€443.11 million). This result can be explained by the fact that PF is typically loan based or buy-and-hold project bond based. Thus, larger PF deals, even if financed by large banking syndicates, may not allow the same amount of funding to be raised as in public bond issuances, since they constitute a larger share in lenders portfolio. Regarding country risk, we find that while PF borrowers are, on average, located in far riskier countries (2.79) than CB issuers (2.28), AS originators are located in countries with lower sovereign risk (1.52).

The weighted average maturity (WAM) of SF deals--14.59 years and 15.52 years for PF and AS, respectively--is significantly higher than that of 8.28 years for CB deals. In contrast to traditional secured bonds in which repayment capacity stems from the issuer's ability to generate sufficient cash flows (creditors are paid with firm's cash flows; assets as collateral come into force in case of default), AS bond repayment prospects depend primarily on a pool

of future receivables pledged as collateral for the issue. Similarly, PF loan and bond maturities typically reflect maturities of the projects implemented by the SPV, which tend to be longer term. Therefore, AS and PF WAMs tend to be longer *vis-à-vis* traditional CB WAMs.

AS and PF deals typically include a much larger number of tranches than CB deals; an average CB deal includes 1.32 tranches while average PF and AS deals have 2.01 and 2.86 tranches, respectively. Thus, we conclude that SF transactions benefit more from separating the deal into several tranches with different risks, rewards and maturities. For CB deals, the average number of participating banks is 4.92, which is significantly larger than the AS deal average (2.90) but smaller than the PF deal average (5.05). This is consistent with the view that banks attempt to maximize the number of PF participants to spread out risk, since larger tranches might imply higher risk for lender since they constitute a larger share in its loan/bond portfolio.

The fraction of AS bonds issued by U.K. corporates, 42.94%, is significantly higher than that for CB deals, 20.00%. Contrary to AS, during the crisis period W.E. corporates made much more frequent use of PF and CB deals than in the pre-crisis period. Finally, while the largest share of AS and CB deals was awarded to commercial and industrial sector--76.47% for AS deals and 79.21% for CB deals--, the bulk of PF lending is extended to capital-intensive sectors like utilities, energy and mining.

Table 5 reports characteristics of non-financial firms that were sponsors in a PF deal, originators in an AS deal, or issuers in a CB issue. We subdivide these firms into six categories according to their borrowing record within our sample period. The PF and CB deals' subsample is categorized as closing: (I) only PF deals; (II) only CB deals; and (III) both PF and CB deals. Similarly, the AS and CB deals' subsample is categorized as closing: (IV) only AS deals; (V) only CB deals; and (VI) both AS and CB deals.

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

On average, borrowers that used only PF deals are smaller and have lower short-term debt levels, and lower profitability than those accessing CB markets, exclusively. These results are not surprising. PF is of great demand when it does not substantially impact the balance sheet and allows maintaining the key financial ratios. Financial leverage, fixed assets to total assets, and market-to-book ratios do not differ at the 1% significance levels for the two subsets of firms.

As expected, firms utilizing both markets are much larger than those reliant on either, exclusively. With average size of €64.00 billion, firms in category [III] have borrowing needs and capacity to use both CB and PF markets extensively. They have relatively lower short-term debt to total debt and market-to-book ratios than firms using only PF or CB deals do. Firms that used simultaneously PF and CB are less levered, have a higher asset tangibility and lower profitability when compared with firms that issued CB only. Financial leverage, asset tangibility and return on assets are similar for firms in categories [I] and [III].

Borrowers that use only AS deals are more levered and have lower profitability than those using only CB. However, size and short-term debt to total debt, fixed assets to total assets and market-to-book ratios do not differ at the 1% significance levels for the firms in categories [IV] and [V]. Again, firms accessing both AS and CB markets are much larger than those employing only one deal type. Category [VI] firms have higher short-term debt levels than firms using only AS or CB. Firms that access both markets are more levered and have lower market to book and return on asset ratios than CB-only issuers. Finally, asset tangibility is similar for firms in categories [IV], [V] and [VI].

4. Determinants of a firms' debt choice

Building on debt choice, structured finance, and security design literature, we investigate how non-financial firm's characteristics influence the choice between SF and CF

(PF *versus* CB and AS *versus* CB), while controlling for contractual characteristics and macroeconomic factors. As previously mentioned, we use a unique dataset, compiled from four different data providers (DCM Analytics, Loan Analytics, Datastream and Bloomberg).

4.1. Base model results

Table 6 reports the results achieved by applying the logistic regression (1) predicting firms' choices of debt between PF and CB deals and between AS and CB deals. In model [1], we link 972 firms' choice of debt for 4,800 PF and CB deals, while in model [2] we link 827 firms' choice of debt for 4,388 AS and CB deals.

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

We find that smaller firms are more likely to raise funds through PF than CF. In line with previous empirical studies, we find deal size to negatively affect the probability of closing PF deals instead of public CB deals. Taking these results together, we corroborate the flotation costs hypothesis for PF. We, thus, find that the flotation costs argument is more preponderant than the transaction costs argument on the firms' debt choice between PF and CF. Concerning the choice between AS and CB deals, we do not find evidence that firms choose AS when issuing larger amounts of debt to benefit from economies of scale.

Regarding the asymmetric information hypothesis, we find that firms with potential asymmetric information problems, relatively smaller ones and with lower market-to-book ratios prefer PF deals. Concerning the choice between AS and CB, we find an insignificant relationship between the market-to-book ratio and the probability of observing an AS deal; i.e., the investor expectations about a firm's cash flow potential does not affect the probability of observing an AS deal *vis-à-vis* a CB deal. In addition, when we use firm size as a proxy for information asymmetry, our results show that smaller firms choose AS over CB deals. Finally, our results support security design literature [Flannery (1986) and Diamond (1991a, 1993)], which predicts that SF reduces asymmetric information problems and enables borrowers to

obtain funding with longer maturities. Overall, our findings indicate that asymmetric information problems can be reduced using transactions specifically structured through an SPV and secured by ring-fenced assets that produce cash flows solely to support the transaction.

Results document that financial leverage does not impact the choice between PF and CB deals. Contrary to what expected, we report a negative relationship between short-term debt level and likelihood to access PF markets. This might be explained by the fact that PF transactions are complex in terms of designing the transaction and writing the required documentation and involve significant due diligence, negotiation, and legal procedures. Hence, structuring a PF deal takes more time and entails greater transaction costs than CF. Therefore, it makes sense that firms with a higher level of debt maturing in the short-term tend to resort to CB deals to cover their financing needs as they take relatively less time to implement. We also find that more levered firms tend to choose AS over CB. This finding is unsurprising because AS allows sponsors to maintain financial flexibility and protect their credit capacity through off-balance sheet financing. In this context, we interpret high financial leverage as a financial distress factor [Esho *et al.* (2001)] and not as a reputational factor [Houston and James (1996), Johnson (1997), Krishnaswami *et al.* (1999), Cantillo and Wright (2000), and Denis and Mihov (2003)]. Thus, in accord with the renegotiation and liquidation hypothesis, we find that AS transactions more effectively mitigate agency conflicts between borrowers and lenders.

As expected, higher asset tangibility is negatively associated with firm preference of PF over CB. This supports the prediction from earlier information asymmetry literature: private borrowers have significantly lower asset tangibility than public issuers [Denis and Mihov (2003)]. However, in contrast to what expected, the fixed assets to total assets ratio affects negatively the probability of observing AS over CB. We find that profitability reduces the likelihood of accessing both PF and AS markets, which corroborates SF literature [Caselli and Gatti (2005) and Fabozzi *et al.* (2006)] that states that firms choose SF over CF to improve

sponsors' key financial ratios. Our results for PF deals mirror those of Denis and Mihov (2003), who report that profitable firms are more likely to issue public rather than private debt. However, our findings contradict those of Altunbas *et al.* (2010), who show that profitability increases firms' likelihood of choosing syndicated loans over public debt.

Results show clearly that PF transactions are typically used for funding capital-intensive facilities and utilities, while AS deals are less frequently used to raise funds in the utility and energy, and industrial sectors. We also find that firms, which employ both SF and CF within our sample period, are more likely to choose SF deals when issuing new debt. Sponsors that have already participated in SF face lower transaction costs. This is no surprise as SF transactions are expensive to orchestrate and take longer to execute.

As expected, the number of tranches positively influence the probability of observing an AS deal or a PF deal versus a CB deal. The creation of multiple types of securities backed by the firm's (or by the underlying asset pool, when considering securitization) assets is considered one of the most important features that distinguishes SF instruments from traditional debt products. In AS, deals' originators exploit market factors to their advantage via tranching of AS bonds. In PF, a collection of banks – bank syndicate – jointly extends several loans to a specific borrower (SPV) in order to spread risks. This argument also explains why we find a positive relationship between the number of banks and the probability of observing a PF deal. Unexpectedly, the number of banks impacts negatively the choice between AS and CB deals.

Regarding macroeconomic variables, the country risk, the level of interest rates and the yield curve slope do not affect the choice between SF and CF deals. A new deal closed by a borrower located in the U.K. is less likely to be structured as PF than CF. This can be explained by the important role played by PF, especially Public-Private Partnerships, in reducing the need for government borrowing and shifting project risks to the private sector in Southern European

countries. Sponsors located in countries with better creditor rights positively affect the probability of observing a PF deal rather than a CB deal. This can be explained by the fact that in PF transactions, which are characterized by leveraged capital structures, syndicated banks advance more quickly with these structures when have a higher creditor rights level. In addition, in periods of higher volatility in capital markets, firms tend toward PF. Finally, due to AS bonds' prominent role in the development and propagation of the 2007-2008 financial crisis, the crisis dummy variable reflects a lower probability of observing this debt type during the crisis. Note, though, that the remaining macroeconomic variables do not affect the likelihood of observing an AS *versus* a CB deal.

By comparing SF and CF debt choices, we find strong evidence that SF facilitates the reduction of the deadweight costs from asymmetric information problems, which corroborates H1. Results only corroborate the flotation costs hypothesis for PF [H2] and we only find evidence that risky firms with high agency costs of debt are more likely to choose SF over CF for AS [H3]. SF deals allow sponsors/originators to maintain financial flexibility by creating non-recourse vehicle entities to carry the debt. In turn, this helps sponsors protect their credit standing and future access to financial markets. Our results show that firms utilizing PF are smaller and less profitable and have lower short-term debt to total debt, lower asset tangibility, and less growth opportunities than CB issuers have. Firms that prefer AS over CB, tend to be smaller, more levered, and less profitable and have lower proportions of fixed assets.

4.2. The impact of the 2007-2008 financial crisis on the firms' debt choice

Table 7 includes re-estimation of models [1] and [2] for two sub-periods to examine whether debt financing choices change over time. Specifically, all transactions before the Lehman Brothers bankruptcy on September 14, 2008 constitute the pre-crisis period while transactions thereafter occur in the crisis period. This section analyzes firm choice between SF

and CF for 133 AS, 1,602 CB and 202 PF deals closed in the pre-crisis period, and for 37 AS, 2,696 CB and 383 PF deals closed in the crisis period.

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

Results from models [1a] and [1b] show interesting changes in firm attributes and macroeconomic factors between the two sub-periods. Regarding firms' characteristics, both *debt to total assets* and *short-term debt to total debt* ratios lose significance over the crisis period. In addition, *utility and energy* dummy variable begins to positive influence the probability of observing a PF transaction during the crisis. While market volatility only determines a firm's participation in both PF and CB markets during the crisis, the Euro swap curve slope no longer affects the likelihood of PF issuance. Importantly, regardless of the period considered, our results continue to corroborate H1 and H2; i.e., smaller firms use PF over CB when seek long-term financing and want to raise relatively smaller amounts of debt. Our results also show that in both periods, firms utilizing PF are less profitable and have lower asset tangibility than CB issuers.

Regarding the choice between AS and CB deals (models [2a] and [2b]), we note that explanatory factors in borrower choice shift from default and creditor protection factors (leverage, country risk and creditor rights) to marketability factors (firm size, asset tangibility and deal size). However, it is important to notice that the results for the crisis period have to be analyzed carefully, since we only have information for 37 AS deals. We believe that this analysis with a higher number of observations presents an important opportunity for future research. In relation to the pre-crisis period, the results validate the renegotiation and liquidation hypothesis: leverage and short-term debt to total debt ratios impact positively the choice between AS and CB deals. Finally, the significant positive relationship between country risk and the likelihood of observing an AS transaction during the pre-crisis period is not surprising, as AS transactions allow the issuance of bonds with higher credit ratings than that

of the originators. Considering that, there is a direct relationship between the countries' credit risk and that of the originators, companies located in countries with worse ratings benefit more from this type of SF deals.

4.3. The role of credit risk and funding costs on the firms' debt choice

In this section, we subject the various high-information samples to logistic regression analyses, with two objectives. First, we examine whether the credit risk of firms affect the choice between SF and CF. According to Hill (1996), Riddiough (1997) and Fabozzi *et al.* (2006), firms with high-quality assets and with low credit ratings may be able to raise debt through SF transactions without deteriorating their creditworthiness and with better funding conditions. This is clearer for AS deals because in AS, bond tranches can have higher credit ratings or be otherwise less risky than the originator's general obligations. We use the *Z-score* as a proxy for a firms' credit risk and expect a negative relationship to the choice of PF and AS *vis-à-vis* CB deals. Second, we investigate if the cost of funding affects the firms' debt choice. The SF literature points out that one of the principal reasons a non-bank corporation may elect to raise debt financing under a structured model is to reduce funding costs [Esty (2003), Roever and Fabozzi (2003), Caselli and Gatti (2005), and Fabozzi *et al.* (2006)]. If borrowers use SF transactions to facilitate lower funding costs relative to traditional funding sources, we should expect the WAS to negatively influence the probability of a firm choosing a PF or an AS deal over a CB deal.[12]

The results of these tests are reported in models [3] to [6] of Table 8. Regardless the proxy for credit risk we use, our results show, as expected, that firms that are less creditworthy on average prefer SF to CF transactions. In PF, the off-balance sheet treatment of the funding

[12] We use the Altman's (1993) Z-score as an overall measure of the default risk, which depends on the value of various financial ratios of the firm (issuer for CB deals, originator for AS deals, and sponsor for PF deals). The higher the Z-score, the lower is the risk of the firm's bankruptcy. We do not include Z-score and WAS variables in the initial model due to the significant reduction in the number of observations that this would impose: 1,181 and 1,061 observations for Z-score in models [1] and [2], respectively; 1,607 and 1,261 observations for WAS.

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. Hence, firms with lower Z-scores prefer PF over CB as it prevents contamination risk: the separation of projects in an SPV avoids that the new project contaminates the firm or other projects with a positive NPV and thus further reduce their creditworthiness. By removing assets from balance sheet, AS can improve the originators' key financial ratios, namely leverage and return on assets. Additionally, for firms with worse credit ratings, AS allows the issuance of bonds with a higher credit rating than the originator's general obligations. This happens because the credit quality of the issued securities is based on the underlying pool of assets, not the issuer's credit rating.

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

Concerning the impact of WAS on the choice between SF and CF deals, results presented in models [4] and [6] show that while there is an insignificant relationship between our cost of funding proxy and the probability of observing an PF deal, the WAS affects negatively the probability of observing an AS deal *vis-à-vis* a CB deal. Thus, our results only support SF literature for AS: firms use AS deals to reduce the cost of borrowing. We investigate further this effect in section 5, where we examine if SF transactions are more or less expensive than CF transactions, after controlling for other micro and macro pricing characteristics.

4.4. Robustness checks

In this section, we report the results of some robustness checks we have undertaken on our main findings. Our first test investigates whether additional firms' characteristics drives our key findings. We thus examine if the firms' ability to pay short-term obligations affects debt choices and find a positive relationship between the current ratio and the likelihood of borrowing through PF and AS markets instead of CB markets. Second, we replace the LLSV's (1998) index with the Spamann's (2010) index and add the type of law regime – civil law

versus common law – as investor protection measures. We also re-estimated models [1] and [2], after adding a measure for local factors – GDP per capita logarithm – and we find that our results do not change qualitatively. Finally, we investigate the role of a firm's reputation on the choice between SF and SDF. In line with Hale and Santos (2008), we rely on the history of firms' credit risk to define their reputation by allowing for a non-linear impact of the Z-score in the probability of observing a PF or an AS deal *versus* a CB deal. Re-estimating models [3] and [5] after including the quartiles of the distribution of these scores yield exactly the same results: the coefficients on all the quartiles of Z-score are significant and negative and our estimates for the remaining variables are not affected by it.

5. Cost of funding and firms' debt choice

5.1. Methodology

Extant literature on SF and security design [Diamond (1993), Allen and Winton (1995), Hart and Moore (1995), Winton (1995), Caselli and Gatti (2005), and Sannikov (2013)] leads us to hypothesize that SF transactions reduce funding costs by mitigating market imperfection costs and improving risk management. If SF transactions facilitate lower funding costs relative to traditional funding sources, the WAS for CB deals should exceed that of PF and AS deals. Although a thorough analysis of the determinants of debt pricing is beyond the scope of this paper, we test this hypothesis by using the model described in equation (2). The dependent variable is the WAS and we create two dummy variables set equal to 1 if the transaction is a PF deal (*PF*) or an AS deal (*AS*), and 0 otherwise.

$$WAS_{i,t} = \alpha_0 + \beta \times Corporate\ characteristics_{i,t} + \gamma \times Contractual\ characteristics_{i,t} + \varphi \times Macro\ factors_t + \varepsilon_{i,t} \quad (2)$$

where the subscripts refers to deal *i* at time *t*. The list of controls includes those used in the logistic models presented in section 4. We employ OLS regression techniques and adjust for heteroskedasticity. Due to time varying risk premia, we estimate standard errors clustered

by year. Our previous results (see 4.3.) show that while there is an insignificant relationship between the WAS and the likelihood of observing PF *vis-à-vis* CB, the overall cost of debt affects negatively the choice between AS and CB deals. We thus should expect a significant negative impact of the *AS* dummy on WAS and an insignificant relationship between the *PF* dummy and WAS.

Before presenting the results from estimating equation (2), it is important to explain how our dependent variable, WAS, used as a proxy for the overall cost of credit, is computed. The spread corresponds to the price for the risk associated with the financing instrument at closing. For PF loans, the credit spread represents the spread paid by the borrower over 3-month Euribor or 3-month Libor plus the facility fee (all-in-spread-drawn). For PF and AS bonds as well as for CB issues, the spread is defined as the margin yielded by the security at issue above a corresponding currency treasury benchmark with a comparable maturity (option adjusted spread).[13] The comparability of our pricing variables across loans and bonds can be improved by making the following adjustment: while in PF loans, the benchmark priced off Euribor or Libor is a three-month interbank rate, bonds typically carry a spread over a benchmark government security, such as German Treasury bonds. Therefore, there is a difference between the two benchmarks represented by different credit risk levels involving unsecured short-term bank risk and a risk-free government rate. Following the approach of Thomas and Wang (2004) and Sorge and Gadanecz (2008), we adjust for the risk difference of the bond and loan benchmarks by adding to the Euribor or Libor spread of the PF loans the difference between the three-month Euro Libor and the three-month German Treasury bill at the time when the loans were granted. Despite the adjustment, we are aware that the

[13] Previous empirical studies commonly use the all-in-spread-drawn (AISD) as a proxy for the cost of capital in syndicated loans [Kleimeier and Megginson (2000), Sorge and Gadanecz (2008), and Gatti *et al.* (2013)]. Similarly, the margin between a bond's contractual yield and that of a comparable maturity treasury benchmark commonly proxies for a bond's economic cost of credit [Gabbi and Sironi (2005), Vink and Thibeault (2008), and Sorge and Gadanecz (2008)].

comparability between loans and bonds has some drawbacks, including that bonds and loans may have different levels of liquidity and different covenants, and that fees are an important part of debt contracting.

5.2. Results

Column 1 of Table 9 reports estimates of equation (2) for a sample of 256 PF, 121 AS, and 2,914 CB deals. The results suggest that AS transactions in Western Europe are associated with lower WAS, holding other factors constant, since the AS dummy variable is associated with a statistically significant 91.12 bps drop in WAS. On the other hand, PF deals' cost of funding does not differ significantly from that of CB deals. In order to check whether these findings are robust over time, we re-estimate model [7] for the pre-crisis period from January 1, 2000 through to September 14, 2008 and the crisis period from September 15, 2008 (the first trading day after Lehman Brothers' bankruptcy filing the day before) through December 31, 2016. Our results indicate that during both the pre-crisis (model [7a]) and crisis (model [7b]) periods, while AS deals have lower WAS than CB deals, PF deals WAS does not differ significantly from that of CB deals. Therefore, we only corroborate the hypothesis raised by the SF literature that the funding cost on SF is lower than the funding cost on CF for AS transactions.[14] AS allows originators to reduce borrowing costs when bonds created through securitization have, on average, a higher credit rating or are otherwise perceived to have less risk than that of originators. AS transforms pools of assets into securitized tranches characterized by different risk-return properties. In AS transactions, issuers work with rating agencies to articulate the tranching and to define the necessary credit enhancement mechanisms to improve the security's credit rating and reduce the risks transferred to investors.

[14] To eliminate the comparability problem between loans and bonds identified in section 5.1, we re-estimate model [7] in Table 9 by eliminating PF loans from the sample. Results show that both AS and PF bond deals have lower WAS than CB deals. However, we do not present the results because the sample contains only 22 PF bond deals. We consider that a further analysis using a larger database of PF deals is an important avenue for future research.

6. Summary and conclusions

This paper provides empirical evidence on corporate borrowing decisions, namely on the factors that influence the choice between corporate financing (CF) and structured finance (SF) transactions. Our results document that sampled firms' characteristics, like size, profitability, leverage, asset tangibility, growth opportunities, and credit risk influence the firms' choice between SF and CF deals. Findings are consistent with the hypothesis that SF promotes the reduction of the deadweight costs associated with information asymmetries and provide support for the flotation costs hypothesis of debt choice between project finance and corporate bonds. We also find evidence consistent with the notion that SF transactions, especially in the form of asset securitization, are more effective in mitigating agency conflicts between borrowers and lenders, than corporate bonds. Additionally, results confirm the prediction that borrowers with less favorable prospects and, unable or unwilling, to take in the risk liquidity inherent to interim renegotiation, will self-select into contracting longer-term financing, therefore choosing SF over CF for long-term financing.

We provide evidence on reduced borrowing costs for asset securitization deals, *vis-à-vis* corporate bonds, but not for project finance. We interpret this result as evidence that rational borrowers choose between SF and CF based on the cost of capital efficiency of the available financing alternatives.[15] Therefore, we argue, that further research exploring if SF transactions reduce sponsors' or originators' overall cost of capital, as well as on firms' relative use of these funding sources, would be particularly useful and valuable.

[15] For example, the decision to go with a project finance transaction, or with a corporate bond issuance, should be based on the trade-off between the composite cost of capital of the project finance, and the sponsor's, and the sponsor's overall cost of capital after the CF.

Acknowledgements

The authors thank Christine Brown, Robert DeYoung, Gary Emery, Benjamin Esty, Miguel Ferreira, Ufuk Güçbilmez, Craig Lewis, Manuel Marques, William Megginson, Leonid Pugachev, Gordon Roberts, João Santos, Anthony Saunders, Pedro Silva, John Thornton, and Huan Yang for useful comments and valuable suggestions. We also thank participants in the FMA 2011 Doctoral Student Consortium in Porto, the 2014 Portuguese Finance Network International Conference in Vilamoura, the Midwest Finance Association 2015 Annual Meeting in Chicago, USA, the 2015 INFINITI Conference in Ljubljana, the 6th Accounting and Finance Conference of the Catholic University of Portugal-Porto, and the FMA 2015 Annual Conference in Orlando, USA. The authors are responsible for all remaining errors and omissions. We are especially grateful to the Católica Porto Business School - Catholic University of Portugal for providing access to DCM Analytics and Loan Analytics databases.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Table 1: Definition of variables and findings

Variables	Description	Findings | Choice of debt	
		PF versus CB deals	AS versus CB deals
Corporate characteristics			
Log total assets	Logarithm of firm total assets measured in € million.	-	-
Debt to total assets	The ratio of total debt to total assets.	I / +	I / +
Short-term debt to total debt	The ratio of short-term debt to total debt. Short-term debt measures debt maturing within 1 year.	-	I / +
Fixed assets to total assets	The ratio of fixed assets to total assets.	-	-
Market to book ratio	The sum of book value of liabilities and market value of equity divided by the book value of assets.	I / -	I / +
Return on assets	The net income before preferred dividends minus preferred dividend requirement, divided by total assets.	-	-
Switcher	Dummy equal to 1 if firms used both debt instrument types within our sample period and 0, otherwise.	+	+
Log Z-score	Logarithm of Altman's (1993) Z-score. The higher the Z-score, the lower is the risk of the firm's bankruptcy.	-	-
Contractual characteristics			
Weighted average spread	The weighted average between the tranche spread and its weight in the deal size. Corresponds to the deal's economic cost of credit.	I	-
Log deal size	Logarithm of the deal size measured in € million.	-	I / +
Weighted average maturity	The weighted average between the tranche maturity, in years, and its weight in the deal size.	+	+
Number of tranches	Number of tranches per deal.	+	+
Number of banks	Number of financial institutions participating in the debt issuance.	+	-
Macroeconomic factors			
Country risk	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.	I	I / +
UK borrowers	Dummy equal to 1 if the sponsor/originator/issuer is located in the U.K. and 0, otherwise.	-	I
Creditor rights	Measured using La Porta, Lopez-de-Silanes, Shleifer and Vishny's (1998) and Spamann's (2010) indices.	+	I / +
Crisis	Dummy equal to 1 if the deals' issuance/closing date falls within the crisis period (September 15, 2008 – December 31, 2016) and 0, otherwise.	I	-
Risk free rate	The three-month German Treasury bill at the time of issuance/closing the deals - a proxy for the general level of interest rates.	I	I
Volatility	The Chicago Board Options Exchange Volatility Index (VIX). VIX reflects a market estimate of future volatility.	I / +	I / +
EUSA5y-Libor3M	The Euro swap curve slope. Obtained as the between the five-year Euro swap rate and the 3-month LIBOR rate.	I / -	I

Notes: A "–" indicates negative impact on the probability of a firm to choose PF deals over CB deals or AS deals over CB deals. A "+" indicates positive impact on the probability of a firm to choose PF deals over CB deals or AS deals over CB deals. An "I" indicates insignificant impact.

Table 2: Distribution of the full sample of deals by year

Year	Project Finance deals			Asset Securitization deals			Corporate Bond deals		
	Number of deals	Total value [€ Million]	Percent of total value	Number of deals	Total value [€ Million]	Percent of total value	Number of deals	Total value [€ Million]	Percent of total value
2000	47	13,376.94	2.85%	26	16,109.37	7.00%	244	156,880.63	4.50%
2001	49	12,356.12	2.63%	37	27,118.71	11.79%	271	185,162.40	5.31%
2002	32	10,744.80	2.29%	22	21,089.67	9.17%	206	113,013.46	3.24%
2003	60	20,574.16	4.38%	41	28,115.35	12.22%	259	152,664.33	4.38%
2004	65	12,236.84	2.60%	24	18,182.06	7.90%	206	95,210.05	2.73%
2005	52	14,126.27	3.01%	37	31,296.27	13.61%	200	93,729.16	2.69%
2006	47	15,432.14	3.29%	43	34,692.69	15.08%	237	154,866.44	4.44%
2007	92	22,319.50	4.75%	25	19,872.66	8.64%	180	121,232.21	3.47%
2008	241	46,620.75	9.92%	7	5,534.19	2.41%	242	141,856.42	4.07%
2009	181	33,820.49	7.20%	4	1,691.34	0.74%	396	318,228.20	9.12%
2010	210	45,338.73	9.65%	3	1,650.00	0.72%	351	179,405.89	5.14%
2011	172	40,558.70	8.63%	3	1,684.42	0.73%	375	178,381.14	5.11%
2012	136	27,840.36	5.93%	8	4,931.22	2.14%	620	325,778.11	9.34%
2013	153	35,138.28	7.48%	7	4,727.42	2.06%	640	285,169.53	8.17%
2014	143	30,976.22	6.59%	12	6,534.58	2.84%	670	308,250.74	8.83%
2015	220	38,907.76	8.28%	10	4,208.98	1.83%	536	298,508.53	8.56%
2016	231	49,395.20	10.51%	4	2,584.61	1.12%	513	380,695.74	10.91%
Total	**2,131**	**469,763.24**	**100.00%**	**313**	**230,023.54**	**100.00%**	**6,146**	**3,489,032.97**	**100.00%**

Table 2 describes the distribution of the full sample of deals by year. Data are for deals reported in DCM Analytics and Loan Analytics with deal amount available, closed by Western European non-financial firms during the 2000–2016 period. For CB, deals with perpetual bonds and bonds with additional features such as step-up, caps, or floors were excluded from our sample. We also excluded AS synthetic deals.

Table 3: Industrial and geographic distribution of the full sample of deals

Panel A: Percentage of deal volume by industry			
Borrower industry	**Project Finance deals**	**Asset Securitization deals**	**Corporate Bond deals**
Commercial	12.02	37.03	34.27
Industrial	33.79	26.06	44.89
Utility and energy	36.98	5.99	15.34
Transportation	15.26	12.65	5.14
Public administration/Government	1.96	18.27	0.36
Total	**100.00**	**100.00**	**100.00**
Panel B: Percentage of deal volume by country			
Borrower domicile	**Project Finance deals**	**Asset Securitization deals**	**Corporate Bond deals**
Austria	0.50	1.51	0.98
Belgium	2.38	0.52	3.93
Cyprus	0.05	-	0.01
Denmark	0.37	-	0.01
Finland	1.28	0.16	1.19
France	10.30	11.59	21.81
Germany	6.70	14.59	21.76
Greece	2.71	1.73	0.76
Iceland	0.13	-	0.01
Ireland	1.55	1.48	1.35
Italy	8.57	23.08	8.56
Luxembourg	0.36	0.13	1.22
Netherlands	5.33	6.33	6.69
Norway	1.34	-	-
Portugal	5.16	1.85	1.29
Spain	24.02	0.74	6.16
Sweden	3.28	-	0.06
Switzerland	0.96	-	0.14
United Kingdom	25.01	36.30	24.07
Total	**100.00**	**100.00**	**100.00**

Panel A describes the industrial distribution of the full sample of deals, whereas Panel B detail the deal allocation to borrowers in a particular country. Data are for deals reported in DCM Analytics and Loan Analytics with deal amount available, closed by Western European non-financial firms during the 2000–2016 period. For CB, deals with perpetual bonds and bonds with additional features such as step-up, caps, or floors were excluded from our sample. We also excluded AS synthetic deals.

Table 4: Descriptive statistics for deals' contractual characteristics

Variable of interest	PF deals	AS deals	CB deals
	N = 582	*N = 170*	*N = 4,218*
Continuous variables:			
Weighted average spread (bps)[1]	210.26 (157.74)	67.52 [b] (48.45)	204.34 [b] (146.68)
Deal size (€ million)	257.33 [a] (137.76)	769.01 [b] (599.01)	658.64 [a,b] (443.11)
Country rating [1-22 weak][2]	2.79 [a] (1)	1.52 [b] (1)	2.28 [a,b] (1)
Weighted average maturity [years][3]	14.59 [a] (14.82)	15.52 [b] (12.01)	8.28 [a,b] (7.00)
Number of tranches	2.01 [a] (1)	2.86 [b] (2)	1.32 [a,b] (1)
Number of banks	5.05 [a] (3)	2.90 [b] (2)	4.92 [a,b] (4)
Discrete variables:			
Deals to U.K. borrowers	22.68% (132)	42.94% [b] (73)	20.00% [b] (844)
Deals to commercial sector	12.19% [a] (71)	42.94% [b] (73)	31.37% [a,b] (1,323)
Deals to industrial sector	35.74% [a] (208)	33.53% [b] (57)	47.84% [a,b] (2,018)
Deals to utility and energy sector	43.64% [a] (254)	10.00% (17)	14.15% [a] (597)
Deals to transportation sector	7.00% (41)	13.53% [b] (23)	6.05% [b] (255)
Deals closed in the crisis period[4]	65.46% (381)	21.77% [b] (37)	62.85% [b] (2,651)

Table 4 presents contractual characteristics for the high-information sample of deals to firms in W.E. countries. Each cell contains means and parenthetic medians for continuous variables' and percents and parenthetic levels for discrete variables'. We test for similar distributions in contractual characteristics using the Wilcoxon rank-sum test for continuous variables and the Fisher's exact test for discrete ones. [1] Weighted average spread (WAS) is the weighted average between the tranche spread and its weight in the deal size. For PF loans, the WAS is the sum of the all-in-spread-drawn and the difference between 3-month LIBOR and 3-month German Treasury yield at the time of the closing. For bonds, the WAS is the margin yielded by the security at issue above a corresponding currency treasury benchmark with a comparable maturity. [2] Country rating 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. [3] Weighted average maturity is the weighted average between the tranche maturity and its weight in the deal size. [4] Crisis period: from September 15, 2008 (the first trading day after Lehman Brothers' bankruptcy filing the day before) through December 31, 2016. [a] indicates significant difference at the 1% level between PF and CB deals. [b] indicates significant difference at the 1% level between AS and CB deals.

Table 5: Descriptive statistics for firms' characteristics

Variable of interest	[I] PF deals only (*N = 354*)	[II] CB deals only (*N = 3,733*)	[III] PF and CB deals (*N = 713*)	[IV] AS deals only (*N = 51*)	[V] CB deals only (*N = 3,521*)	[VI] AS bonds and SD bonds (*N = 816*)
Total assets (€ million)	16,021.30 [a,b]	48,088.77 [a,c]	64,001.01 [b,c]	144,259.20 [e]	36,947.39 [f]	104,872.50 [e,f]
	(3,439.69)	(20,296.00)	(30,226.00)	(7,550.11)	(16,393.00)	(88,277.00)
Debt to total assets	34.89%	35.15% [c]	32.83% [c]	42.50% [d]	33.68% [d,f]	40.12% [f]
	(33.80%)	(35.11%)	(32.09%)	(42.99%)	(33.00%)	(42.77%)
Short-term debt to total debt	23.60% [a,b]	27.96% [a,c]	22.73% [b,c]	28.35% [e]	25.77% [f]	34.48% [e,f]
	(16.37%)	(23.72%)	(19.20%)	(14.00%)	(21.45%)	(40.84%)
Fixed assets to total assets	36.14%	36.45% [c]	38.52% [c]	41.13%	37.13%	37.33%
	(31.67%)	(31.63%)	(42.61%)	(31.15%)	(34.71%)	(30.31%)
Market to book ratio	88.74% [b]	98.83% [c]	72.17% [b,c]	85.84%	100.16% [f]	81.13% [f]
	(76.17%)	(79.54%)	(69.71%)	(83.06%)	(79.78%)	(75.13%)
Return on assets	-16.44% [a]	5.43% [a,c]	3.89% [c]	3.48% [d]	5.59% [d,f]	3.72% [f]
	(3.96%)	(4.85%)	(3.76%)	(4.08%)	(5.15%)	(3.75%)

Table 5 presents non-financial firms' characteristics for the high-information sample of deals to firms in W.E. countries. Each cell contains means and parenthetic medians. We test for similar distributions in non-financial firms' characteristics across samples via the Wilcoxon rank-sum test. [a] denotes statistical difference at the 1% level between 'PF deals only' and 'CB deals only' samples. [b] denotes statistical difference at the 1% level between 'PF deals only' and 'PF and CB deals' samples. [c] denotes statistical difference at the 1% level between 'CB deals only' and 'PF and CB deals' samples. [d] denotes statistical difference at the 1% level between 'AS deals only' and 'CB deals only' samples. [e] denotes statistical difference at the 1% level between 'AS deals only' and 'AS and SD deals' samples. [f] denotes statistical difference at the 1% level between 'CB deals only' and 'AS and CB deals' 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 6: Determinants of firms' choice

Dependent variable:	PF deal = 1, CB deal = 0	AS deal = 1, CB deal = 0
Choice of debt	[1]	[2]
Independent variables:		
Intercept	0.553 (0.496)	-3.913 *** (0.002)
Log total assets	-0.671 *** (0.000)	-0.515 *** (0.002)
Debt to total assets	0.003 (0.134)	0.004 ** (0.025)
Short-term debt to total debt	-0.011 ** (0.022)	0.009 (0.351)
Fixed assets to total assets	-0.014 *** (0.000)	-0.014 ** (0.050)
Market to book ratio	-0.002 * (0.076)	0.001 (0.565)
Return on assets	-0.039 *** (0.005)	-0.037 *** (0.000)
Commercial	-1.278 *** (0.000)	-0.291 (0.492)
Industrial	-0.417 (0.105)	-0.818 * (0.094)
Utility and energy	0.582 * (0.061)	-1.064 ** (0.012)
Switcher	1.441 *** (0.000)	3.563 *** (0.000)
Log deal size	-2.479 *** (0.000)	0.376 (0.171)
Weighted average maturity	0.069 *** (0.000)	0.059 *** (0.000)
Number of tranches	0.850 *** (0.000)	1.024 *** (0.000)
Number of banks	0.183 *** (0.000)	-0.375 *** (0.000)
Country risk	0.013 (0.812)	0.068 (0.290)
UK borrowers	-1.755 *** (0.001)	0.157 (0.689)
Creditor rights	1.047 *** (0.000)	0.047 (0.767)
Crisis	0.510 (0.463)	-2.601 *** (0.000)
Risk free rate	0.002 (0.509)	-0.001 (0.840)
Volatility	0.024 ** (0.020)	0.035 (0.105)
EUSA5y-Libor3M	-0.002 (0.466)	0.003 (0.317)
Number of observations	4,800	4,388
Log pseudo-likelihood	-848.770	-331.793
Wald statistic	7,408.34 ***	2,684.60 ***
Correct predictions	92.73%	97.39%
Pseudo-R^2	0.436	0.533

Table 6 presents results of logistic regressions, which predict non-financial firms' choice between debt types. In model [1], the dependent variable equals 1 when a firm closes a PF deal and 0 when it issues a CB deal. In model [2], the dependent variable equals 1 when a firm issues an AS deal and 0 when it issues a CB deal. 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. Switcher is an indicator variable equal to 1 if firms used both debt instrument types within our sample period and 0, otherwise. Weighted

average maturity is the weighted average between the tranche maturity and its weight in the deal size. Country risk is the S&P's country credit rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Creditor rights are measured using La Porta, Lopez-de-Silanes, Shleifer and Vishny's (1998) and Spamann's (2010) indices. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2016) and 0, otherwise (January 1, 2000 – September 14, 2008). Risk free rate is the yield on a three-month German Treasury bill. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). EUSA5y-LIBOR3M is the difference between the five-year Euro swap rate and the 3-month LIBOR rate. 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 year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 7: The impact of the financial crisis on the firms' choice

Dependent variable:	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0
Choice of debt	[1a] pre-crisis period	[1b] crisis period	[2a] pre-crisis period	[2b] crisis period
Independent variables:				
Intercept	5.659 *** (0.007)	-1.031 (0.154)	-7.728 *** (0.000)	-0.521 (0.791)
Log total assets	-1.387 *** (0.000)	-0.537 *** (0.000)	-0.220 (0.309)	-0.908 *** (0.009)
Debt to total assets	0.013 * (0.074)	0.002 (0.618)	0.029 * (0.062)	0.003 (0.707)
Short-term debt to total debt	-0.021 *** (0.000)	-0.005 (0.332)	0.025 ** (0.019)	-0.013 (0.607)
Fixed assets to total assets	-0.019 *** (0.000)	-0.008 * (0.069)	-0.012 (0.199)	-0.028 *** (0.000)
Market to book ratio	-0.003 (0.133)	-0.002 (0.389)	0.001 (0.510)	-0.006 (0.219)
Return on assets	-0.077 *** (0.001)	-0.031 *** (0.008)	-0.053 *** (0.005)	-0.033 *** (0.003)
Commercial	-1.763 *** (0.002)	-1.179 *** (0.000)	0.041 (0.941)	-0.664 (0.402)
Industrial	-0.368 (0.428)	-0.460 (0.172)	-0.399 (0.562)	-0.933 (0.245)
Utility and energy	0.095 (0.885)	0.656 ** (0.050)	-0.773 (0.193)	-0.607 (0.469)
Switcher	1.785 *** (0.000)	1.346 *** (0.000)	3.771 *** (0.000)	3.937 *** (0.000)
Log deal size	-3.491 *** (0.000)	-2.240 *** (0.000)	-0.235 (0.475)	0.725 * (0.079)
Weighted average maturity	0.072 *** (0.000)	0.068 *** (0.000)	0.067 *** (0.000)	0.052 (0.130)
Number of tranches	1.348 *** (0.000)	0.695 *** (0.000)	1.563 *** (0.000)	0.773 *** (0.000)
Number of banks	0.286 *** (0.000)	0.151 *** (0.000)	-0.389 *** (0.000)	-0.369 *** (0.008)
Country risk	-0.005 (0.985)	0.046 (0.413)	0.606 *** (0.005)	-0.034 (0.484)
UK borrowers	-3.193 *** (0.000)	-1.371 ** (0.018)	0.116 (0.830)	1.092 (0.465)
Creditor rights	1.691 *** (0.000)	1.088 *** (0.000)	0.389 * (0.084)	-0.856 (0.245)
Risk free rate	0.001 (0.821)	-0.003 (0.578)	-0.001 (0.941)	0.005 (0.110)
Volatility	-0.041 (0.189)	0.047 *** (0.004)	-0.002 (0.954)	0.019 (0.409)
EUSA5y-Libor3M	-0.017 *** (0.000)	0.003 (0.282)	0.005 (0.394)	-0.004 (0.253)
Number of observations	1,776	3,024	1,702	2,686
Log pseudo-likelihood	-214.499	-578.971	-191.005	-114.105
Wald statistic	175.95 ***	1,048.66 ***	5,096.00 ***	2,534.73 ***
Correct predictions	95.32%	92.61%	95.95%	98.75%
Pseudo-R^2	0.601	0.400	0.585	0.414

Table 7 presents results of logistic regressions which predict non-financial firms' choice between PF and CB deals (models [1a] and [1b]) and between AS and CB deals (models [2a] and [2b]) in the pre-crisis (January 1, 2000 through September 14, 2008) and crisis (September 15, 2008 through December 31, 2016) sub-periods. 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. Switcher is an indicator variable equal to 1 if firms used both debt instrument types within our sample period and 0, otherwise. Weighted average maturity is the weighted average between the tranche maturity and its weight in the deal size. Country risk is the S&P's country credit rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Creditor rights are measured using La Porta, Lopez-de-Silanes, Shleifer and

Vishny's (1998) and Spamann's (2010) indices. Risk free rate is the yield on a three-month German Treasury bill. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). EUSA5y-LIBOR3M is the difference between the five-year Euro swap rate and the 3-month LIBOR rate. 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 year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 8: Determinants of firms' choice: the impact of credit risk and funding costs

Dependent variable:	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0
Choice of debt	[3]	[4]	[5]	[6]
Independent variables:				
Intercept	4.481 ***	1.086	-5.190 **	-2.931 *
	(0.007)	(0.341)	(0.045)	(0.056)
Log total assets	-0.765 ***	-0.696 ***	-0.932 ***	-0.874 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Debt to total assets	-0.002	0.008	0.018	0.040 ***
	(0.719)	(0.272)	(0.160)	(0.002)
Short-term debt to total debt	-0.012 **	-0.013 **	-0.013	0.004
	(0.019)	(0.022)	(0.277)	(0.769)
Fixed assets to total assets	-0.023 ***	-0.005	-0.009	-0.021 **
	(0.000)	(0.426)	(0.332)	(0.029)
Market to book ratio	-0.004 **	0.001	0.001	0.001 ***
	(0.014)	(0.408)	(0.130)	(0.001)
Return on assets	-0.037 ***	-0.036 ***	-0.031 *	-0.072 ***
	(0.000)	(0.000)	(0.070)	(0.001)
Switcher	1.436 ***	1.449 ***	4.827 ***	3.313 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Log deal size	-2.499 ***	-3.477 ***	0.692 **	0.311
	(0.000)	(0.000)	(0.044)	(0.400)
Weighted average maturity	0.074 ***	0.057 ***	0.051 ***	0.076 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of tranches	0.838 ***	0.895 ***	1.008 ***	1.018 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Number of banks	0.186 ***	0.251 ***	-0.318 ***	-0.364 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Country risk	-0.001	-0.018	0.094	0.118
	(0.999)	(0.774)	(0.263)	(0.192)
UK borrowers	-1.919 ***	-2.596 ***	-0.526	0.677
	(0.000)	(0.000)	(0.257)	(0.223)
Creditor rights	1.073 ***	1.493 ***	0.279	-0.033
	(0.000)	(0.000)	(0.344)	(0.886)
Crisis	-0.094	0.284	-2.655 **	-1.418
	(0.896)	(0.620)	(0.014)	(0.174)
Risk free rate	0.001	0.001	-0.001	0.001
	(0.753)	(0.648)	(0.879)	(0.558)
Volatility	0.031 ***	0.024	0.038 *	0.066 ***
	(0.004)	(0.211)	(0.077)	(0.000)
EUSA5y-Libor3M	-0.002	-0.006 **	0.005	0.001
	(0.524)	(0.021)	(0.150)	(0.731)
Log z-score	-1.529 ***		-0.966 **	
	(0.010)		(0.025)	
Weighted average spread		-0.001		-0.016 **
		(0.875)		(0.027)
Industry fixed effects	yes	yes	yes	yes
Number of observations	3,619	3,193	3,327	3,127
Log pseudo-likelihood	-663.353	-350.162	-191.152	-174.314
Wald statistic	8,556.64 ***	12,791.90 ***	815.32 ***	2,020.22 ***
Correct predictions	92.29%	96.18%	97.99%	98.15%
Pseudo-R^2	0.455	0.459	0.534	0.601

Table 8 presents results of logistic regressions which predict non-financial firms' choice between PF and CB deals (models [3] and [4]) and between AS and CB deals (models [5] and [6]). 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. Switcher is an indicator variable equal to 1 if firms used both debt instrument types within our sample period and 0, otherwise. Weighted average maturity is the weighted average between the tranche maturity and its weight in the deal size. Country risk is the S&P's country credit rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Creditor rights are measured using La Porta, Lopez-de-Silanes, Shleifer and Vishny's (1998) and

Spamann's (2010) indices. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2016) and 0, otherwise (January 1, 2000 – September 14, 2008). Risk free rate is the yield on a three-month German Treasury bill. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). EUSA5y-LIBOR3M is the difference between the five-year Euro swap rate and the 3-month LIBOR rate. Z-score is computed as proposed by Altman (1993). WAS is the weighted average between the tranche spread and its weight in the deal size. 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 year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 9: Regression analyses of the cost of funding and the debt financing choice

Dependent variable:	[7]	[7a]	[7b]
Weighted average spread (bps)	All deals	All deals | pre-crisis period	All deals | crisis period
Independent variables:			
Intercept	229.803 ***	251.439 ***	432.182 ***
	(0.001)	(0.0013)	(0.000)
PF	-20.865	-22.099	-22.299
	(0.370)	(0.383)	(0.488)
AS	-91.119 ***	-97.803 ***	-164.882 ***
	(0.000)	(0.001)	(0.001)
Log total assets	-61.054 ***	-44.509 ***	-77.431 ***
	(0.000)	(0.003)	(0.000)
Debt to total assets	1.122 ***	0.882 ***	1.304 ***
	(0.000)	(0.004)	(0.008)
Short-term debt to total debt	-0.239	-0.307 **	0.185
	(0.283)	(0.029)	(0.660)
Fixed assets to total assets	-0.503 ***	-0.440 ***	-0.454 ***
	(0.000)	(0.002)	(0.001)
Market to book ratio	-0.044	-0.009	-0.101 *
	(0.148)	(0.654)	(0.081)
Return on assets	-3.057 ***	-2.576 *	-3.051 ***
	(0.001)	(0.068)	(0.010)
Log deal size	-5.957	11.812	-16.994
	(0.636)	(0.302)	(0.306)
Weighted average maturity	2.185 ***	1.621 **	2.438 **
	(0.001)	(0.011)	(0.018)
Number of tranches	-9.383 **	5.172	-14.549 **
	(0.017)	(0.317)	(0.014)
Number of banks	1.921	-1.299	5.893 ***
	(0.108)	(0.185)	(0.001)
Country risk	9.470 **	0.016	10.341 **
	(0.014)	(0.997)	(0.017)
UK borrowers	16.848	14.778	23.216
	(0.101)	(0.319)	(0.155)
Creditor rights	-6.667	-8.237 **	-8.545
	(0.145)	(0.039)	(0.421)
Risk free rate	0.116	-0.052	0.428 *
	(0.231)	(0.247)	(0.080)
Volatility	3.915 ***	2.504 **	3.793 ***
	(0.000)	(0.013)	(0.005)
EUSA5y-Libor3M	0.145	-0.171	0.219
	(0.199)	(0.168)	(0.118)
Crisis	144.126 ***		
	(0.000)		
Industry fixed effects	yes	yes	yes
Number of observations	3,291	1,226	2,065
Adjusted R^2	0.338	0.204	0.293

Table 9 presents the results of OLS regressions analyzing the determinants of PF, AS and CB deals weighted average spread (WAS). The WAS is the weighted average between the tranche spread and its weight in the deal size. For PF loans, the WAS is the sum of the all-in-spread-drawn and the difference between 3-month LIBOR and 3-month German Treasury yield at the time of the closing. For bonds, the WAS is the margin yielded by the security at issue above a corresponding currency treasury benchmark with a comparable maturity. PF equals 1 if the deal is a PF deal and 0, otherwise. AS equals 1 if the deal is an AS deal and 0, otherwise. 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. Weighted average maturity is the weighted average between the tranche maturity and its weight in the deal size. Country risk is the S&P's country credit rating at debt issuance; the rating is converted as follows: AAA=Aaa=1, AA+=Aa1=2, and so on until D=22. Creditor rights are measured using La Porta, Lopez-de-Silanes, Shleifer and Vishny's (1998) and Spamann's (2010) indices. Crisis equals 1 if the issue date falls within the crisis period (September 15, 2008 – December 31, 2016) and 0, otherwise (January 1, 2000 – September 14, 2008). Risk free rate is the yield on a

three-month German Treasury bill. Volatility is the Chicago Board Options Exchange Volatility Index (VIX). EUSA5y-LIBOR3M is the difference between the five-year Euro swap rate and the 3-month LIBOR rate. 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 year. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.