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

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Abstract

We examine the factors that influence nonfinancial firms' choice of issuing standard corporate bonds *vis-à-vis* contracting structured finance transactions, in the form of project finance or asset securitization deals. Using a data set of deals closed by 4,700 European borrowers between 2000 and 2016, we find that informational and agency problems, and issuance costs, affect public firms' borrowing source choices. Findings also suggest that firms choose structured finance borrowings when they are less profitable and have lower asset tangibility. Our findings document that transaction cost considerations lead firms that use both structured finance and corporate bond deals during our sampling period, to choose structured finance for new borrowings. Additionally, firms resorting to project finance are less creditworthy than corporate bond issuers are and, on average, asset securitization deals have a funding cost advantage of 87.6 basis points over corporate bond deals for switchers.

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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1. Introduction

Corporate financial structure go well beyond the choice of the debt-equity mix, encompassing, within the debt claims category, security design features, such as placement and maturity structures, as is the case of standard corporate bond (hereafter, often abbreviated as CB) issuances *vis-à-vis* structured finance (hereafter, often abbreviated as SF) transactions.[1]

In an economy *à la* Modigliani and Miller (1958), the security design choice between 'plain vanilla' CB or SF claims, is irrelevant. In this framework, tranching,[2] 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 and contractual incompleteness, imperfections and frictions of different nature, will make tranching and security design choice relevant.

In the last decades, SF transactions, such as project finance and asset securitization arrangements, have become significant sources of corporate funding (Esty and Sesia 2007; Lemmon *et al*. 2014).[3] Despite their relevance, both in terms of the number and the issuance aggregated market value, prior research on corporate debt financing has devoted relatively little attention to the choice between standard CB and asset-backed structured financing (Leland 2007). Extant empirical literature has examined the relationship between the choice of bank *versus* bond financing and borrowers' financial characteristics, such as size, leverage, liquidity, growth opportunities, and profitability (Houston and James 1996; Johnson 1997; Krishnaswami *et al.* 1999; Cantillo and Wright 2000; Denis and Mihov 2003; and Altunbas *et al.* 2010). More recently, Lin *et al.* (2013) study the effect of ownership structure on firms' debt choices.

To the best of our knowledge, few empirical papers investigate the determinants of SF transactions usage by nonfinancial firms. Among them, Mills and Newberry (2005) examine differences in firms' interest expenses *vis-à-vis* their corporate return as a proxy for SF arrangements that receive different book-tax treatment and find that U.S. firms with lower debt

ratings and higher leverage are more likely to use structured debt financing**.** Using data on publicly traded U.S. firms during fiscal year 2006, Korgaonkar and Nini (2011) show that users of receivables securitization are, on average, larger and riskier than non-users. Lemmon *et al.* (2014) study the U.S. firms' characteristics that are correlated with the initiation of a securitization program, pointing out that securitization users are larger and more concentrated in the middle of the credit quality distribution, and that they use securitization to deleverage. They also suggest that securitization minimizes financing costs by reducing expected bankruptcy costs and providing access to segmented credit markets. This paper aims at filling this gap in the literature examining the factors that, arguably, drive the choice of SF, in the form of project finance and asset securitization, and standard CB.

In this study, we examine a comprehensive sample of project finance, asset securitization, and CB deals closed in 19 European countries during the 2000-2016 period. The sample includes 583 project finance deals (worth €145.11 billion), 168 asset securitization deals (worth €126.03 billion), and 3,949 CB deals (worth €2,615.87 billion).[4] For example, we analyze the financing activity of the French electric utility Électricité de France, S.A. over the 2000-2016 period, when it raised €79.14 billion of debt financing, using both SF (project finance - €4.73 billion - and asset securitization - €2.14 billion) and CB (€72.26 billion), switching 44 times between project finance and CB deals and 10 times between the issuance of asset securitization and CB. Additionally, we also look at the factors that drive construction/heavy engineering firms, like Ferrovial, S.A. and Vinci, S.A., to use so frequently project finance and CB; or Machinery and Equipment firms, like Groupe PSA, S.A. and Renault, S.A., to issue regularly both asset securitization and CB.[5]

Our findings regarding borrower's choice between SF and CB are consistent with the hypotheses related to asymmetric information problems and economies of scale in issuing costs. We also find that borrowers choose SF when they seek long-term financing and are less

profitable. Further, findings suggest that firms that resort to project financing rather than public placed CB have higher credit risk. Firms using asset securitization funding instead of CB, tend to have a larger growth opportunity set and seek funding cost reductions. Results are robust when using multinomial specifications. Moreover, borrowers that access both SF and CB markets – the switchers –, differ fundamentally from those resorting to one market only. Our results indicate that transaction cost considerations may lead switchers to choose SF for new debt funding, and firms with larger growth opportunities and higher levels of asymmetric information, that use both asset securitization and CB, are more likely to choose SF. Finally, in line with SF literature, our results indicate that, *ceteris paribus*, the weighted average spread is significantly lower for AS deals than for CB. However, our results show that the borrowing cost on project financing does not differ significantly from the borrowing cost on standard bond financing.

We contribute for the literature on debt financing choices in several ways. Firstly, unlike prior research, our analysis distinguishes between SF and CB financing. Albeit SF is widely acknowledged as an economically significant and growing financial market segment, academic literature is scanty, therefore warranting further research. Secondly, the European market, being one of the largest SF markets, has been relatively under-researched. Thirdly, we shed light on the economic rationales for off-balance-sheet activities by nonfinancial firms. Fourthly, we extend Mills and Newberry´s (2005) work by including project finance deals as a type of off-balance-sheet SF transactions. In addition, and unlike prior research, we examine the choice of new corporate borrowings, rather than the proportions of existing debt financing, assuring that firms in our sample have a non-zero demand for debt financing. Finally, we also extend Lemmon *et al.´*s (2014) work by estimating the cost of funding reduction for an originator using asset securitization *versus* CB.

The remainder of the paper is organized as follows. The next section discusses theoretical and empirical backgrounds regarding corporate borrowings, linking it with the SF and the security design literatures. Section 3 presents methodology and describes data. Section 4 examines the determinants of firm debt choices and discusses our robustness checks. Section 5 contrasts the cost of funding of SF and CB deals. Section 6 concludes the paper.

2. Theoretical background and hypotheses

Standard CB and SF are important sources of corporate funding. The CB market is the largest security market for corporate debt financing (Fabozzi *et al.* 2006). However, there is also a significantly large market for SF instruments, like those issued via asset securitization (hereafter, often abbreviated as AS) and project finance (hereafter, often abbreviated as PF).

SF is an off-balance-sheet contractual arrangement designed to fund a specified asset, or a segregated pool of assets or cash flow stream, setting up a special purpose vehicle (SPV) to implement the transaction. SF can usefully be conceptualized as a 'nexus of contracts', designed, namely, to curtail asymmetric information problems, mitigate agency conflicts, and promote risk sharing between borrowers and lenders (Caselli and Gatti 2005; Corielli *et al.* 2010). According to extant literature, SF transactions can be used: (*i*) to fund projects which otherwise could not be financed; (*ii*) to lower funding costs; (*iii*) to allow originators/sponsors maintaining their financial flexibility; (*iv*) to promote more effective and efficient risk sharing; and (*v*) to lower income tax liability (Caselli and Gatti 2005; Fabozzi *et al.* 2006; Leland 2007). The literature also documents that SF is prone to inefficiencies, particularly, when used inappropriately or imprudently (Gorton 2009; Gorton and Metrick 2013).

PF is an off-balance sheet non-recourse funding arrangement of large-scale and capital-intensive investments, typically highly levered and with concentrated ownership. In PF deals, project's cash flows are the main source for borrowing reimbursement, whereas project's assets serve as collateral. Due to its contractual idiosyncrasies, PF arrangements are also useful in

segregating project's credit risk from the sponsors' (John and John 1991; Gatti *et al.* 2013). The main economic drivers of PF transactions include: (*i*) reductions in the cost of funding induced by the mitigation of the deadweight costs of principal-agent conflicts and asymmetric information problems; (*ii*) the preservation of project sponsor's financial flexibility; (*iii*) the debt tax shields; and (*iv*) gains in risk management (Kleimeier and Megginson 2000; Esty 2003; Corielli *et al.* 2010).

AS arrangements allow cash flow generating assets to be pooled together and transferred to an SPV, and transformed into publicly or privately placed debt instruments (Gorton and Metrick 2013). A key element in AS deal is issuer's obligation to repaying investors being backed by the value of a pool of financial assets, or any form of credit enhancements provided by third parties to the transaction. For specific types of nonfinancial firms, AS has been, recurrently and extensively, used for managing portfolios of cash flow generating assets, namely, trade and lease receivables. Prior research suggests that the contracting design of AS arrangements aims at (*i*) improving working capital management; (*ii*) mitigating deadweight informational and agency-costs associated with straight debt financing; (*iii*) deleveraging capital structure, reducing bankruptcy risk, and lowering the cost of capital; (*iv*) benefitting from accounting and fiscal advantages; and (*v*) improving liquidity condition and easing financial constraints (Mills and Newberry 2005; Dechow and Shakespear 2009; Ayotte and Gaon 2010; Korgaonkar and Nini 2011; Lemmon *et al.* 2014).

Mainstream theoretical work on security design specify a contracting technology, including actions observability and contractibility, ability to renegotiate, the nature of information, and parties' risk preferences. For these models, external financing is optimally raised under the form of debt contracts. In this framework, optimal securities should resolve, among others: (*i*) principal-agent conflicts and informational problems between managers / owners and financiers; (*ii*) the allocation of cash flow rights and risks; and (*iii*) the allocation

of ownership and control rights. The combined arguments of property rights, and therefore incentives, asymmetric information and extended self-interest, provide a useful rational for the security design problem of firms' debt financing choice (Townsend 1979; Gale and Hellwig 1985; Allen and Gale 1989; Harris and Raviv 1989; Aghion and Bolton 1992; Allen and Winton 1995; Hart 2001).

Incentives within borrowers-lenders agency relationships create potential for contractual opportunism. In this framework, rational value maximizer lenders have incentives to adopt indenture provisions, and involve in monitoring and bonding, to mitigate the magnitude and the severity of such agency costs (Myers 1977; Smith and Warner 1979; Stulz and Johnson 1985; Jensen and Smith 1985; Esty 2003). With marginal agency costs of debt rising monotonically on the leverage ratio (Jensen and Meckling 1976), we expect borrowers exhibiting higher debt ratios to have an incentive to prefer SF to CB, because the idiosyncratic contracting features of asset-backed structured financing may lower expected agency costs of borrowing.

Blackwell and Kidwell (1988) argue that private placements of debt are associated with lower agency costs than public sales. Additionally, financially constrained borrowers, exhibiting higher probability of financial distress, are less likely to borrow publicly (Denis and Mihov 2003; Fiore and Uhlig 2011), and more propense to borrow long-term (Diamond 1991a). Because of extensive restrictive covenants, lenders' monitoring, and *ex post* renegotiation, SF transactions resemble more closely private placement bonds than (publicly offered) CB (Kwan and Carleton 2010). Therefore, we expect borrowers seeking to minimize the deadweight costs of imperfect and frictional debt markets, to prefer SF borrowings *vis-à-vis* CB public placements.

Informational problems play a significant role in the security market choice (Fulghieri and Lukin 2001; Gomes and Phillips 2012). Models of this literature predict that firms facing

higher degrees of asymmetric information are more likely to borrow privately (Diamond 1991b; Boyd and Prescott 1986; Krishnaswami *et al.* 1999; Denis and Mihov 2003; Fiore and Uhlig 2011). Therefore, we expect that privately placed borrowings, because they disclose private information to a limited number of informationally sophisticated investors, being helpful in mitigating informational asymmetries (Carey *et al*. 1993). SF arrangements are structured as extensive and detailed networks of contracts among the parties involved, which are typically disclosed to lenders, lowering significantly their levels of informational asymmetries (John and John 1991). Furthermore, PF may mitigate leverage-induced underinvestment behavior through separate incorporation and nonrecourse debt issuance (Brealey *et al.* 1996; Esty 1999). PF contracting structure may also enhance lender's verifiability of cash flow realizations, by stipulating contractual constraints on cash flows and private enforcement (Corielli *et al.* 2010). Additionally, tranching may also be helpful in lessening asymmetric information problems in AS contracting. Riddiough (1997), Fulghieri and Lukin (2001), and DeMarzo (2005) point out that originators can reduce asymmetric information costs by pooling assets and issuing securities, with different degrees of seniority, against the pool of cash flows.

H1 - Borrowers with lower levels of asymmetric information are more likely to choose public placement borrowings.

H2 - Borrowers exhibiting higher financial leverage ratios are more likely to contract SF borrowings.

Rational value maximizing borrowers should choose borrowings' design aiming at minimizing expected issuance costs, in the form of flotation, and agency and informational costs typically associated with borrowing contracting. However, as posited in Devereux and Schiantarelli (1990), flotation and underwriting costs are negatively related with the value of the issue. Therefore, real-world borrowing decision-makers should aim at capturing the

economies of scale associated with issuing costs of new debt securities issuance (Altinkiliç and Hansen 2000; Grinblatt and Titman 2002). Additionally, Blackwell and Kidwell (1988) provide evidence consistent with the argument that larger issues benefit from economies of scale in flotation costs.

Structuring costs of PF arrangements are, typically, higher than standard CB offerings, because PF deals are expensive to set up, take a long time to execute, and are highly restrictive once in place (Fabozzi *et al.* 2006; Gatti *et al.* 2013). Esty (2003) estimates transaction costs to be around 5 percent of the PF deal value. Similarly, Fender and Mitchell (2005) and Fabozzi *et al*. (2006) point out that AS transactions have higher transaction costs *vis-à-vis* CB. Davidson *et al.* (2003) stress that AS transactions have relatively higher up-front (legal, auditor, and listing fees, and with rating agencies, underwriters, setting-up the SPV, and arrangers) and ongoing (with trustees auditors, paying agents, rating agencies, calculating agent, and servicer) costs *vis-à-vis* traditional bonds. Authors estimate, for a Euro 100 million AS transaction in Europe, that these costs add to the overall financing costs about 15 to 50 basis points, assuming a 7-year bullet bond issuance. These empirical regularities are also documented in Esty (2004) and Cardone-Riportella *et al.* (2010).[6] Therefore, we expect borrowers to choose SF for larger debt borrowings because of the potential economies of scale on flotation costs.

H3 - Because of the economies of scale in issuing costs, larger borrowings are more likely to be arranged privately through SF deals.

The scope of a typical SF nonfinancial contractual network includes a comprehensive set of 'contracts that generate cash inflows and outflows that affect the unlevered free cash flows of the SPV' (Corielli *et al.* 2010). In contrast with CB, SF contractual arrangements provide a framework for, namely, asset collateralization and restrictive covenant stipulation, lowering asset riskiness and decreasing expected default costs (Smith and Warner 1979; Bernanke and Gertler 1986; John and John 1991). This framework, arguably, reduce borrowing

costs by mitigating deadweight costs of market imperfections and frictions, and improving risk profile (Esty 2003; Caselli and Gatti 2005; Fabozzi *et al*. 2006; Lemmon *et al*. 2014). If SF transactions facilitate lower borrowing costs relative to traditional funding sources, the weighted average spread for CB deals should exceed that of PF and AS deals.

H4 - SF deals allow the reduction of borrowing costs when compared with public placed CB deals.

3. Methodology, data, and sample characterization

3.1. Methodology

The main objective of our analysis is to investigate how European borrowers choose between corporate and structured financing, namely, how firm's characteristics, contractual features, and the macroeconomic environment affect the choice between AS and CB deals and PF and CB deals.[7] In this analysis, we estimate a logistic regression model.[8] The dependent variable, choice of debt, is a binary variable equal to 1 if the sponsor/originator choose a PF deal or an AS deal and 0 if it, instead, choose a CB deal:

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

where the subscripts denote the deal *i* at time *t*. Next, we identify the explanatory variables used as well as the expected impact on the choice process.[9] *Firm size* and asset tangibility, proxied by fixed-to-total assets, are our surrogates for incentive problems related to information asymmetries (Denis and Mihov 2003; Altunbas *et al.* 2010). Thus, we expect smaller firms and those with lower degree of asset tangibility, to prefer PF and AS to CB. We also use market-to-book ratio to gauge a firm's growth prospects (Smith and Watts 1992; Barclay and Smith 1995). Because future cash flows streams enables a firm securitizing assets, we expect a positive association between the market-to-book ratio and the probability of choosing AS over CB. Similarly, PF allows firms with higher growth opportunities to avoid

the opportunity cost of underinvestment. To investigate if 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 ratios as proxies for borrowers' level of financial constraint (Houston and James 1996; Krishnaswami *et al.* 1999; Altunbas *et al.* 2010). Assuming that both PF and AS deals are, mostly, off-balance-sheet arrangements, we predict that higher levered firms will choose SF over CB to improve or maintain key financial ratios (Caselli and Gatti 2005; Mills and Newberry 2005; Fabozzi *et al.* 2006). According to Denis and Mihov (2003), profitable firms are more likely to utilize public debt to signal managerial prospects of future earnings. Therefore, we expect return-on-assets to be inversely related to the probability of SF issuance.

We expect firms to choose SF for relatively large amounts of debt to capture expected economies of scale associated with borrowing. We use *deal size* as a proxy for economies of scale on issuing/originating costs associated with borrowing contracting. Because firm size can also test the issuance costs argument (Krishnaswami *et al.* 1999; Denis and Mihov 2003), we expect relatively larger firms to prefer PF and AS over CB.

SF arrangements are typically structured as extensive and detailed networks of contracts, enhancing the previsibility of expect cash flow streams and, consequently, allowing SPVs to raise funding with longer maturities (John and John 1991; Fabozzi *et al.* 2006; Gatti *et al.* 2013). Moreover, the asset collateralization potential of SF arrangements creates an incentive for leveraging up SPVs' financing structure, reducing borrowing costs and extending its maturity (Almeida and Campello 2007). Therefore, we expect that a borrower seeking longer-term funding will choose PF and AS over CB.

Because financing choice may be sector-specific, we use dummy variables to control for industry factors. Since our hypotheses are cross-sectional in nature, we include the country risk variable to account for any time trends and sovereign risk changes that might influence inference. Additionally, a dummy variable - *switcher* - identifies firms that employ multiple

debt types - both SF (AS or PF) and CB deals - within the sampling period. Finally, we account for macroeconomic conditions using proxies for interest rate levels, market volatility, and the term structure of interest rates, along with dummy variables for financial crisis and U.K. firms.[10]

3.2. Data

We draw data for this analysis from four different sources. We use DCM Analytics and Loan Analytics databases to select the European nonfinancial firms that issued CB, were sponsors in PF deals and originators in AS deals in the 2000-2016 period.[11] 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. 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) and "mortgage-backed security" (MBS) 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. In order to avoid autocorrelation in the dependent variable, we excluded ABCP programs, which typically allow firms to maintain their securitization programs for many years. We also excluded collateralized debt obligations, both funded and synthetic deals. Regarding Loan Analytics, 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 draw 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.[12]

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 closing date.

3.3. Distributional characteristics of the sample

3.3.1. The full sample

After applying the defined screens to data from the DCM Analytics and Loan Analytics databases, we end up with a full 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. During the 2000-2016 sampling period, the SF full subsamples represent almost 90% and 94% of the European AS and PF markets, respectively. As the unit of observation is the deal, multiple tranches from the same transaction appear as separate observations in our database. Therefore, to perform a deal-level analysis we use data at the deal-level and, when necessary, we aggregate tranche-level data (spread and maturity). Table 1 presents the distribution of the full sample by year, while Figure 1 describes the distribution of the percent of total value per year.

****** Insert Table 1 and Figure 1 about here ******

Table 1 and Figure 1 show that the aggregated value of PF lending peaked in 2008, dropped in 2009 and rose again in 2010 and 2011. In 2016, a record of €49.40 billion in PF arrangements was hit, a 269.3% increase from the €13.38 billion euros reported for 2000. The

issuance of AS arrangements rose significantly until 2006, reducing sharply between 2007 and 2009, coinciding with the development and the propagation of the 2007-2008 financial turmoil. The increase in the AS market resumed between 2012 and 2014, but it seems there is a lack of a bounce back effect in more recent years. The CB market experienced a significant increase in the volume during the 2012-2016 period. Overall, €699.79 billion were raised through SF deals, which represent 20.10% of the amount raised through CB. Table 1 also shows that although this percentage does not change significantly, the distribution between PF and AS is quite different: the total value of AS financing decreases significant in 2008-2011 and 2015-2016 periods. However, the percentage of PF financing to the all funding in those years has exactly opposite changes.

Panel A of Table 2 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 PF deals are concentrated in three key industries: utilities (36.30%), construction/heavy engineering (20.24%) and transportation (15.16%) account for 71.70% of all PF lending by volume. AS deals are concentrated in machinery and equipment, real estate, and public administration/government with these industries representing, respectively, 19.35%, 18.93%, and 18.27% of all AS lending. CB deals reveal a far less concentrated industrial pattern *via-à-vis* SF lending, with communications (18.05%), machinery and equipment (15.50%) and utilities (15.34%) industries receiving the highest shares of all CB issuance.

****** Insert Table 2 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. 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.

Table 3 provides descriptive statistics for our full 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 3 about here ******

The weighted average spread (WAS) - estimated as the weighted average between the tranche spread and its weight in the deal size (see section 5.1.) - corresponds to the deal's economic cost of credit based on available information at the time of closing the loans or issuing the bonds. In an AS transaction, deals' number of tranches as well as their size and rating is determined by the expected cost of borrowing. Similarly, in PF deals, lenders work with sponsors to determine the number and seniority of tranches, whether the project is financed through the issuance of bonds or syndicated loans. Thus, in SF, the deals' cost of borrowing is determined by the combination of the different tranches. The mean (median) WAS for CB is 235.63 bps (165.40 bps); mean (median) WAS for PF and AS deals are 222.28 bps (180.60 bps) and 63.57 bps (45.73 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 is not significantly different at the 1 percent level, for PF and CB deals.

As expected, mean (median) AS deal size of €734.90 million (€469.94 million) significantly exceeds that of CB deal size. On the contrary, the mean (median) PF deal size of €220.44 million (€99.00 million) is significantly less than the CB mean (median) deal size of €567.69 million (€350.00 million).[13] Regarding country risk, we find that while PF borrowers

are, on average, located in far riskier countries (2.80) than CB issuers (2.36) are, AS originators are located in countries with lower sovereign risk (1.72). The weighted average maturity (WAM) of SF deals - 14.57 years and 16.57 years for PF and AS, respectively - is significantly higher than that of 8.80 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.[14] Similarly, PF loan and bond maturities typically reflect maturities of the projects implemented by the SPV, which tend to have long useful economic lives. Overall, results indicate that AS and PF WAMs tend to be longer *vis-à-vis* traditional CB WAMs.

AS and PF deals typically include a larger number of tranches than CB issues. On average, CB deal includes 1.33 tranches while average PF and AS deals have 2.04 and 2.80 tranches, respectively. For PF deals, the average number of participating lenders is 5.05, which is significantly larger than the average for both AS (2.70) and CB deals (4.48). This is consistent with the view that lenders may attempt to maximize the number of PF participants to spread out the risk. The fraction of AS bonds issued by U.K. corporates, 40.26%, is significantly higher than that for CB (23.77%) and PF (20.46%) deals. Contrary to AS, during the crisis period European corporates made much more frequent use of PF and CB deals than in the pre-crisis period. Finally, while the largest share of AS deals was awarded to machinery and equipment and real estate industries, the bulk of PF lending is extended to capital-intensive sectors like utilities and construction/heavy engineering.

3.3.2. The high-information sample

To avoid selection bias problems in studying the determinants of choice, we select from the full sample those deals arranged in industries where SF and CB transactions are frequently used. It is not meaningful to compare, for example, an automotive firm issuing AS

(collateralized by car loans) with a company in the mining and natural resources industry, using CB but not AS deals to financing its activities. Table 4 presents information for a subsample of deals implemented by switchers, firms that closed two types of deals - PF and CB or AS and CB - during the sampling period. Regarding the use of PF and CB deals, results indicate that there are no switchers in three industries: (*i*) agriculture, forestry and fishing; (*ii*) food and beverages; (*iii*) and steel, aluminum and other metals. In addition, we do not find evidence of switchers between AS and CB for seven industries. For these industries, we assume that the firms' access to SF and CB markets may be dissimilar, thus, we excluded deals closed in these industries from the full sample when determining our high-information sample. Table 4 also shows that PF and CB deals implemented by switchers are concentrated in four industries: utilities (61.54%), machinery and equipment (10.92%), construction/heavy engineering (10.88%) and transportation (8.08%), account for 91.42% of the total debt raised. Similarly, machinery and equipment (54.34%), utilities (16.88%), transportation (7.94%), real estate (7.52%), and retail trade (4.86%) industries concentrate 91.53% of the total debt amount raised through AS and CB switchers. We refer to these industries as our core industries, and we consider them to conduct robustness checks in section 4. For further analysis of the firms that issued both SF and CB during our sample period, see Appendix A.

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

After applying the above-defined screens, hand-matching firms involved in the deals with Datastream's accounting and market data, and winsorizing firms' characteristics at the 1st and 99th percentiles, we identified 4,700 firms for which we have all of the necessary data for the analysis. Of these firms, 583 were sponsors in PF deals, 168 originators in AS deals, and 3,949 issuers in CB deals. We refer to this sample as our high-information sample. Table 5 reports characteristics of nonfinancial firms segmented into six categories according to their borrowing record in 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, have lower short-term debt levels, and lower profitability, than those accessing exclusively CB markets. 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 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

4.1. Base model results

Models [1] to [8] of Table 6 report the results of the logistic regression (1) to predict firms' choices of debt between PF and CB deals and between AS and CB deals. Estimations were developed following a stepwise approach, focusing firstly, on all the firms that closed only one type of debt, either PF or CB deals (category [I] and category [II] firms, in Table 5) as well as either AS or CB deals (category [IV] and category [V] firms). Subsequently, the same estimation method was extended to include also firms that used both instruments during the period of study, the switchers. This sample includes all of category [III] firms in models [2] and [3], and category [VI] firms in models [6] and [7]. Finally, we implemented the regressions for a subsample of firms belonging to the core industries - models [4] and [8].

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

We find that firms with potential asymmetric information problems, relatively smaller firms and those with lower degree of asset tangibility, prefer PF *vis-à-vis* CB deals (models [1] and [2]). Concerning the choice between AS and CB, similar results are obtained when we include switchers in our sample - model [6].

Contrary to what we expected, deal size negatively affects the probability of observing PF instead of CB. Considering that firm size can also test the economies of scale on issuing costs, in models [3] and [4] as well as in models [7] and [8], we add the interaction between firm size and deal size to further examine the impact of these variables on the choice process. Results show that firm size positively affects the likelihood of observing PF or AS rather than CB, but this effect reduces as deal size increases. This can be interpreted as that for larger investment projects (in PF) or transactions (in AS), particularly those with a strong impact on the firms' balance sheet and, therefore, suffering more from the deadweight costs of information asymmetries, firms would prefer SF over CB to mitigate those problems. That is, the implementation of considerably larger transactions through SF is more likely for relatively smaller firms. Results also show a significant positive impact of deal size in the choice of both

PF and AS deals and that this effect reduces as firm size increases; i.e., while smaller firms choose AS and PF for relatively larger amounts of debt to economize on scale, larger firms may prefer financing investment projects on-balance-sheet through CB deals because they will have little impact and thus do not affect firms' key financial ratios. Thus, we find evidence that firms choose PF and AS *vis-à-vis* CB when issuing larger amounts of debt to benefit from economies of scale.

We find that while the market-to-book ratio does not affect the probability of observing a PF deal, when we include switchers in our sample - models [6] to [8] - there is a significant positive relationship between the market-to-book ratio and the probability of observing an AS deal. Results document that financial leverage does not affect the choice between SF and CB deals. Contrary to what expected, we report a negative relationship between the short-term debt level and the likelihood to access PF markets when considering firms belonging to the core industries - model [4]. This might be explained by the fact that PF transactions take more time and entails greater transaction costs than CB. 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 find that profitability reduces the likelihood of accessing both PF and AS markets, which corroborates SF literature (Caselli and Gatti 2005; Fabozzi *et al.* 2006) that states that firms choose off-balance-sheet over on-balance-sheet financing to improve sponsors' key financial ratios. Results also show clearly that firms, which employ both SF and CB within our sample period, switchers, are more likely to choose SF deals when issuing new debt. Our findings also document that WAM increases the probability of a firm choosing a SF deal, which are consistent with the prediction that by reducing the level of asymmetric information between lenders and borrowers, SF enables borrowers to raise funding with longer maturities (Flannery 1986; Diamond 1991a).

Results document that macroeconomic variables country risk, level of interest rates, and the yield curve slope, as well as dummy variables for 'crisis' and 'U.K. borrowers' do not affect the choice between PF and CB deals. In addition, we only find that in periods of higher volatility in capital markets firms tend toward PF, in Model [1]. A new deal closed by an originator located in the U.K. is more likely to be structured as AS than CB. 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 period. The country risk, with the exception of model [5], does not affect the probability of observing an AS deal rather than a CB deal. Note, though, that the level of interest rates and the yield curve slope only affect (negatively) the likelihood of observing an AS *versus* a CB deal in model [4], and that the relationship between market volatility and the probability of observing an AS deal is significant (and positive) in model [8] only.

Overall, we find strong evidence that SF facilitates the reduction of the deadweight costs from asymmetric information problems, which corroborates H1. Our results also corroborate the economies of scale in issuing costs hypothesis for both PF and AS [H3], but we do not find evidence that borrowers with high agency costs of debt are more likely to choose SF over CB [H2]. 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 SF deals over public placed CB are larger and less profitable, and have lower asset tangibility than CB borrowers have. Finally, while core industries' firms using PF have lower short-term debt-to-total debt ratios, firms that prefer AS have more growth opportunities.

4.2. Multinomial specification

The previous section examines the firms' choice between PF and CB or between AS and CB. However, firms can choose among the three deal types. In addition, Table 1 shows

that there is a substitution effect between AS and PF deals in 2008-2011 and 2015-2016 periods. To scrutinize the data further, we use a multinomial specification in which the dependent variable *choice of debt* takes the value 1 if the firm issues an AS deal, 2 if the firm closes a PF deal, and 3 if the firm issues a CB deal. Results presented in columns 9 and 10 of Table 6 are consistent with the findings reported for binominal logistic regressions.

Our results corroborate the hypotheses related to asymmetric informational problems and economies of scale in issuing costs. Borrowers choose SF when they seek long-term financing and are relatively larger, less profitable, and exhibit lower asset tangibility. Further, findings suggest that firms using asset securitization funding instead of CB tend to have a larger growth opportunity set and higher short-term debt-to-total debt ratios. Results also indicate that transaction cost considerations may lead switchers to choose SF for new debt funding.

4.3. The role of credit risk and funding costs, and switchers' debt choices

In this section, we conduct the various high-information samples to binominal logistic regression, with three main objectives. First, to examine whether the credit risk of firms affect the choice between SF and CB. According to 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 terms. 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.[15] Second, to investigate whether the cost of funding affects the firms' debt choice [H4]. Finally, to examine the choice determinants for switchers. Nonfinancial firms that switch between SF and CB, those that in fact use extensively both on- and off-balance-sheet debt, may provide interesting insights into the choice process.

Results, reported in models [10] and [13] of Table 7, indicate, as expected, that the less creditworthy firms, on average, prefer PF to CB deals. In PF, the off-balance-sheet treatment of the funding raised by the SPV is crucial for sponsors, since it only has limited impact on

sponsors' creditworthiness, and does not impact sponsors' ability to access additional financing in the future. Hence, firms with lower Z-scores prefer PF to CB as it prevents contamination risk. However, we did not find evidence supporting Mills and Newberry's (2005) argument that credit-constrained firms use more AS transactions.

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

Concerning the impact of WAS on the choice between SF and CB deals, results document that, while there is an insignificant relationship between our cost of borrowing proxy and the probability of observing a 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 choose AS deals to reduce the cost of borrowing. We investigate this effect further in section 5, where we examine whether or not off-balance-sheet debt financing is more expensive than CB deals, after controlling for other micro and macro pricing characteristics. We also find evidence, when controlling for Z-score and WAS, that more levered firms tend to choose SF over CB. In this context, our results show that PF and AS transactions more effectively mitigate agency conflicts between borrowers and lenders.

Column 2 of Table 7 shows that switchers resorting to PF are less profitable and seek long-term funding. Our results are, thus, in line with the idea that PF transactions allow sponsors to obtain funding with longer maturities, maintain financial flexibility and protect their credit standing and future access to syndicated lending by creating non-recourse vehicle entities to carry the debt. Concerning the choice between AS and CB deals, results presented in model [14] show that switchers choose AS for relatively large amounts of debt to economize on scale. Results also show that firms that prefer AS to CB have more growth opportunities, are less profitable, and seek long-term funding.

4.4. Robustness checks

In this section, we report the results of some robustness checks we have undertaken. First, we re-estimate models [11] and [14] by controlling for an alternative measure of asymmetric information: EPS surprise. We find that while *EPS surprise* variable positively affects the likelihood of observing an AS deal, it does not influence the choice between PF and CB deals. This is consistent with the notion that in a typical PF contracting model, asset collateralization and restrictive covenants are a useful mechanism to enhance cash flow predictability. Second, we re-estimated models [1] to [8] after adding La Porta's *et al.* (1998) and Spamann's (2010) indices and the type of law regime - civil law *versus* common law - as investor protection measures, along with a measure for local factors - GDP per capita logarithm -, and we find that our results do not change qualitatively. Third, we investigate the role of a firm's reputation on the choice between SF and CB. 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 [10] and [13] 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, negative for PF and insignificant for AS, and our estimates for the remaining variables are not affected by it. Thus, contrary to Lemmon *et al.* (2014), we do not find a concave relationship between the usage of AS and firms' credit risk. Finally, we examine whether debt financing choices change over time. Specifically, we test the robustness of our results by re-estimating our base models for two subsamples: pre-crisis period, incorporating all deals before the Lehman Brothers bankruptcy on September 14, 2008, while transactions thereafter occur in the crisis period. Overall, our estimates remain unchanged.

5. Cost of funding and firms' debt choice

5.1. Methodology

In H4 we argue that if SF transactions facilitate lower borrowing 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 the paper, we test this hypothesis by using the model specified in equation (2). The dependent variable is the WAS, and we specified 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 and cross-country differences, we estimate standard errors clustered by year and country. In estimating equation (2), the dependent variable WAS, a proxy for the overall cost of credit, is computed. The WAS is the weighted average between the tranche spread and its weight in the deal size. The calculation of WAS requires information on the spread for all the tranches (including the tranche first loss for AS). For PF loans, the credit spread represents the spread paid by the borrower over Euribor or 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).[16] Comparability of 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. Following 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.[17]

5.2. Results

Column 1 of Table 8 - model [16] - reports estimates of equation (2) for a sample of 126 PF and 1,358 CB deals. Results suggest that PF deals' cost of borrowing does not differ significantly from that of CB deals. On the other hand, results reported in column 4, for a sample of 99 AS and 2,852 CB, document that AS transactions in Europe, holding other factors constant, are associated with lower WAS. Despite our results show a lower cost of debt associated with AS usage, it is not clear that creating lower risk ABS and MBS securities can reduce a firms' overall cost of funding. Therefore, creating AS securities may result in higher overall financing costs, because the seniority of AS securities on the securitized assets makes the outstanding on-balance-sheet debt subordinated to new debt. Additionally, in Models [16] and [19] PF and AS dummies may suffer from sample selection bias, because we only observe borrowing costs for the debt type that issuers choose; we do not observe counterfactual borrowing costs.[18] To account for this problem we re-estimate these models considering a subsample of deals closed by switchers. Results show, again, that AS deals have lower WAS than CB deals, since the AS dummy variable is associated with a statistically significant 87.55 bps drop in WAS. Once more, PF deals WAS does not differ from that of CB deals.[19] The robustness of our results was tested by re-estimating our models for a matched sample. We follow the approach of Lemmon *et al.* (2014) and match each PF and AS deal to a CB deal closed in the same year based on firm size and Z-score. We match (with replacement) each PF sponsor or AS originator to no more than five CB issuers in the same industry and in the same total asset decile with the closest Z-score. If there is not five firms in the industry, we use as many as possible. Results presented in columns 3 and 6 of Table 8 show, again, that while PF deals WAS does not differ significantly from that of CB, AS deals are associated with lower WAS.

Finally, as the choice between SF and CB deals may be endogenous, we re-estimate models [16] and [19] using an endogenous switching regression model [Lokshin and Sajaia (2004)] to study the pricing, taking into consideration the potential self-selection by firms between issuing SF *versus* CB. We use as our selection equation the model specified in equation (1) while WAS regressions follow the model specified in equation (2). We calculated the expected values of WAS for SF and CB conditional on the debt choice and implemented a two-sample t-test assuming unequal variances. Results show that CB deals have higher WAS than AS deals while PF deals' WAS is higher than that of CB deals. Our findings are thus consistent with the proposition that AS reduces funding costs *vis-à-vis* standard CB by mitigating costs induced by agency and informational problems.

6. Summary and conclusions

This paper provides empirical evidence on corporate borrowing decisions. Results document that sampled firms' characteristics, like size, profitability, leverage, asset tangibility, growth opportunities, and credit risk influence the firms' choice between structured finance and corporate bond deals. Findings are consistent with the hypothesis that structured finance promotes the reduction of the deadweight costs associated with information asymmetries and provide support for the economies of scale in flotation costs hypothesis of debt choice between project finance and corporate bonds and between asset securitization and corporate bonds. Findings are also consistent with the prediction that transaction cost considerations lead switchers to choose structured finance for new borrowings, and that sponsoring and originating firms choose asset-backed deals when seeking long-term financing.

The paper also reports 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 those two categories of borrowing sources, based on the efficiency of the cost of borrowing for the available financing alternatives. Therefore, we

argue that further research exploring if structured finance transactions reduce sponsors' or originators' overall cost of capital, as well as on firms' relative use of these funding sources, could be particularly useful and valuable. Finally, as project finance deals are funded mainly through nonrecourse syndicated loans, we consider that a further analysis of the firms' choice between project financing and corporate financing using the corporate syndicated loan market is also an important avenue for future research.

Notes

1. According to Roever and Fabozzi (2003), Caselli and Gatti (2005), and Fabozzi *et al.* (2006), asset securitization, project finance, structured leasing, and leveraged acquisitions (mostly LBOs), are all different forms of SF. In our study, we focus on project finance and asset securitization, because there is no public information on structured leasing transactions and some LBOs are implemented without an SPV, which is a key element of an SF deal.
2. 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.
3. Considering project finance funding, in 2017, $51.5 billion and $42.5 billion were closed in Europe and the U.S., respectively - $229.6 billion arranged worldwide during 2017, 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 was smaller than both the corporate bond and the asset securitization markets in 2017. However, the amount invested in project finance was larger than the amounts raised through IPOs or venture capital funds. Asset securitization, after the financial crisis years, has rebounded. According to the Securities Industry and Financial Markets Association, $3,197.9 billion of securities were issued in Europe between 2009 and 2017, which compares with the $3,614.7 billion issued in the 2000-2008 period.
4. We used DCM Analytics database to identify nonfinancial firms that were borrowers in CB issuances, sponsors in project finance bond deals and originators in asset securitization deals. We also used Loan Analytics database to find non-identified sponsors in project finance syndicated deals.
5. For an analysis of the firms that closed both SF and CB during our sample period, switchers, see Appendix A.
6. Our data provides evidence supporting that SF transactions induce higher up-front and ongoing fees when compared to CB: the average management fee is 45 bps for PF bonds, 26 bps for AS bonds, and 22 bps for CB. To this amount, in PF sponsors support an average up-front fee of 69 bps. Similarly, servicing fees in AS are, on average, 24 bps.
7. Although our sample only includes 8 firms using both AS and PF deals in our sample period (Atlantia, SpA; ACS - Actividades de Construcción y Servicios, S.A.; Bouygues, S.A.; Balfour Beatty plc; Ferrovial, S.A.; Électricité de France, S.A.; Foncière des Régions; Galp Energia, SGPS), in section 4.2 we examine the choice among AS, PF and CB in a single model, using a multinomial specification. In this framework, switcher means a firm that switches between the three debt instruments. For example, in 2011, Électricité de France, S.A. issued €223 million of CB on April 9, closed a PF deal with an amount of €289 million on June 8, issued €691 million of ABS on June 19, issued €1,080 million of CB on July 7, and issued €800 million of CB on October 4; switching 4 times between deal types.
8. 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.
9. An appendix with the definition of variables and key findings is available upon request.
10. The supply-side of debt markets differ across countries, industries, and time. In our model, we control for country risk, interest rate level, yield curve slope, market volatility, and industry dummies to account for these supply-side conditions.
11. In this study, we define European countries as Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

12. 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').
13. These results can be explained by the fact that: (*i*) AS deals have relatively higher up-front fixed costs *vis-à-vis* traditional bonds; and (*ii*) PF is typically loan based or buy-and-hold project bond based, which means that 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.
14. AS deals' WAM depends on the nature of the collateral: (*i*) consumer ABS include credit card receivables (mean WAM of 1 year), automobile loans (mean WAM of 8 years), and consumer loans (mean WAM of 13 years); (*ii*) commercial ABS include equipment leases (mean WAM of 5 years), small business loans (mean WAM of 6.5 years), student loans (mean WAM of 16 years), aircraft receivables (mean WAM of 17 years), corporate loans (mean WAM of 24 years); and (*iii*) MBS include commercial mortgages (mean WAM of 18 years).
15. 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. An appendix with the distribution of firms using PF versus CB or AS versus CB grouped per Z-score quartiles is available upon request.
16. Previous empirical studies commonly use the all-in-spread-drawn (AISD) as a proxy for the cost of capital in syndicated loans (Corielli *et al.* 2010; 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; Sorge and Gadanecz 2008).
17. Despite the adjustment, we are aware that the comparability between loans and bonds may have 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.
18. For example, the decision to go with a PF transaction, or with a CB issuance, should be based on the trade-off between the composite cost of capital of the PF, and the sponsor's, and the sponsor's overall cost of capital after the CB.
19. Results remain the same even when we use a subsample of deals closed by switchers in the same year.

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Table 1: 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 PF total value	Percent of total value per year	Number of deals	Total value [€ Million]	Percent of AS total value	Percent of total value per year	Number of deals	Total value [€ Million]	Percent of CB total value	Percent of total value per year
2000	47	13,376.94	2.85	7.18	26	16,109.37	7.00	8.64	244	156,880.63	4.50	84.18
2001	49	12,356.12	2.63	5.50	37	27,118.71	11.79	12.07	271	185,162.40	5.31	82.43
2002	32	10,744.80	2.29	7.42	22	21,089.67	9.17	14.56	206	113,013.46	3.24	78.02
2003	60	20,574.16	4.38	10.22	41	28,115.35	12.22	13.96	259	152,664.33	4.38	75.82
2004	65	12,236.84	2.60	9.74	24	18,182.06	7.90	14.47	206	95,210.05	2.73	75.79
2005	52	14,126.27	3.01	10.15	37	31,296.27	13.61	22.49	200	93,729.16	2.69	67.36
2006	47	15,432.14	3.29	7.53	43	34,692.69	15.08	16.92	237	154,866.44	4.44	75.55
2007	92	22,319.50	4.75	13.66	25	19,872.66	8.64	12.16	180	121,232.21	3.47	74.18
2008	241	46,620.75	9.92	24.03	7	5,534.19	2.41	2.85	242	141,856.42	4.07	73.12
2009	181	33,820.49	7.20	9.56	4	1,691.34	0.74	0.48	396	318,228.20	9.12	89.96
2010	210	45,338.73	9.65	20.03	3	1,650.00	0.72	0.73	351	179,405.89	5.14	79.24
2011	172	40,558.70	8.63	18.38	3	1,684.42	0.73	0.76	375	178,381.14	5.11	80.85
2012	136	27,840.36	5.93	7.76	8	4,931.22	2.14	1.38	620	325,778.11	9.34	90.86
2013	153	35,138.28	7.48	10.81	7	4,727.42	2.06	1.45	640	285,169.53	8.17	87.73
2014	143	30,976.22	6.59	8.96	12	6,534.58	2.84	1.89	670	308,250.74	8.83	89.15
2015	220	38,907.76	8.28	11.39	10	4,208.98	1.83	1.23	536	298,508.53	8.56	87.38
2016	231	49,395.20	10.51	11.42	4	2,584.61	1.12	0.60	513	380,695.74	10.91	87.99
Total	**2,131**	**469,763.24**	**100.00**	**-**	**313**	**230,023.54**	**100.00**	**-**	**6,146**	**3,489,032.97**	**100.00**	**-**

Table 1 describes the distribution of the full sample of deals by year. While columns 4, 8, and 12 report the percentage of the deal total value in that year to all the years, columns 5, 9, and 13 report the percentage of one type of funding to the all funding in each year. Data are for deals reported in DCM Analytics and Loan Analytics with deal amount available, closed by European nonfinancial 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 collateralized debt obligations, both funded and synthetic.

Figure 1: Distribution of the percent of total value per year

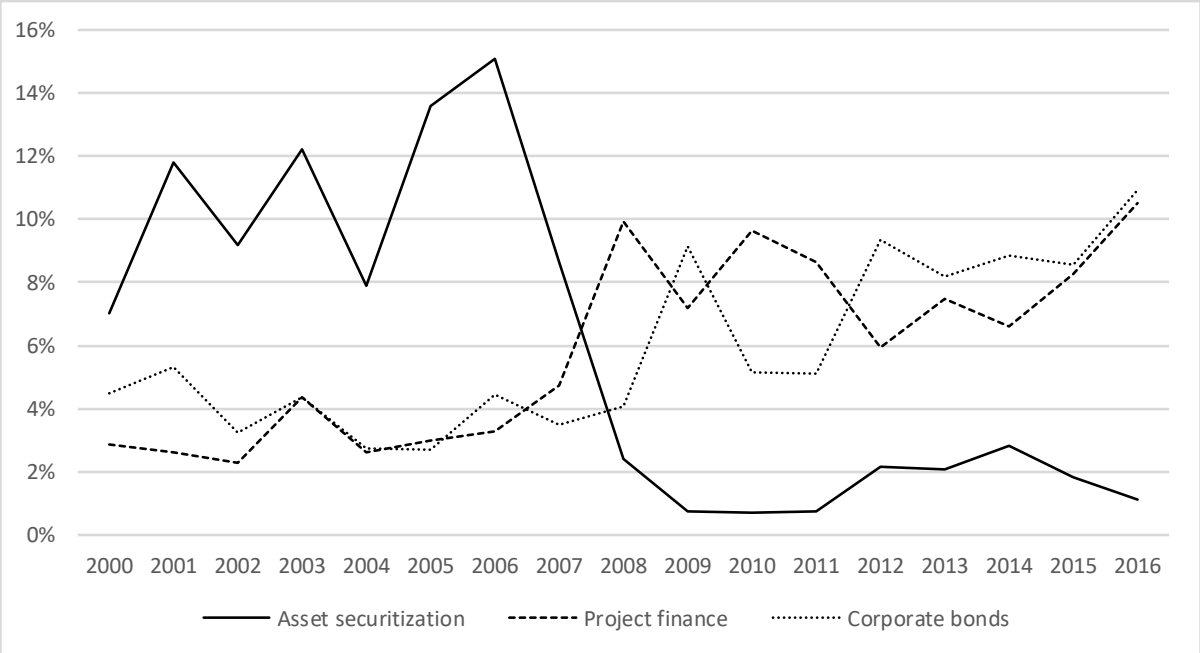


Figure 1 describes the distribution of the percent of total value per year; i.e., the percentage of the deal total value in that year to all the years, per deal type. Data are for deals reported in DCM Analytics and Loan Analytics with deal amount available, closed by European nonfinancial firms during 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 collateralized debt obligations, both funded and synthetic.

Table 2: 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 and Industrial			
Agriculture, Forestry and Fishing	0.75	0.16	0.64
Communications	0.94	1.55	18.05
Construction/Heavy Engineering	20.24	4.60	4.14
Manufacturing			
Chemicals, Plastic and Rubber	0.56	-	3.18
Food and Beverages	0.15	1.20	7.11
Machinery and Equipment	3.81	19.35	15.50
Steel, Aluminum and other Metals	0.75	-	1.61
Other	0.51	0.51	3.71
Mining and Natural Resources	0.67	-	1.20
Oil and Gas	6.01	0.67	8.62
Real Estate	3.39	18.93	3.32
Retail Trade	0.29	2.31	4.13
Services	7.16	13.81	7.94
Wholesale Trade	0.70	-	-
Utilities	36.30	5.99	15.34
Transportation	15.16	12.65	5.14
Public Administration/Government	2.21	18.27	0.02
Other	0.43	-	0.34
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 European nonfinancial 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 collateralized debt obligations, both funded and synthetic.

Table 3: Descriptive statistics for deals' contractual characteristics

Variable of interest		PF deals	AS deals	CB deals
Continuous variables:				
Weighted average spread (bps)[1]	Mean	222.28	63.57 [b]	235.63 [b]
	Median	180.60	45.73	165.40
	Number	557	185	4,312
Deal size (€ million)	Mean	220.44 [a]	734.90 [b]	567.69 [a,b]
	Median	99.00	469.94	350.00
	Number	2,131	313	6,146
Country rating [1-22 weak][2]	Mean	2.80 [a]	1.72 [b]	2.36 [a,b]
	Median	1	1	1
	Number	2,131	313	6,146
Weighted average maturity [years][3]	Mean	14.57 [a]	16.57 [b]	8.80 [a,b]
	Median	15	12	7
	Number	1,752	312	6,142
Number of tranches	Mean	2.04 [a]	2.80 [b]	1.33 [a,b]
	Median	2	2	1
	Number	2,131	313	6,146
Number of banks	Mean	5.05 [a]	2.70 [b]	4.48 [a,b]
	Median	4	2	3
	Number	2,124	313	6,145
Discrete variables:				
Deals to U.K. borrowers	% of total	20.46% [a]	40.26% [b]	23.77% [a,b]
	Nr. (D=1)	436	126	1,461
Deals to Construction/Heavy Engineering industry	% of total	15.07% [a]	5.43%	6.38% [a]
	Nr. (D=1)	321	17	392
Deals to Machinery and Equipment industry	% of total	2.73% [a]	18.53%	15.10% [a]
	Nr. (D=1)	58	58	928
Deals to Real Estate industry	% of total	4.29% [a]	23.00% [b]	6.98% [a,b]
	Nr. (D=1)	91	72	429
Deals to Utilities industry	% of total	48.75% [a]	7.03% [b]	14.06% [a,b]
	Nr. (D=1)	1,039	22	864
Deals to Transportation industry	% of total	7.40%	11.50% [b]	7.45% [b]
	Nr. (D=1)	158	36	458
Deals closed in the crisis period[4]	% of total	70.39%	17.25% [b]	67.96% [b]
	Nr. (D=1)	1,500	54	4,177

Table 3 presents contractual characteristics for the full sample of deals to firms in European countries. Each cell contains means, medians and number of observations for continuous variables' and percents and 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 4: Industrial distribution of deals issued by switchers

Borrower industry	Switchers in the sample period							
	Project Finance and Corporate Bond deals				Asset Securitization and Corporate Bond deals			
	Number of deals	Number of switchers	Amount [€ Million]	Percent of total value	Number of deals	Number of switchers	Amount [€ Million]	Percent of total value
Commercial and Industrial								
Agriculture, Forestry and Fishing	-	-	-	-	-	-	-	-
Communications	8	2	5,649.26	1.29	15	2	14,136.02	2.50
Construction/Heavy Engineering	123	23	47,572.84	10.88	26	6	14,865.32	2.63
Manufacturing								
Chemicals, Plastic and Rubber	15	5	9,890.90	2.26	-	-	-	-
Food and Beverages	-	-	-	-	1	1	607.68	0.11
Machinery and Equipment	41	9	47,732.17	10.92	457	14	307,643.90	54.34
Steel, Aluminum and other Metals	-	-	-	-	-	-	-	-
Other	2	1	100.11	0.02	3	1	2,050.00	0.36
Mining and Natural Resources	2	1	650.38	0.15	-	-	-	-
Oil and Gas	25	7	10,284.44	2.35	7	1	2,710.00	0.48
Real Estate	6	3	2,087.01	0.48	64	11	42,550.98	7.52
Retail Trade	3	2	686.17	0.16	40	4	27,519.13	4.86
Services	27	16	6,736.22	1.54	25	5	13,572.55	2.40
Wholesale Trade	2	1	447.90	0.10	-	-	-	-
Utilities	393	37	269,117.90	61.54	109	7	95,543.05	16.88
Transportation	61	14	35,347.81	8.08	69	9	44,927.88	7.94
Public Administration/Government	4	3	653.72	0.15	-	-	-	-
Other	4	2	340.00	0.08	-	-	-	-
Total	**716**	**126**	**437,296.83**	**100.00**	**816**	**61**	**566,126.51**	**100.00**

Table 4 describes the industrial distribution of the full sample of deals issued by switchers only. Data are for deals reported in DCM Analytics and Loan Analytics with deal amount available, closed by European nonfinancial 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 collateralized debt obligations, both funded and synthetic.

Table 5: Descriptive statistics for firms' characteristics

Variable of interest	[I] PF deals only (*N = 354*)	[II] CB deals only (*N = 3,465*)	[III] PF and CB deals (*N = 713*)	[IV] AS deals only (*N = 51*)	[V] CB deals only (*N = 3,250*)	[VI] AS and CB deals (*N = 816*)
Total assets (€ million)	16,016.40 [a,b]	49,532.30 [a,c]	64,001.01 [b,c]	144,259.20 [e]	37,759.75 [f]	104,872.50 [e,f]
	(3,439.69)	(19,671.00)	(30,226.00)	(7,550.11)	(16,325.50)	(88,277.00)
Debt to total assets	34.61%	34.56%	32.83%	42.50% [d]	33.37% [d,f]	40.12% [f]
	(33.69%)	(35.10%)	(32.09%)	(42.99%)	(33.32%)	(42.77%)
Short-term debt to total debt	23.17% [a,b]	27.33% [a,c]	22.73% [b,c]	28.35% [e]	25.11% [f]	34.48% [e,f]
	(16.35%)	(23.27%)	(19.20%)	(14.00%)	(20.79%)	(40.84%)
Fixed assets to total assets	35.98%	36.58% [c]	38.52% [c]	41.13%	36.35%	37.33%
	(31.66%)	(31.57%)	(42.61%)	(31.15%)	(32.46%)	(30.31%)
Market to book ratio	87.89% [b]	97.44% [c]	72.17% [b,c]	85.84%	100.35% [f]	81.13% [f]
	(75.61%)	(78.31%)	(69.71%)	(83.06%)	(80.44%)	(75.13%)
Return on assets	-0.38% [a]	5.46% [a,c]	3.89% [c]	3.48% [d]	5.78% [d,f]	3.72% [f]
	(3.94%)	(4.75%)	(3.76%)	(4.08%)	(5.20%)	(3.75%)

Table 5 presents nonfinancial firms' characteristics for the high-information sample of deals to firms in European countries. Each cell contains means and parenthetic medians. We test for similar distributions in nonfinancial 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. Categories [I] to [III] include subsamples of PF and CB deals closed by firms from industries where we have evidence of PF-and-CB-switchers. Similarly, categories [IV] to [VI] include subsamples of AS and CB deals closed by firms from industries where we have evidence of AS-and-CB-switchers (see Table 4). 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	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, PF deal = 2, CB deal = 3	
	Model [1]	Model [2]	Model [3]	Model [4]	Model [5]	Model [6]	Model [7]	Model [8]	Model [9]	
Choice of debt	PF deals only versus CB deals only	PF deals versus CB deals	PF deals versus CB deals	PF deals versus CB deals | Core industries	AS deals only versus CB deals only	AS deals versus CB deals	AS deals versus CB deals	AS deals versus CB deals | Core industries	AS deals	PF deals
Independent variables:										
Intercept	2.085 **	2.850 ***	-1.564	-3.321 *	-23.337 ***	-20.440 ***	-27.625 ***	-13.024 ***	-29.800	-19.918
	(0.036)	(0.001)	(0.314)	(0.072)	(0.000)	(0.000)	(0.000)	(0.000)	(0.993)	(0.995)
Log total assets	-0.459 ***	-0.381 ***	0.723 **	1.123 ***	0.012	-0.616 ***	0.919	1.490 **	1.760 ***	0.901 ***
	(0.001)	(0.000)	(0.017)	(0.005)	(0.974)	(0.008)	(0.204)	(0.025)	(0.006)	(0.000)
Log total assets * Log deal size			-0.533 ***	-0.809 ***			-0.607 **	-0.771 ***	-0.841 ***	-0.574 ***
			(0.000)	(0.000)			(0.019)	(0.003)	(0.001)	(0.000)
Debt to total assets	0.001	0.001	0.001	0.003	0.004	0.001	0.002	0.001	0.003	0.002
	(0.751)	(0.756)	(0.717)	(0.712)	(0.136)	(0.497)	(0.359)	(0.739)	(0.134)	(0.439)
Short-term debt to total debt	-0.006	-0.007	-0.006	-0.010 *	0.010	0.008	0.008	0.010	0.010 **	-0.005
	(0.275)	(0.112)	(0.194)	(0.045)	(0.242)	(0.246)	(0.227)	(0.196)	(0.033)	(0.117)
Fixed assets to total assets	-0.013 ***	-0.013 ***	-0.013 ***	-0.017 ***	-0.015 **	-0.012 *	-0.013 **	-0.024 ***	-0.006 *	-0.014 ***
	(0.005)	(0.001)	(0.001)	(0.001)	(0.043)	(0.058)	(0.042)	(0.000)	(0.094)	(0.000)
Market to book ratio	0.001	-0.001	0.001	0.001	-0.001	0.001 *	0.001 *	0.002 ***	0.001 **	0.001
	(0.437)	(0.491)	(0.566)	(0.538)	(0.829)	(0.056)	(0.052)	(0.002)	(0.027)	(0.624)
Return on assets	-0.039 *	-0.039 **	-0.039 *	-0.007	-0.080 ***	-0.042 ***	-0.043 ***	-0.058 ***	-0.051 ***	-0.043 ***
	(0.060)	(0.037)	(0.059)	(0.366)	(0.001)	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)
Log deal size	-1.216 ***	-1.536 ***	0.563 *	1.822 **	0.942 **	0.993 ***	3.650 ***	4.532 ***	4.736 ***	0.788 *
	(0.000)	(0.000)	(0.098)	(0.017)	(0.017)	(0.000)	(0.003)	(0.001)	(0.000)	(0.088)
Weighted average maturity	0.071 ***	0.064 ***	0.067 ***	0.056 ***	0.084 ***	0.064 ***	0.065 ***	0.064 ***	0.072 ***	0.068 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Country risk	-0.059	-0.043	-0.048	-0.041	-0.297 *	0.027	0.033	0.056	0.037	-0.039 *
	(0.262)	(0.328)	(0.255)	(0.331)	(0.087)	(0.686)	(0.617)	(0.381)	(0.505)	(0.073)
UK borrowers	-0.415	-0.177	-0.320	-0.355	1.455 ***	0.937 ***	0.933 ***	0.892 ***	0.866 ***	-0.437 ***
	(0.263)	(0.561)	(0.313)	(0.266)	(0.001)	(0.001)	(0.001)	(0.008)	(0.000)	(0.009)
Crisis	0.522	0.346	0.419	0.090	-3.143 ***	-2.379 ***	-2.331 ***	-2.180 ***	-2.201 ***	0.318
	(0.501)	(0.574)	(0.492)	(0.888)	(0.000)	(0.001)	(0.001)	(0.005)	(0.000)	(0.343)
Risk free rate	0.002	0.001	0.001	0.001	-0.003 *	-0.001	-0.001	-0.001	-0.001	0.001
	(0.453)	(0.509)	(0.511)	(0.879)	(0.090)	(0.643)	(0.663)	(0.788)	(0.307)	(0.447)
Volatility	0.029 **	0.017	0.017	0.015	0.034	0.029	0.030	0.033 *	0.023 *	0.020 ***
	(0.037)	(0.144)	(0.155)	(0.268)	(0.146)	(0.135)	(0.135)	(0.090)	(0.095)	(0.005)
EUSA5y-Libor3M	-0.002	-0.001	-0.002	-0.001	-0.007 **	0.001	0.001	0.001	0.001	-0.002 *
	(0.595)	(0.576)	(0.458)	(0.636)	(0.040)	(0.643)	(0.645)	(0.731)	(0.656)	(0.067)
Switcher		1.064 ***	1.087 ***	0.904 ***		2.642 ***	2.612 ***	2.281 ***	1.041 ***	0.987 ***
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.004)	(0.000)
Industry fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	3,819	4,532	4,532	2,250	3,301	4,117	4,117	2,250	4,933	
Correct predictions	92.32%	90.82%	90.73%	86.84%	98.19%	96.72%	96.84%	94.89%	88.75%	
Pseudo-R^2	0.331	0.337	0.345	0.310	0.419	0.422	0.426	0.372	0.347	

Table 6 presents results of logistic regressions, which predict nonfinancial firms' choice between debt types. In models [1] to [4], the dependent variable equals 1 when a firm closes a PF deal and 0 when it issues a CB deal. In models [5] to [8], the dependent variable equals 1 when a firm issues an AS deal and 0 when it issues a CB deal. In model [9] we use a multinomial specification, in which the discrete dependent variable takes the value 1 if the firm issues an AS deal, 2 if the firm closes a PF deal, and 3 if the firms issues a CB deal. Models [1] and [5] include those firms that closed only one type of deal during the period of analysis, while models [2], [3], [6], [7], and [9] include also switchers. Models [4] and [8] include only firms that belong to the core industries. In models [2] and [3], we link 888 firms' choice of debt for 4,532 PF and CB deals, while in models [6] and [7], we link 742 firms' choice of debt for 4,117 AS and CB deals. 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. 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 country. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 7: Determinants of firms' choice: credit risk, funding costs, and switchers

Dependent variable:	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	PF deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0	AS deal = 1, CB deal = 0
	Model [10]	Model [11]	Model [12]	Model [13]	Model [14]	Model [15]
Choice of debt	PF deals versus CB deals	PF deals versus CB deals | Switchers	PF deals versus CB deals | Switchers	AS deals versus CB deals	AS deals versus CB deals | Switchers	AS deals versus CB deals | Switchers
Independent variables:						
Intercept	2.627 (0.471)	-2.440 (0.606)	-3.289 (0.500)	-50.559 * (0.090)	-25.229 *** (0.000)	-24.113 ** (0.043)
Log total assets	1.211 (0.132)	1.587 (0.113)	1.886 * (0.066)	4.368 (0.401)	0.791 (0.436)	-2.432 ** (0.022)
Log total assets * Log deal size	-0.827 ** (0.015)	-0.816 * (0.075)	-0.956 ** (0.041)	-2.108 (0.226)	-0.907 ** (0.020)	0.152 (0.694)
Debt to total assets	0.013 * (0.100)	-0.006 (0.530)	-0.012 (0.315)	0.033 * (0.091)	-0.005 (0.653)	0.026 (0.187)
Short-term debt to total debt	0.005 (0.574)	-0.001 (0.870)	0.003 (0.798)	0.010 (0.746)	0.008 (0.511)	0.019 (0.167)
Fixed assets to total assets	-0.014 * (0.057)	-0.002 (0.674)	0.001 (0.931)	0.028 (0.359)	0.002 (0.816)	-0.011 (0.326)
Market to book ratio	0.001 (0.908)	-0.002 (0.811)	-0.005 (0.452)	0.002 ** (0.034)	0.002 *** (0.001)	-0.021 (0.726)
Return on assets	-0.057 *** (0.000)	-0.063 * (0.100)	-0.028 * (0.086)	-0.106 ** (0.035)	-0.086 * (0.089)	-0.013 * (0.051)
Log deal size	1.539 (0.237)	1.527 (0.443)	2.264 (0.263)	11.249 (0.205)	5.013 ** (0.012)	0.204 (0.918)
Weighted average maturity	0.069 *** (0.000)	0.047 *** (0.002)	0.045 *** (0.005)	0.120 ** (0.014)	0.045 ** (0.030)	0.051 ** (0.036)
Country risk	-0.081 (0.176)	-0.010 (0.864)	0.001 (0.998)	0.221 (0.171)	0.144 ** (0.030)	0.143 * (0.064)
UK borrowers	-0.849 ** (0.047)	0.168 (0.686)	0.021 (0.960)	2.875 *** (0.010)	0.705 ** (0.046)	1.191 ** (0.035)
Crisis	-0.370 (0.638)	-0.017 (0.981)	-0.618 (0.446)	0.894 (0.537)	-2.078 ** (0.027)	-2.065 * (0.088)
Risk free rate	0.001 (0.746)	-0.001 (0.838)	-0.002 (0.511)	0.005 (0.225)	0.001 (0.784)	0.001 (0.839)
Volatility	0.021 (0.171)	0.002 (0.906)	0.013 (0.470)	0.068 (0.178)	0.019 (0.414)	0.012 (0.706)
EUSA5y-Libor3M	-0.002 (0.530)	-0.003 (0.193)	-0.002 (0.459)	0.006 (0.275)	0.004 (0.166)	0.001 (0.746)
Switcher	0.892 *** (0.003)			4.093 *** (0.000)		
Log z-score	-3.123 *** (0.000)			0.340 (0.856)		
Weighted average spread	-0.001 (0.277)			-0.037 ** (0.040)		
EPS surprise			-2.292 (0.169)			10.819 * (0.068)
Industry fixed effects	yes	yes	yes	yes	yes	yes
Number of observations	1,997	664	580	2,221	814	678
Correct predictions	94.04%	79.97%	78.10%	99.01%	89.93%	92.48%
Pseudo-R^2	0.376	0.251	0.246	0.672	0.392	0.448

Table 7 presents results of logistic regressions which predict nonfinancial firms' choice between PF and CB deals (models [10] to [12]) and between AS and CB deals (models [13] to [15]). 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. 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. EPS surprise is the difference between the actual earnings per share for year *t* and the earliest consensus (median) forecast for year *t*, deflated by beginning of year *t* share price. 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 country. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 8: Regression analyses of the cost of funding and the debt financing choice

Dependent variable: Weighted average spread (bps)	Model [16] PF and CB deals	Model [17] PF and CB deals | Switchers	Model [18] PF and CB deals | Matched sample	Model [19] AS and CB deals	Model [20] AS and CB deals | Switchers	Model [21] AS and CB deals | Matched sample
Independent variables:						
Intercept	221.188 ***	-18.846	131.122	183.792 ***	298.505 **	275.144
	(0.001)	(0.841)	(0.207)	(0.000)	(0.021)	(0.224)
PF	-20.857	-25.773	6.106			
	(0.135)	(0.188)	(0.791)			
AS				-79.256 ***	-87.550 ***	-100.734 **
				(0.000)	(0.000)	(0.029)
Switcher	14.556			-3.174		
	(0.165)			(0.799)		
Log total assets	-69.307 ***	-10.510	-75.636 ***	-53.184 ***	-81.101 ***	32.861
	(0.000)	(0.520)	(0.004)	(0.000)	(0.000)	(0.270)
Debt to total assets	1.114 ***	3.311 ***	1.515 ***	1.525 ***	0.635	0.923 *
	(0.001)	(0.001)	(0.022)	(0.000)	(0.394)	(0.073)
Short-term debt to total debt	-0.107	0.555	0.422	0.249	-0.899	-1.438 *
	(0.660)	(0.399)	(0.426)	(0.250)	(0.152)	(0.056)
Fixed assets to total assets	-0.509 ***	-0.913 **	-1.249 ***	-0.173	0.240	-0.084
	(0.007)	(0.034)	(0.002)	(0.362)	(0.641)	(0.914)
Market to book ratio	-0.221	-0.799 ***	-0.100	-0.004	-0.008	0.189
	(0.162)	(0.004)	(0.408)	(0.889)	(0.653)	(0.311)
Return on assets	-1.665	-0.913	-1.515	-3.831 ***	-8.214 **	-4.814
	(0.199)	(0.633)	(0.293)	(0.000)	(0.022)	(0.296)
Log deal size	17.721 *	-3.772	43.455 **	-15.765	24.946 *	-59.588
	(0.096)	(0.861)	(0.047)	(0.137)	(0.095)	(0.095)
Weighted average maturity	2.523 ***	2.656 **	1.557	2.939 ***	1.903 **	2.419
	(0.002)	(0.019)	(0.384)	(0.000)	(0.038)	(0.133)
Number of tranches	-13.917 ***	1.470	-30.362 ***	-8.232 ***	-16.389 ***	0.705
	(0.000)	(0.814)	(0.000)	(0.007)	(0.002)	(0.948)
Number of banks	1.846 ***	2.007	-2.991	2.717 ***	1.475	3.303
	(0.074)	(0.254)	(0.129)	(0.005)	(0.400)	(0.301)
Country risk	10.432 ***	12.647 ***	10.218 *	9.532 ***	14.664 ***	18.906
	(0.001)	(0.000)	(0.064)	(0.000)	(0.007)	(0.141)
UK borrowers	20.483 *	7.389	17.219	3.656	-23.809	-122.477 **
	(0.089)	(0.799)	(0.501)	(0.736)	(0.424)	(0.013)
Crisis	158.116 ***	141.376 ***	191.738 ***	144.882 ***	162.821 ***	127.387
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.230)
Risk free rate	0.165 **	0.224 **	0.332 **	0.103 *	0.194 **	-0.194
	(0.021)	(0.030)	(0.017)	(0.078)	(0.019)	(0.245)
Volatility	4.051 ***	3.154 ***	4.946 ***	3.622 ***	5.630 ***	-0.393
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.823)
EUSA5y-Libor3M	0.101	-0.067	0.177	0.074	0.202	-0.596 **
	(0.179)	(0.594)	(0.263)	(0.288)	(0.127)	(0.041)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,484	382	308	2,951	569	90
Adjusted R^2	0.369	0.446	0.405	0.350	0.484	0.562

Table 8 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. 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 country. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Appendix A

Top 10 SF and CB deals' switchers in the 2000-2016 period

Panel A: Top 10 PF and CB deals' switchers in the 2000-2016 period

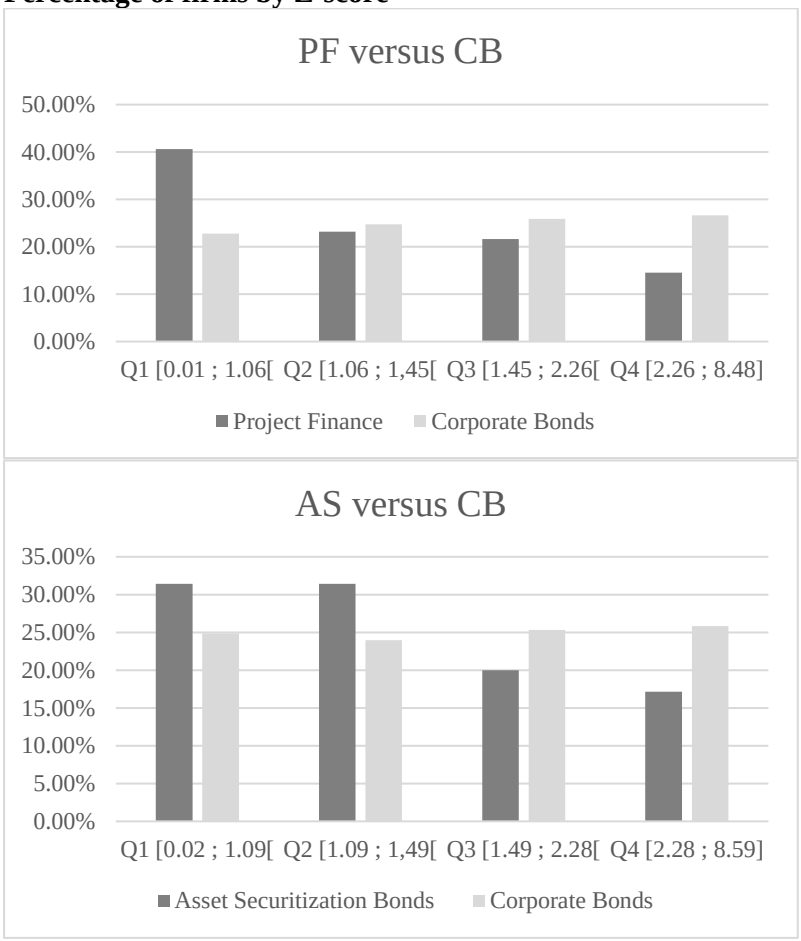
Sponsor/issuer	Industry	Number of switches	Number of PF & CB deals in the same year	Number of PF deals	PF deals amount [€ Million]	Number of CB deals	CB deals amount [€ Million]
Électricité de France, S.A.	Utilities	44	65	22	4,734.20	63	72,262.40
Engie, S.A.	Utilities	38	18	19	4,085.35	30	25,207.80
Enel S.p.A.	Utilities	22	9	11	3,499.31	18	32,788.90
Ferrovial, S.A.	Construction/Heavy Engineering & Transportation	16	12	8	3,047.70	23	16,105.80
Vinci, S.A.	Construction/Heavy Engineering & Transportation	16	4	8	1,910.44	11	5,261.50
Bouygues, SA	Construction/Heavy Engineering & Services	14	10	7	3,100.20	12	8,861.10
Obrascon Huarte Lain, S.A.	Construction/Heavy Engineering & Transportation	12	6	6	1,295.65	6	2,850.00
Gas Natural SDG, S.A.	Oil and Gas & Utilities	10	5	6	2,391.88	5	1,400.00
Iberdrola, S.A.	Utilities	8	8	4	3,200.00	20	8,791.90
Abengoa, S.A.	Construction/Heavy Engineering & Utilities	8	2	4	1,259.20	7	2,253.80

Panel B: Top 10 AS and CB deals' switchers in the 2000-2016 period

Originator/issuer	Industry	Number of switches	Number of AS and CB deals in the same year	Number of AS deals	AS deals amount [€ Million]	Number of CB deals	CB deals amount [€ Million]
Groupe PSA, S.A.	Machinery and Equipment	16	8	8	8,168.70	16	9,840.00
Renault, S.A.	Machinery and Equipment	12	1	6	6,335.50	19	6,282.50
Bayerische Motoren Werke AG	Machinery and Equipment	10	31	5	3,251.90	105	62,605.60
Électricité de France, S.A.	Utilities	10	16	5	2,137.50	63	72,262.40
Volkswagen AG	Machinery and Equipment	10	13	5	4,473.00	40	30,665.30
Vonovia SE	Real Estate	10	5	5	9,272.00	10	9,806.30
J. Sainsbury PLC	Retail Trade	10	5	6	3,821.70	5	2,282.20
Anglian Water Group PLC	Utilities	10	2	5	4,585.00	12	3,473.90
EDP - Energias de Portugal, S.A.	Utilities	8	11	4	2,303.60	13	8,356.80
CNH Industrial NV	Machinery and Equipment	8	3	4	1,461.70	6	2,886.00

Appendix B

Percentage of firms by Z-score



This figure reports the percentage of firms per Z-score in our high-information sample. All firms are grouped per quartiles. The Z-score is for the fiscal year ending just prior to deal closing.

Appendix C

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 / -	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 / +	+
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 (January 1, 2000 – December 31, 2016) 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.	-	I
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.	+	+
Weighted average maturity	The weighted average between the tranche maturity, in years, and its weight in the deal size.	+	+
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	+
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 difference 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.