Structured Finance and the Boundaries of the Firm: The case of Project Finance

Paulo P. Alves
Professor of Accounting and Finance
Universidade Católica Portuguesa, Católica Porto Business School and CEGE
International Centre for Research in Accounting, Lancaster University Management School
palves@ucp.pt

João M. Pinto*
Professor of Finance
Universidade Católica Portuguesa, Católica Porto Business School and CEGE
jpinto@ucp.pt

November 17, 2021

Abstract

We examine the factors that influence public firms' choice between project finance and internally organized investment projects. Using a large sample of syndicated deals closed between 2000 and 2020 in conjunction with Datastream data, we find that economies of scale, agency costs of debt, and information asymmetry arguments affect the choice of on- *versus* off-balance-sheet funding. As project finance deals have higher borrowing costs than comparable corporate financing deals, we show that other firm-level countervailing benefits play a key role in the sponsoring firms' choice: borrowers choose project over corporate financing when they are relatively larger, less profitable and creditworthy, and seek long-term financing; and switchers resorting to project finance tend to be more levered and have larger growth opportunity sets.

Keywords: project financing, corporate financing, syndicated loans, debt financing choice.

JEL classification: F34; G01; G21; G24; G32

Please address all correspondence to:
João M. Pinto
Católica Porto Business School
Rua Diogo Botelho, 1327
4169-005 PORTO
Tel: +351 226 196 260
e-mail: *jpinto@ucp.pt*

* The authors would like to thank Philipp Brutscher, Hyungjin Cho, Steven Dennis, Antonio De Socio, Miguel Ferreira, Vidhan Goyal, William Megginson, João Santos, Anthony Saunders, Amit Seru, and Toni Whited. We would also like to extend our thanks to participants in the 2016 Corporate Finance Alternatives in Europe Workshop at the European Investment Bank, Católica Porto Business School 9th Accounting and Finance Conference, the FMA 2017 Annual European Conference in Lisbon, the European Financial Management Association 2017 Annual Meeting in Athens, the FMA 2017 Annual Conference in Boston, the 2018 International Finance and Banking Annual Conference in Porto, and the 2021 Portuguese Finance Network International Conference in Braga for helpful comments on earlier drafts. The authors are responsible for all remaining errors and omissions. Financial support from Fundação para a Ciência e Tecnologia (through project UIDB/00731/2020) is gratefully acknowledged.

Structured Finance and the Boundaries of the Firm: The case of Project Finance

Abstract

We examine the factors that influence public firms' choice between project finance and internally organized investment projects. Using a large sample of syndicated deals closed between 2000 and 2020 in conjunction with Datastream data, we find that economies of scale, agency costs of debt, and information asymmetry arguments affect the choice of on- *versus* off-balance-sheet funding. As project finance deals have higher borrowing costs than comparable corporate financing deals, we show that other firm-level countervailing benefits play a key role in the sponsoring firms' choice: borrowers choose project over corporate financing when they are relatively larger, less profitable and creditworthy, and seek long-term financing; and switchers resorting to project finance tend to be more levered and have larger growth opportunity sets.

Keywords: project financing, corporate financing, syndicated loans, debt financing choice.

JEL classification: F34; G01; G21; G24; G32

November 17, 2021

1. Introduction

Corporate financial structure is not confined to the choice between debt and equity financing, rather, it encompasses a more complex set of contractual features. Within the class of debt securities, corporates typically make another choice, mainly public *versus* private debt. Furthermore, firms also have the choice to borrow on-balance-sheet or off-balance-sheet through the creation of a special purpose entity or vehicle (SPE/SPV).[1] Mergers, spinoffs and strategic alliances are classic examples of such decisions (Robinson 2008). More recently, structured finance transactions, such as project finance (PF) and asset securitization, have increased significantly(Leland 2007). In this paper, we contribute to the literature on the boundaries of the firm by examining what determines which projects occur inside firms and which projects occur via SPEs, by exploring the rise in popularity of PF.[2]

Extant structured finance literature addresses the roles of funding costs, financial flexibility, risk management, agency costs, information asymmetries, interest tax shields, and financial synergies in determining the use of off-balance-sheet debt arrangements.[3] Empirically, few papers investigate the determinants of structured finance transactions usage by nonfinancial firms. Mills and Newberry (2005) find that U.S. firms with lower debt ratings and higher leverage are more likely to use R&D limited partnerships, structured leases, and asset securitization. They also provide evidence suggesting that firms with more free cash-flow to total asset ratios use more structured financing arrangements. Lemmon *et al.* (2014) show that U.S. securitization users are larger and more concentrated in the middle of the credit quality distribution, and that securitization minimizes firms' financing costs. Similarly, Pinto and Santos (2019) show that European firms use asset-backed securities to reduce the cost of bond financing. Regarding PF, Hainz and Kleimeier (2012) find that political risk and creditor rights correlate positively with the use of PF. Likewise, Subramanian and Tung (2016) point out that PF is more likely

[1] Prior research on firms' debt financing choice discusses, amongst other topics, the choice between bank and bond financing (Diamond 1991b, Chemmanur and Fulghieri 1994, Houston and James 1996, Krishnaswami *et al.* 1999, Cantillo and Wright 2000, Denis and Mihov 2003, Morellec *et al.* 2015). Albeit that this stream of literature makes predictions about the relationship between debt source preferences and firm characteristics, it has devoted little attention to the firm's choice between on- *versus* off-balance-sheet financing.

[2] For further discussion on PF, see Brealey *et al.* (1996), Kleimeier and Megginson (2000), Esty (2003, 2004a, 2004b), Fabozzi *et al.* (2006), Gatti (2008), and references therein.

[3] Structured finance typically refers to off-balance-sheet contractual arrangements designed to fund a specified asset, or a segregated pool of assets, by setting up bankruptcy-remote corporations or other SPEs to implement the transaction. Structured finance techniques include asset securitization, PF, structured leases, and leveraged corporate acquisition (Fabozzi *et al.* 2006, Leland 2007, Pinto and Santos 2019).

in countries with weaker laws and weaker creditor rights. However, none of these analyzed how sponsoring firms' characteristics impact the choice of PF *vis-à-vis* corporate financing (CF). If PF debt is more expensive than comparable CF debt (Klein *et al.* 1996, Pinto and Santos 2019), why do firms use PF? What are the sponsoring firms' characteristics that determine the choice between PF and CF?

In this paper, we aim to contribute to the extant literature by focusing the analysis at the firm level, examining the factors that drive sponsors' decision to use PF *vis-à-vis* CF, as well as the economic consequences for firms that sponsor a PF transaction. It is widely accepted that PF is most commonly used for capital-intensive facilities and utilities, in riskier than average countries, as a way of mitigating political, sovereign and expropriation risks. It is important, however, to understand why firms facing similar operational and sovereign risks still choose between PF and CF. This is even more interesting if sponsors face higher borrowing costs when funding a specific project through an SPE rather than on-balance-sheet. In particular, we want to examine what factors drive firms, like the French firm Électricité de France, S.A., which raised $23.97 billion of syndicated loan financing in the 2000-2020 period, using both PF ($8.55 billion) and on-balance-sheet CF ($15.42 billion), switching 22 times between the two deal types.[4] PF is an economically significant growing financial market segment, but still largely understudied. Esty and Sesia (2007) report that a record $328 billion in PF funding was globally arranged in 2006, a 51.2% increase from the $217 billion reported for 2001. According to Refinitiv (2020), $310.35 billion were arranged worldwide in 2019. In fact, PF deals did not contract during the 2008 financial crisis when compared to other forms of syndicated credit. In comparison with other financing mechanisms, the PF market was smaller than both the corporate bond and the securitization markets in 2019. Nonetheless, the amount invested in PF was still larger than the amount raised through IPOs or venture capital funds.

Prior theoretical literature has essentially addressed the rationale for sponsors using PF as opposed to using CF. Extant studies hypothesize that PF contracting is designed aiming at the reduction of asymmetric information problems (Shah and Thakor 1987, Kensinger and Martin 1988), mitigating costly agency conflicts (Berkovitch and Kim 1990, John and John 1991, Flannery *et al.* 1993, Esty

[4] For an analysis of the firms that closed both PF and CF deals (herein switchers), see Appendix A.

2003, 2004b, An and Cheung 2010), maintaining the sponsors' financial flexibility (Nevitt and Fabozzi 2001, Gatti 2008), increasing interest tax shields (Shah and Thakor 1987, Kensinger and Martin 1988, John and John 1991, Chemmanur and John 1996); and improving risk management (Brealey *et al.* 1996, Esty 2003). From the point of view of the sponsoring firm, there is an important economic consequence of a PF transaction: it allows sponsoring firms to invest in a large project without a substantial impact on their balance sheet or creditworthiness. As argued by Shah and Thakor (1987), John and John (1991), and Gatti (2008), when segregating a financing operation such as a PF, sponsoring firms' credit rating is protected and their key financial ratios are preserved, therefore maintaining their cost of borrowing. However, a PF transaction can also increase the risk for existing on-balance-sheet creditors. As the PF transaction is structured via the transfer of a subset of firms' assets into a bankruptcy-remote corporation, the sponsors' creditors have no access to the new project's cash flows. This effect may increase the default risk of existing creditors if sponsors choose to implement through PF, from the existing investment opportunities' portfolio, those projects with the highest NPVs.

We examine the importance of these effects, as well as which factors may explain the choice between PF and CF in a comprehensive sample of syndicated deals closed between January 1, 2000 and December 31, 2020. Our sample contains information about 1,071 PF deals (worth $378.8 billion) and 20,602 CF deals (worth $13,618.9 billion) extended to borrowers/projects located in OECD countries, for which we have information on sponsoring/borrowing firms' accounting and market characteristics.

We begin our analysis by examining the impact of PF transactions on the sponsors' cost of borrowing. One strand of the literature argues that, as PF can reduce market frictions, namely agency and asymmetric information problems, and improves risk management, it can reduce the sponsor's cost of funding (Brealey et al. 1996, Esty 2003, 2004a, Corielli et al. 2010). In contrast to CF, PF contractual arrangements provide a framework for asset collateralization and restrictive covenant stipulation, lowering asset riskiness and decreasing expected default costs. In addition, potential lower default renegotiation costs, idiosyncratic risk diversification, and more efficient risk management may also reduce borrowing costs (John and John 1991, Esty and Kane 2010). On the other hand, empirical literature presents evidence that PF debt is more expensive than traditional CF alternatives. PF deals carry relatively higher transaction costs (e.g., contractual design and structuring fees), they have a high

level of financial leverage, and are used to implement large-scale and relatively more risky and operationally more complex projects (Fabozzi *et al.* 2006, Esty and Kane 2010, Gatti *et al.* 2013). Klein *et al.* (1996) and Pinto and Santos (2019) provide evidence that PF debt has higher spreads than comparable corporate debt. We do not find evidence that corroborates extant PF theoretical literature: our results indicate that PF deals' *weighted average spread* (WAS) is higher than that of comparable CF deals - results are robust when using endogenous switching regression models, alternative proxies for borrowing costs and when a propensity score matched sample of CF deals is used -, and changes in PF users' credit risk do not differ significantly, in the years after the closing of a PF deal, when compared with matched non-users. Thus, PF seems to increase sponsors' overall cost of borrowing.

Next, we examine changes in firm outcomes around the utilization of a PF deal by using a difference-in-difference approach. We find that, after the closing of a PF transaction, sponsors experience higher leverage than the control group. In addition, PF firms' growth opportunities are significantly lower than non-users in the year after the closing of a PF deal. Our results also show that PF users' profitability does not differ significantly from that of non-users. This result, coupled with non-significant differences in sponsoring firms' creditworthiness *vis-à-vis* matched non-users in the year and one and two years after the closing of a PF deal, is in line with the usage of PF to maintain key financial ratios and minimize distress costs.

Considering that PF is more expensive than CF, other firm-level countervailing benefits other than borrowing costs should play a key role in the sponsors' decision of choosing PF *vis-à-vis* CF. Therefore, lastly, we examine the firms' characteristics that determine the choice of PF over CF deals. First, our results support the relevance of PF in reducing deadweight costs from asymmetric information problems. We find that PF enables borrowers to obtain funding with much longer maturities, which is in line with security design literature (Flannery 1986, Diamond 1991a, 1993). Second, our findings only support the debt overhang motivation of using PF for projects in the utilities industry implemented by switchers and for a matched sample of CF deals. Contrary to Subramanian and Tung's (2016) findings in an industry-level analysis, we do not find evidence of firms with higher agency costs of free cash flow selecting PF to finance large-scale projects. Third, larger firms and those that raise higher amounts of debt prefer PF to CF, likely reflecting large fixed costs when implementing a PF transaction. Fourth,

more creditworthy firms have little incentive to engage in PF, as these firms already have access to high-grade credit markets and have little reason to further minimize expected bankruptcy costs. Finally, results also show that PF sponsors are less profitable and want to maintain financial flexibility.

The paper extends the literature in several ways. Firstly, we extend existing literature on the economic rationales for off-balance-sheet activities by nonfinancial firms. By showing that organizational structure can be used to manage risk and help raise capital improves the knowledge on what determines the boundaries of the firm, a question from industrial organization economics that remains unanswered. Secondly, we believe our study is the first to examine the sponsoring firms' characteristics that determine the choice between PF and CF - contrary to previous studies, we focus on the sponsor rather than the project level. While many theoretical studies yield hypotheses about what firm factors might drive the choice of PF transactions, these hypotheses have not been tested empirically. Thirdly, we add to the literature showing that bankruptcy costs, asymmetric information costs, and issuance costs are important frictions that affect capital structure decisions. Fourthly, to address potential self-selection concerns with regard to the endogeneity of the firms' decision to use PF, we focus on switching firms, we build a matched sample of CF users using a propensity score matching approach, and we use endogenous switching regression models. To the best of our knowledge, these methodologies have not been employed in this context in the past. Finally, we examine changes in firms' key financial ratios and credit quality following the closing of a PF, controlling for a group of matched non-users.

Our paper is organized as follows. In section 2, we discuss the theoretical and empirical background of PF. Section 3 describes the data and variables used. In section 4, we analyze if PF deals allow sponsors to reduce borrowing costs *vis-à-vis* comparable CF deals and examine the economic consequences of PF lending. Section 5 examines sponsoring firms' characteristics that determine the choice between PF and CF and Section 6 presents our conclusions.

2. Conceptual background and related literature

Extant literature points out that structuring a PF transaction is costlier than traditional CF alternatives due, at least partly, to[5] (*i*) legal, financial, insurance, accounting and fiscal, engineering and environmental advisory fees (Esty and Kane 2010); (*ii*) structuring costs involved in a fairly extensive, detailed, highly restrictive, and complex nexus of contracts (Fabozzi *et al.* 2006, Gatti *et al.* 2013); (*iii*) higher credit and equity risk, in part due to greater leverage (Esty 2004); and (*iv*) operational complexity (An and Cheung 2010). Klein *et al.* (1996) find that PF debt is 50-400 bps more expensive than corporate debt because creditors cannot rely on the cross-collateralized cash flows and assets the way they can with corporate debt. Similarly, Pinto and Santos (2019) find evidence of higher credit spreads for European PF *vis-à-vis* corporate bond deals. If PF deals have higher borrowing costs compared to financing a similar asset as part of a corporate balance-sheet, then it is not immediately clear why a manager might choose PF. For it to be rational, PF must entail significant countervailing benefits to offset the incremental transaction and borrowing costs, and time. Yet these benefits are not well understood, nor have they been accurately analyzed in the literature (Zingales 2000).

2.1. Structured finance and the boundaries of the firm

Extant literature presents economies of scope and scale, market power, incomplete contracting, property rights, and agency costs as important determinants of the boundaries of the firm (Holmstrom and Roberts 1998). Among others, Grossman and Hart (1986) and Hart and Moore (1990) point out that project ownership should be allocated in order to provide incentives for marginal effort more efficiently. John and John (1991) show that the flexibility of allocation of debt for a new project across assets-in-place and the new SPE lead to value gains from reduced agency costs and increased tax shields. While Flannery *et al.* (1993) consider operational synergies related to underinvestment, Chemmanur and John (1996) use managerial ability and control issues to explain PF and the scope of the firm. More recently, Leland (2007) develops a theoretical model which analyzes the purely financial benefits of separation *versus* merger. The author finds that financial synergies are negative in the case of activities financed jointly when they have quite different risks of default or default costs, which provides a rationale for

[5] Esty (2003) estimates transaction costs to be around 5-10% of the project's total cost and that the time needed to set up a project company ranges from six months to eighteen months.

structured finance techniques. Financial separation of activities as in asset securitization and PF allows each activity to have its optimal capital structure, allowing for greater leverage in the SPE.[6] As pointed out by Esty (2003), structured finance is a form of risk management and raising capital that differs from traditional strategies because it involves a change in the scope of the firm.

Structured finance is related to the design of financial arrangements based on the use of contracting tools and mechanisms to meet different requirements and needs of borrowers and investors, helping to efficiently (re)finance a specified pool of assets beyond the scope of on-balance sheet financing (Fabozzi *et al.* 2006, Leland 2007). Transactions are usually designed - in terms of tranching, credit enhancement mechanisms, covenants, warrantees, corporate structures, contracts, and trusts - to achieve segregation of those assets or cash flows from the originator or sponsor of the transaction. Extant literature suggests several economic motivations for originating a financing transaction under a structured model (Fabozzi *et al.* 2006, Leland 2007, Pinto and Santos 2019). First, it is invoked if established traditional borrowing methods are unavailable or depleted. The second advantage refers to maintaining the sponsors' financial flexibility by creating vehicle companies designated to take on the financing, helping sponsors to protect their own credit standing and future access to financial markets, and by improving or maintaining financial/regulatory ratios. In addition, it contributes to mitigating the deadweight costs associated with information asymmetries and agency costs via namely structuring and tranching. Finally, it also allows sponsoring firms to unlock the value of the assets.

2.2. The financial economics of project finance

PF is a form of financing based on a standalone entity created by the sponsors, with highly levered capital structures and concentrated equity and debt ownership. To understand the reason for using PF, a thorough understanding is needed of why the combination of a firm plus a project might be worth more when financed separately with nonrecourse debt than when they are financed jointly with corporate funds. Extant literature presents four primary reasons for sponsoring firms using PF (John and John 1991, Nevitt and Fabozzi 2001, Esty 2003, 2004a,b).

[6] In a related paper, Robinson (2008) shows that strategic alliances arise when certain actions are not enforceable in internal capital markets, and when the project in question is riskier than the firm's primary activity.

Firstly, PF can be used to mitigate costly agency conflicts inside project companies and among capital providers - *agency cost motivation*. In Jensen's (1986) line of thought, large tangible assets with high free cash flows, are prone to costly agency conflicts. Through the creation of a legally independent company, PF provides an opportunity to create a new asset-specific governance system to address the conflicts between management and ownership (Finnerty 1996, Kensinger and Martin 1988). In addition, PF can also reduce agency conflicts between ownership and third parties, by deterring opportunistic behavior by suppliers of critical inputs or expropriation by host governments (Esty 2003). Myers (1977), John and John (1991) and Flannery *et al.* (1993) show that SPEs use joint ownership and high leverage to reduce costly agency conflicts among participants. According to Subramanian and Tung (2016), PF structure enhances the verifiability of cash flows by the lender through contractual constraints on cash flows and private enforcement of these contracts. In PF, there is a role for contracting as a disciplinary device to curtail the potential inefficient effects of agency problems and, therefore, we expect that firms with higher agency costs of free cash flow select PF to finance large-scale projects.

Secondly, this type of transaction allows companies with little spare debt capacity to avoid the opportunity cost of underinvestment in positive NPV projects - *debt overhang motivation* (Myers 1977). Brealey *et al.* (1996) and Esty (1999) argue that PF helps to reduce the debt-overhang problem by assigning project returns to new investors rather than existing capital providers. According to John and John (1991), Flannery *et al.* (1993), and Fabozzi *et al.* (2006), the off-balance-sheet treatment of the funding raised by the SPE is crucial for sponsors since it only has a limited impact on sponsors' creditworthiness and does not impact sponsors' ability to access additional financing in the future.[7] Several works analyze the advantages and disadvantages of PF in the context of a firm's capital structure. Among them, Shah and Thakor (1987) argue that 'project financing enhances the values of some of these projects by permitting higher optimal leverage than with conventional financing.' This allows, as presented by John and John (1991), the value of interest tax shields to be increased when compared with corporate debt financing. While Chemmanur and John (1996) show that SPEs' leverage

[7] The opportunity cost of underinvestment due to leverage is essentially negligible in PF, as SPEs have few valuable options available. In addition, as the cash flow waterfall restricts investment decisions while concentrated ownership ensures close monitoring, the opportunities for risk shifting are almost non-existent.

depends on the level of control benefits of the project *vis-à-vis* the sponsoring firm, Nevitt and Fabozzi (2001) present the maintenance of financial flexibility as a key benefit for firms when segregating a financing operation such as a PF. Separation into two different legal entities, whereby the sponsor manages the assets-in-place, and a new SPE runs the project's assets, may be beneficial in terms of the potential reduction in the overall business risk of the combination of the sponsor plus the vehicle company (Pinto and Santos 2019). In addition, segregating the financing structure and the limited liability of each of those entities may allow their combination to increase leverage and to retain its potential associated benefits, namely in terms of cost of capital, default risk and debt capacity (Chemmanur and John 1996; Leland 2007; Hann et al. 2013). Therefore, sponsors with high agency costs of debt should be more likely to engage in PF *vis- à-vis* CF.

Thirdly, PF improves risk management - *risk management motivation*. Underinvestment problems due to distress costs and/or managerial risk aversion (Stulz 1984) can be reduced through PF. According to Esty (2003), risk sharing with other sponsors and debtholders reduces incremental distress costs. Corielli *et al.* (2010) argue that PF can reduce the amount of assets subject to costs related to financial distress and bankruptcy by separating some assets from sponsors' balance sheets. For projects with high expected distress costs, PF can dramatically reduce the sponsoring firm's potential risk of contamination by using separately incorporated SPEs financed via nonrecourse debt. In addition, Leland (2007) asserts that the limited or nonrecourse debt provides a sponsoring firm with the valuable option of walking away from the project when cash flows are negative, and that the value of such an option is higher for high-risk projects. Under this framework, we might expect that the risk management motivation might be more relevant for sponsors with higher expected costs of distress (either from higher probability of distress or higher costs given distress); i.e., for those firms in which a large loss on a CF asset could have a greater impact on their creditworthiness, dragging them into financial distress. Therefore, PF is more valuable in reducing the possibility of risk contamination for firms with relatively higher incremental distress costs due to investment in large and risky assets. On the project side, PF arrangements are typically structured as extensive and detailed networks of contracts to transfer a variety of project risks to the parties that are best able to appraise and manage them (Brealey *et al.* 1996, Corielli *et al.* 2010). By virtue of credit enhancement and other structuring and contractual

devices, PF can mitigate project risks. In contrast with CF, PF contractual arrangements provide a framework for idiosyncratic risk diversification and more efficient risk management (Esty and Kane 2010).

Finally, PF can also help to reduce underinvestment due to asymmetric information problems - *asymmetric information motivation*. According to Myers and Majluf (1984), firms with high deadweight costs of asymmetric information are more prone to underinvestment, which occurs when the value of both assets-in-place and investment opportunities are uncertain. In such a situation, the authors recommend separation as a possible solution to maintaining sufficient financial slack to avoid underinvestment. Shah and Thakor (1987) present information search cost reduction as the main benefit of PF, while Kensinger and Martin (1988) argue that this type of off-balance-sheet financing technique reduces signaling costs. Following this line of reasoning, Esty (1999, 2003) and Corielli *et al.* (2010) point out that PF can help to reduce this problem due to the separation of projects from the sponsoring firm(s) facilitates' initial credit decisions and it is relatively easy to convey information that would be more difficult in a CF framework. Similarly, John and John (1991) and Gatti *et al.* (2013) argue that PF arrangements are structured as extensive and detailed networks of contracts among the parties involved, which are typically disclosed to lenders, significantly lowering their levels of informational asymmetries. Therefore, borrowers with higher levels of asymmetric information may prefer PF to CF.

2.3. Prior empirical evidence

There are two empirical studies closely related to ours. Hainz and Kleimeier (2012), using a sample of non-U.S. borrowers, find that political risk and creditor rights correlate positively with the use of PF and that higher political risk increases the probability of development banks participating in the bank syndicate. Subramanian and Tung (2016) point out that PF is more likely in countries with weaker laws and weaker creditor rights and that changes in investor protection have greater effects in industries with higher agency costs of free cash flow *vis-à-vis* tangible-asset-intensive industries. Authors control for industry-level factors and find a positive relationship between the likelihood of PF and the industry's free cash flow, asset tangibility, leverage and growth opportunities. Researchers have also examined individual PF arrangements (Esty 2003, Dailami and Hauswald 2007, Bonetti *et al.* 2010), geographic and industrial distribution of PF loans (Kleimeier and Megginson 2000, Esty and

Megginson 2003), determinants of PF loan spreads (Corielli *et al.* 2010, Gatti *et al.* 2013), how project's risk level and different types of contract arrangements affect project company capital structure (Corielli *et al.* 2010, Byoun *et al.* 2013, Müllner 2017), the composition and concentration level of bank syndicates (Esty and Megginson 2003, Qian and Strahan 2007, Hainz and Kleimeier 2012, Gatti *et al.* 2013); and the impact of PF on economic growth (Kleimeier and Versteeg 2010). That said, there has been virtually no empirical research that has investigated how sponsors' characteristics - a micro-level analysis - affect the choice of PF and the economic consequences of such transactions for sponsoring firms. As pointed out by Esty (2003), research on determinants of sponsoring firms to use PF is needed. According to the author, 'the fact that the motivations for using project finance relate to the asset (agency cost), the sponsoring firm (debt overhang), and an interaction between the two (risk management), helps explain why previous attempts to create a single, universal reason for using project finance have failed.' Only when considering all these factors simultaneously will it be possible to understand why such a wide range of firms (e.g., low rated firms trying to avoid the debt overhang problem on the one hand; high-rated firms trying to minimize distress costs, on the other hand) use PF for a variety of projects in a number of countries.

3. Data and variable definition

3.1. Sample selection

Considering that PF deals are funded with small amounts of private equity contributions and much larger amounts of nonrecourse syndicated loans, the corporate syndicated loan market is a rich field for analyzing the choice between PF and CF. Therefore, our sample consists of individual loans extracted from Dealscan database and covers the 2000-2020 period. Information is available on the micro characteristics of the loans (e.g., deal and loan size, maturity, currency, pricing, rating, type of interest rate) and of the borrowers (e.g., name, nationality, industry sector). As the unit of observation in our study is the syndicated deal, multiple tranches from the same transaction appear as separate observations in our database; e.g., PF loans typically consist of several tranches funding the same project company. Therefore, to perform a deal-level analysis, we use data at the deal level and, when necessary, we aggregate tranche-level data (e.g., spread and maturity). Although the database extracted from Dealscan contains detailed historical information about syndicated loans to firms domiciled in any

country, we exclude deals with: (*i*) no loan (facility) amount or deal amount available; (*ii*) deal status not closed or completed; and (*iii*) loans that are amendments to existing loans. Following Carey and Nini's (2007) approach, to reduce the problem of unmeasured credit quality correlated with nationality, firms' choice determinants are examined based on a sample including only deals closed in OECD countries.

As we aim to examine firms' choice between PF and full-recourse CF debt in the financing of long-term capital-intensive investment projects, we carefully identify categories of CF deals such that for each deal in our sample, the counterfactual choice between PF and CF deals is plausible. We differentiate between PF and CF deals based on the loan purpose.[8] We thus retain only loans with the primary purpose of 'project finance' for PF deals, and we compare this with loans whose primary purposes are 'equipment purchase', 'aircraft finance', 'ship finance', 'lease finance', 'real estate', 'telecom build-out', 'capital expenditure' or 'corporate purposes'.[9] Since PF involves investment in large projects (Esty 2004b), the CF deals selected must be of sufficient size. That is, they must be larger than the smallest PF deal amount. We also require that each deal must include at least one term loan and we excluded hybrid project financing. Finally, we verified with Thomson Reuters that our PF sample refers to deals made by a vehicle company, that the primary purpose of each loan is the same for each specific deal, and that the sum of all loans in the package equals the deal amount.

In order to examine firm-level determinants of on- *versus* off-balance-sheet financing choice, we collect firm-specific accounting and market data from Datastream. Dealscan does not provide an identification code, so we hand-matched the sponsor with the highest equity ownership in the separate PF firm with Datastream by using the sponsor's name. For CF deals, data from Datastream is merged with deal information from Dealscan by hand-matching borrowers' names. This method allows the deals to be matched with the ultimate party responsible for the financing choice decision. We link the

[8] Dealscan database classifies loans in accordance with their primary purpose (e.g., 'project finance', 'takeover', 'lease finance', 'working capital', 'capital expenditures', or 'general corporate purposes') and includes information on loan type (e.g., term loan and credit line). An appendix with the distribution of syndicated deals by year and loan primary purpose is available upon request.

[9] Hainz and Kleimeier (2012) and Subramanian and Tung (2009) use a similar approach. While Hainz and Kleimeier's (2012) sample includes a broader range of loan purpose categories, Subramanian and Tung (2009) include only 'capital expenditure' and 'corporate purpose' loans. We follow the approach of Hainz and Kleimeier (2012) and conduct robustness checks using a narrow sample (see 5.4), as in Subramanian and Tung (2009).

choice between PF and CF to firm characteristics reported around the deal closing date (the closest fiscal year end in the period [–365 days to +30 days]). A close analysis of our deals' data indicates the existence of some extreme values for the time to maturity, deal amount, and firm size variables. We have trimmed these variables at the top and bottom 1% percentiles.

To avoid selection bias problems, we select from the sample of firms with accounting and market data available after the hand-matching process, those deals arranged in industries where PF and CF deals are frequently used. It is not useful to compare a firm in a specific industry using general corporate purpose deals but not PF deals to finance its activities. The same applies to financial firms, which are lenders in PF transactions and not sponsors, when compared with nonfinancial firms. Table 1 presents information for a subsample of deals implemented by switchers, firms that closed two types of deals - PF and CF - during the sample period, 365 days and 730 days within the closing date. Results show that there are no switchers in three industries: (*i*) food and beverages; (*ii*) financial institutions; (*iii*) and other. For these industries, we assume that the firms' access to PF and CF syndicated markets may be dissimilar, thus, we excluded deals closed in these industries from our sample. Table 1 also shows that PF and CF deals implemented by switchers are concentrated in six industries: utilities, construction/heavy engineering, oil and gas, real estate, transportation, and machinery and equipment, which account for 82.75% of the total debt raised between 2000 and 2020 (88.43% and 88.82% for switchers within 365 days and 730 days, respectively). We refer to these industries as our core industries, and we carried out additional analyses using only these industries (see 5.4). For an analysis of the top 10 switchers (firms that conduct both PF and CF deals) in the 2000-2020 period, see Appendix A.

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

After merging firms involved in the deals with Datastream and applying the screens mentioned, we are able to analyze 1,071 PF deals (2,181 tranches), worth $378.8 billion, and 20,602 CF deals (29,087 tranches), worth $13,618.9 billion, closed by 5,683 publicly traded firms, between 2000 and 2020.

Panel A of Table 2 presents the industrial distribution of our sample of syndicated deals, whereas Panel B details the deal allocation to borrowers in a particular region. Panels A and B reveal

striking differences between PF and CF lending. Panel A shows that PF lending is concentrated in four key industries; i.e., utilities (52.45%), construction/heavy engineering (17.65%), transportation (7.97%), and oil and gas (5.93%) account for 84% of all PF lending by volume. CF deals reveal a far less concentrated industrial pattern, with borrowers in services (16.58%), machinery and equipment (14.85%) and utilities (10.60%) industries receiving the higher percentages. Panel B also shows clear differences between the regions that attract PF lending and those where CF is directed. Perhaps the most remarkable difference is how infrequently PF deals are extended to U.S. projects *vis-à-vis* CF. In our sample, whereas U.S. corporations arrange 69.28% of CF deals, U.S. SPEs account for a mere 27.79% of PF lending. On the contrary, in Europe, the bulk of syndicated lending is extended to European borrowers through PF, with Spain, the U.K., France, Portugal, Germany, and Italy accounting for 51.90% of all PF lending by volume.

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

3.2. Methodology and variables

The main objective of our analysis is to examine firms' choice between PF and CF, namely to investigate how firms' characteristics, deals' contractual features, and macroeconomic variables affect the choice between off-balance-sheet financing, via PF, and on-balance-sheet financing, via CF. For this analysis, we utilize a logistic regression model. Our dependent variable, choice of debt, is a binary variable equal to 1 if the firm closes a PF deal and 0 if it, instead, closes a CF 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 refer to deal *i* at time *t*. We show evidence that PF choice is not independent within industries and years. Thus, coefficients were estimated based on heteroskedasticity-consistent standard errors clustered by year and firm. A discussion of the variables used follows. Table 3 provides the detailed definitions and sources for all the variables used in the paper.

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

3.2.1. Asymmetric information

Based on debt choice literature (Denis and Mihov 2003, Altunbas *et al.* 2010), we use firm size to capture incentive problems related to information asymmetries. *Log total assets* refer to the natural logarithm of firm total assets, and we expect it to negatively influence the probability of a sponsoring firm choosing a PF deal rather than a CF deal. As the natural logarithm of firm size is also used as a proxy for economies of scale in relation to issuance costs (Esho *et al.* 2001, Denis and Mihov 2003), we use other measures of asymmetric information. Firstly, we use *former lender*, a dummy variable equal to 1 if one of the arranging banks in the syndicate was a firm's former lender, and 0 otherwise. We consider a former lender if there is an already established relationship with a lender (or a syndicate of lenders), which may be associated with a decrease in information asymmetries when compared with a deal arranged by a new lender, due to increased monitoring and information accumulation over the term of the firm-bank relationship (Boot 2000, Degryse *et al.* 2009). We thus expect a negative relationship between the *former lender* variable and the probability of observing a PF deal. Secondly, the deal's weighted average maturity (*WAM*), computed as the weighted average between the loan maturity, in years, and its weight in the deal size, is used to capture informational costs associated with liquidity risk induced by debt refinancing. We expect a positive relationship between WAM and the probability of a firm choosing a PF deal. Finally, as in Gomes and Phillips (2012) and Brown *et al.* (2009), we use analysts' earnings forecasts. Ajinkya *et al.* (1991) and Lang and Lundholm (1996) point out that analysts' forecast accuracy decreases when firms make more informative disclosures about future earnings. We compute the *EPS surprise* variable as the difference between the actual earnings per share for year *t* and the earliest consensus (median) forecast for year *t*, deflated by the beginning of year *t* share price. We expect a positive relationship between higher earnings surprise and the choice of PF.

3.2.2. Agency costs

To investigate if firms with high agency costs of debt and with more growth opportunities are more likely to choose PF rather than CF, we use *debt to total assets* and *market-to-book* ratios. As in Esho *et al.* (2001) and Denis and Mihov (2003), *debt to total assets* refers to the ratio of total debt to total assets, which is a proxy for borrowers' level of financial constraint. The *market-to-book* ratio proxies for a public firm's growth potential and is computed as the sum of book value of liabilities and

market value of equity divided by the book value of assets (Denis and Mihov 2003, Altunbas *et al.* 2010). As identified by Smith and Watts (1992) and Barclay and Smith (1995), expected future growth increases a firm's market-to-book ratio. We thus expect that firms with higher deadweight costs resulting from the debt overhang problem, those with higher leverage and investor expectations about future cash flow potential, will prefer PF *vis-à-vis* CF.

In addition, we use the *free cash flow to assets* ratio to examine if firms with higher agency costs of free cash flow increase the likelihood of PF *vis-à-vis* CF.

3.2.3. Issuance costs

As in previous studies on firms' debt choices (Esho *et al.* 2001, Denis and Mihov 2003), we use the natural logarithm of firm size and deal size as proxies for economies of scale in relation to issuance costs. Considering that structuring a PF transaction is costlier than traditional CF alternatives, we expect to see a positive relationship between both *Log total assets* and *Log deal size* and the probability of observing a PF *versus* a CF deal.

3.2.4. Cost of funding and financial distress

We use the deal's WAS, computed as the sum of the product between loan spread and its loan size to deal size ratio, as a proxy of the deal's overall cost of borrowing. As in Esho *et al.* (2001) and Denis and Mihov (2003), we use Altman's (1993) *Z-score* as a proxy for a firms' credit risk. In computing the *WAS,* we use the all-in-spread-drawn (AISD) - requiring information on the spread for all the tranches - and drop loans without a Libor or Euribor spread. Loans differ in the currency in which they are denominated, raising the possibility that expectations about exchange rate movements might drive differences in loan spreads across markets. We address this problem by converting contract spreads into dollar-equivalent spreads using, as proposed by Carey and Nini (2007), forward exchange rates as of the loan contract signing date. We have also trimmed the *WAS* at the top and bottom 1% percentiles.

As the WAS captures only the cost of borrowing attributable to the funding coming from corporate syndicated loans, this variable does reflect the firm's aggregate cost of borrowing. We thus use an adjusted WAS as an alternative measure, which is the combination of the WAS for PF deals and the ratio of interest expense to average total debt for firms that choose CF. In addition, for syndicated

loans, the AISD does not represent the full economic cost of credit, as additional fees, such as commitment fees and up-front fees, are typically charged[10].

We also examine the impact of the firm's profitability and asset tangibility on the choice. We use the *return on assets* ratio as our surrogate for profitability, computed as net income before preferred dividends minus preferred dividend requirement, divided by total assets. We expect *return on assets* to relate negatively to the probability of PF lending. Asset tangibility is measured by the *fixed assets to total assets* ratio, computed as the ratio of net property, plant, and equipment to total assets. Considering that firms in capital-intensive industries most commonly use PF, we expect asset tangibility to have a positive impact on the likelihood of firms choosing PF *versus* CF.

3.2.5. Control variables

We also control for macroeconomic factors such as the term structure of interest rates, *5YrTB-3mTB,* calculated as the difference between the 5-year and 3-month T-bill rate at the deal closing date, and market *volatility*, measured by the Chicago Board Options Exchange Volatility Index. As we are dealing with cross-country data, we include the S&P's *country rating* to control for sovereign risk. Consistent with the risk management motivation for using project finance, we expect country risk to have a positive impact on PF usage (Stulz 1996). In addition, to control for unobserved country characteristics and their country-specific variations over time, we use country fixed effects.

As we expect that borrowers belonging to capital-intensive industries would prefer PF rather than CF, and we need to control for government participation in public-private partnerships, we use dummy variables to control for industry factors. To control for the supply side conditions of the syndicated loan market, we include the *number of banks* in the bank syndicate, *bank reputation*, computed according to the yearly global mandated arrangers league tables provided by Thomson Reuters, and dummy controls for *domestic lead banks* (*versus* foreign lead banks), which equals 1 if the bank's syndicate lead bank's (or at least one of the lead banks) nationality is the same as the deal

[10] As an alternative to the AISD, Berg *et al.* (2015) propose the 'total-cost-of-borrowing' (TCB), which accounts for fees and spreads. As the information provided by Dealscan regarding up-front fees is scant and imposes a significant reduction in our sample - from 8,241 to 370 observations when using the weighted average TCB -, we use the WAS in our baseline models and perform robustness checks using the TCB (see section 4.1).

country, and for *financial crisis* and *sovereign debt crisis*. A final dummy variable - *switcher* - identifies firms that employ multiple debt types (PF deals and CF deals) within our sample period.

3.3. Characteristics of new PF and CF syndicated deals

Table 4 provides descriptive statistics for two samples of PF and CF deals: Panel A presents the descriptive statistics for the full sample, comprising all syndicated deals closed during the 2000-2020 period, extended to firms with accounting and market data available; while Panel B presents descriptive statistics for a sub-sample of PF deals and a matched sample of CF deals with available information on WAS. When assessing WAS differences across deal categories, we find that the average WAS for PF and CF deals does not differ significantly. However, when focusing on adjusted WAS, Table 4 shows that the cost of borrowing in a PF deal is significantly higher than on-balance-sheet funding via CF. Our results show that PF deals are extended, on average, to projects in riskier countries than CF syndicated deals: PF deals average country rating is significantly higher than that of CF deals. The mean (median) CF deal size of $714.13 million ($400.00 million) is significantly more than the PF mean (median) deal size of $527.56 million ($274.88 million) in Panel A, which does not corroborate PF literature hypothesis that sponsoring firms choose PF over CF to obtain economies of scale in relation to issuance costs.

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

While PF transactions (2.26) extended to OECD countries include, on average, a larger number of tranches than CF deals (1.41), an average PF deal (7.18) includes a lower number of banks than CF deals (8.22). Prestigious arranging banks participate more in CF deals than in PF deals. The average bank reputation in PF loans (15.58) is significantly lower than the average for CF deals (5.92) - note that ranks range from 1 (best) to 25 (worst). PF deals have a WAM of 11.09 years, which is significantly higher than that of CF deals' subsample (4.25 years). In contrast to traditional syndicated loans in which repayment capacity stems from the issuer's ability to generate sufficient cash flows, PF debt repayment prospects depend primarily on the SPE assets and cash flows, and on guarantees provided by third parties. Combining this finding with the fact that CF is more often extended as a repeated transaction through an already established relationship with a lender than PF - while a former lender arranges

19.11% of PF deals, 66.02% of CF deals have at least one former lender in the bank syndicate -, our results seem to support the argument that PF is used to mitigate asymmetric information problems.

A significantly larger fraction of PF deals is closed in the financial crisis period (10.21%) compared to the sample of CF deals (4.19%), while the opposite is true for sovereign debt crisis. Interestingly, the table shows that a significantly higher fraction of CF lending is arranged by domestic lead banks (82.91% *versus* 51.83% for PF deals). Finally, the only result that differs between the full sample and the matched sample is related to the currency risk: while in the full sample, CF deals (6.49%) are less likely to bear currency risk than PF deals (10.21%), in the matched sample this variable does not differ significantly between PF and CF deals.

4. Cost of borrowing and the consequences of project finance usage

PF can reduce sponsoring firms' cost of borrowing when compared with traditional on-balance-sheet financing if the following two conditions hold. First, if the PF deals' cost of borrowing is lower than that of the sponsors', as a result of the improved credit rating that can be obtained by the SPE (Esty 2003). Second, if the off-balance-sheet treatment of the funding raised by the SPE allows sponsors to maintain their creditworthiness by preserving the core financial ratios and, thus, does not impact sponsors' ability to access additional financing in the future (John and John 1991, Chemmanur and John 1996). In this section, we compare PF deals' cost of borrowing with those of comparable CF deals, and examine changes in firm outcomes following the use of a PF deal. To do that, we focus on the sponsors' cost of borrowing and annual changes in the firms' accounting and market ratios.

4.1. Does project finance lower the cost of borrowing?

4.1.1. Base model results

In this section, we use the samples presented in Table 4. We use the deal adjusted WAS – the WAS for PF deals and the borrower's ratio of interest expense to average total debt for CF deals – as a proxy of the deal's overall cost of debt funding and consider deals with sponsors' (PF) and borrowers' (CF) accounting and market characteristics. If PF transactions facilitate lower borrowing costs, the adjusted WAS for CF deals should exceed that of PF deals. We test this hypothesis by using the model

specified in equation (2). The dependent variable is the adjusted WAS and we create a dummy variable set equal to one if the deal is a PF deal (*PF*), and estimate a regression of the following form:

$$adjusted\ WAS_{i,t} = \alpha_0 + \beta \times PF_{i,t} + \gamma \times Corporate\ characteristics_{i,t-1} + \varphi \times Contractual\ characteristics_{i,t} + \theta \times Macro\ factors_t + \varepsilon_{i,t} \quad (2)$$

where the subscripts refer to deal *i* at time *t*. We employ OLS regression techniques and coefficients are estimated based on heteroskedasticity-consistent standard errors clustered by year and firm.

Columns 1 and 2 of Table 5 report the results of estimating equation (2) for the full sample. The results suggest that the adjusted WAS for PF deals is significantly higher than for CF deals. In the previous models, the PF dummy may suffer from endogeneity, due to the lack of plausibly exogenous variation in the choice between PF and CF. We may be comparing the borrowing cost of a PF made by a sponsor that has high credit risk and only has access to PF, with a firm that has access to both PF and CF and chooses CF. In other words, credit risk measured by Z-score might be driving both sponsoring firms' borrowing cost and the choice of PF *versus* CF, which in turn makes inference difficult due to biased estimates (Roberts and Whited 2013). To account for this problem, we start by re-estimating these models considering a subsample of switchers - model [3], estimated for a subsample of 205 and 1,051 PF and CF deals, respectively. Results show, again, that the cost of borrowing is significantly higher for project *versus* corporate financing; i.e., switchers face a 207.69 bps higher cost of borrowing in an average PF deal when compared with their on-balance-sheet aggregate cost of borrowing

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

In addition, as suggested by Casu *et al.* (2013) and Roberts and Whited (2013), to address self-selection concerns with regard to the endogeneity of the decision to use PF, we re-estimated our models for a matched sample. That is, we need to build a control group from the non-PF users whose performance trajectory lies as close as possible to that of the PF users. To create a matched sample, we employ a propensity score matching (PSM) approach (firm-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical firm in the same year (*t*-1). The propensity score was created using the following firms' characteristics: size, leverage, asset tangibility, growth opportunities, profitability, and credit risk. Results presented in column 4 of Table 5 show that PF adjusted WAS is

227.66 bps higher than that of matched CF deals. Finally, we test the robustness of our results by considering the TCB as an alternative to the AISD. Untabulated results show that using the weighted average TCB does not yield different results.

4.1.2. Cost of borrowing and the choice between PF and CF

As the choice between PF and CF deals may be endogenous, namely because borrowing costs and choice may be jointly decided, we re-estimate models [2] to [4] in Table 5 using an endogenous switching regression model (Lokshin and Sajaia 2004) to study the pricing, taking into consideration the potential self-selection by firms between closing PF *versus* CF deals. We conduct a full information maximum likelihood (FIML) method on the adjusted WAS samples simultaneously with a probit selection equation, where the choice between PF and CF is a function of contractual and firm characteristics, and macroeconomic factors. The empirical model is specified as follows:

$$adjusted\ WAS\ PF_{i,t} = \alpha_0 + \beta\ Corporate\ characteristics_{i,t-1} + \gamma\ Contractual\ characteristics_{i,t} + \varphi\ Macro\ factors_t + \varepsilon_{i,t} \quad (3)$$

$$adjusted\ WAS\ CF_{i,t} = \alpha_0 + \beta\ Corporate\ characteristics_{i,t-1} + \gamma\ Contractual\ characteristics_{i,t} + \varphi\ Macro\ factors_t + \varepsilon_{i,t} \quad (4)$$

$$I^*_{i,t} = \delta_0(adjusted\ WAS\ PF_{i,t} - adjusted\ WAS\ CF_{i,t}) + \gamma\ Contractual\ characteristics_{i,t} + \varphi\ Macro\ factors_t + \omega\ Corporate\ characteristics_{i,t-1} + u_{i,t} \quad (5)$$

where the third equation models deal selection: if $I_i^* > 0$, then firm *i* chooses a PF, otherwise, it issues CF. We adjust for heteroscedasticity and estimate standard errors clustered by year and firm. Considering the Wald test statistics of independent equations, we reject the hypothesis of equations being independent for all models in Table 6, meaning that the choice between PF and CF influences the pricing of both syndicated deal types. To examine if borrowers face a higher cost of borrowing when funding a project through PF *vis-à-vis* CF, we computed the average treatment effect (ATE) for adjusted WAS of PF *versus* CF. We used models [5] to [7] and obtained the correct standard errors (as we account for the errors in the selection equation) for these ATEs through bootstrapping. We show, as presented in Table 6, that PF deals are, on average, associated with 180.28 bps higher adjusted WAS than CF deals for the full sample. Similarly, as the ATE is 175.19 bps, with a 1% significance level, switchers face higher adjusted WAS when they use PF rather than CF. Finally, model [7] shows that PF users face a higher cost of borrowing (ATE of 180.03 bps) than matched non-users. Our results are

corroborated when analyzing FCC. As can be seen in Appendix C, the WAS is higher for the PF deal closed in 2007 than for CF deals closed in 2006 and 2007. So far, our results do not corroborate the PF literature hypothesis that the funding cost of PF is lower than the funding cost of traditional corporate syndicated debt. However, to have a complete analysis on this subject, we also need to analyze the evolution of the sponsors' overall cost of capital after the PF deal. Considering that the cost of capital evolution depends on the evolution of the sponsors' credit risk, in the next section, we also examine changes in Z-scores around the closing of PF transactions.

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

Although a thorough analysis of the determinants of debt financing choice between project and corporate financing is conducted in section 5, Table 6 presents a set of interesting preliminary results. Results from models [5] and [6] show that borrowers choose PF over CF when they are relatively larger, less profitable, have higher asset tangibility, and seek long-term financing. Findings also document that borrowers resorting to CF tend to have larger growth opportunity sets. Contrary to what we expected, the impact of deal size on the likelihood of observing a PF deal is significant and negative. Finally, firms with lower Z-scores prefer PF over CF.

4.2. The changes in firm characteristics around the implementation of a PF transaction

In this section, we use a difference-in-difference approach to compare PF *versus* CF effects for firms. We thus compare changes among PF users against a control group of non-users, using the PSM approach presented in the previous section and require that for both samples there is available information for firms' characteristics between the year prior to the PF closing (t-1) and two years after (t+2). For each PF sponsor, we take the mean of the corresponding matching firms as our control and examine the differences between the firm and the industry mean. Panel A of Table 7 shows unadjusted means for the PF sponsors only, and Panel B shows the differences between users and matched non-users. The first column in Table 7 reports the levels of variables as of one year before the closing of a PF deal. Panel B shows that our matching firms provide a good control group; the differences generally are not significantly different from zero.

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

We begin by analyzing the impact of PF on the leverage of sponsors. One year prior to the PF deal closing, sponsors have an average leverage ratio of 38.9%, and it increases one and two years after the PF deal closing. Between *t*-1 and *t*+2, the debt to total assets ratio increases by 2.6 percentage points. This change is 4.6 percentage points larger than the control group, reflecting the increase in leverage level of PF users. Table 7 also shows that PF firms' asset tangibility and growth opportunities do not change significantly in the period *t*-1 through to *t*+2. In addition, while the changes in differences for fixed assets to total assets do not differ significantly between users and matched non-users in the year and one and two years after the closing of a PF deal, in *t*+1 PF sponsors' market to book ratio is significantly lower *vis-à-vis* that of CF users.

Next, we analyze the impact of PF lending on the profitability of the firm. One year prior to the PF closing, the return on assets ratio does not differ significantly for PF users than for non-users, and there is a significant decrease in PF sponsors' profitability between *t*-1 and *t*+1 and *t*+2, from 4.7% to 3.9% and 3.1%, respectively. However, this decrease does not differ between PF sponsors and matched CF users. We also track the credit risk of PF sponsors. One year prior to the PF deal closing, sponsoring firms have an average Z-score of 1.85 and it decreases about 0.66 between *t*-1 and *t*+2. However, the change in the difference of Z-score between PF users and the control group is not different from zero, reflecting that there is no decrease in default probability between the two samples. We thus corroborate extant PF literature that advocates that these financing structures allow sponsoring firms to invest in a large project and, at the same time, obtain protection of credit rating and preserve their key financial ratios (Shah and Thakor 1987, John and John 1991, Gatti 2008). Coupling these results with those obtained in the previous section, we can conclude that, in fact, PF transactions do not reduce borrowing costs in relation to on-balance-sheet corporate financing. Considering that the adjusted WAS is higher in PF than CF deals and that subsequent to PF, sponsors' creditworthiness does not improve as it, in fact, does not differ from that of non-users, we do not find evidence corroborating extant PF literature that PF transactions reduce the sponsors' overall cost of borrowing (Brealey *et al.* 1996, Esty 2003, 2004a, Corielli *et al.* 2010). On the contrary, we show that PF deals have higher borrowing costs than comparable CF deals. Our results can be explained by the fact that CF obtained from multiple debt types would potentially be associated with a decrease in agency and asymmetric information problems due to

increased monitoring through multiple lenders. Our results can also be explained by the fact that PF deals are complex transactions, with relatively higher transaction costs and credit risk than CF (An and Cheung 2010, Esty and Kane 2010).

If PF debt is more expensive than comparable CF debt, it becomes important to understand what the firm-level characteristics are that determine the choice between PF and CF, controlling for macroeconomic and contractual factors. This analysis is performed in the next section.

5. The borrower's choice between project financing and corporate financing

This section presents univariate and multivariate analyses examining how public firms' characteristics and contractual variables influence the choice between PF and CF deals, while controlling for macroeconomic factors. Our sample comprises deals that are often divided into smaller loans. As in previous sections, our descriptive and econometric analyses are based on the deals. Furthermore, in Tables 9, 10 and 11, we report coefficients, rather than odds ratios (exponential coefficients), because our main interest is in the direction of the effects, rather than their magnitude.

5.1. Univariate analysis

Table 8 reports characteristics of OECD public firms that were sponsors in a PF syndicated deal or borrowers in a CF deal for two samples: (*i*) a full sample, including all firms that closed syndicated deals (PF and/or CF deals) during the 2000-2020 period – Panel A; and (*ii*) a sub-sample of sponsoring firms that use PF and a matched sample of firms that borrow through comparable CF deals. To create a matched sample of firms that use CF, we employ a PSM approach (deal-level PSM), by creating a 1 to 1 matching algorithm that captures the most identical deal in the same year and industry, using the following characteristics: deal size and WAM. This allows us to examine what is correlated at firm level with the choice between PF and CF based on a comparable sample of deals. We also subdivide these firms into three categories according to their borrowing record within our sample period. The PF and CF deals' subsample is categorized as firms that close: (I) only PF deals; (II) only CF deals; and (III) both PF and CF deals.

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

Panel A of Table 8 shows that, on average, firms that used only PF deals are typically larger - with an average (median) size of $52.38 billion ($5.18 billion), firms in category [I] have borrowing

needs and capacity to use PF syndicated loans extensively -, have higher default risk and lower profitability, than those accessing CF markets, exclusively. These results are in accordance with our expectations . PF is in great demand for sponsors with relatively higher credit risk when it does not substantially affect their balance sheet and, consequently, their access to additional financing in the future, and allows the key financial ratios to be maintained. While financial leverage, fixed assets to total assets ratio and EPS surprise do not differ at the 5% significance levels for the two subsets of firms, firms that used only CF deals have a higher market to book and free cash flow to total assets ratios than firms that used only PF. Similar results are presented in Panel B, with one exception: the market to book ratio does not differ significantly between firms in categories [I] and [II].

For the full sample, firms utilizing both markets are larger than those reliant on PF or CF only. They have relatively higher financial constraints, asset tangibility and market-to-book ratios than firms in categories [I] and [II] do. Firms that used PF and CF simultaneously have higher profitability when compared with firms that issued PF only, but a lower return on asset ratios than those belonging to category [II]. Analysts' forecast accuracy is significantly higher for firms that use both debt types than for those that use CF deals only. While both firms that use PF exclusively and switchers have higher default risk than that of firms that close exclusively CF, the z-score does not differ significantly between firms in categories [I] and [III]. Similar results are presented in Panel B for the matched sample, with the exception of asset tangibility, which does not differ significantly between firms belonging to category [III] *versus* those belonging to categories [I] or [II]. These results show that highly levered firms in capital-intensive industries with higher growth potential, use both project and corporate financing to raise funds to implement their investment projects. Thus, so far, our results are in line with the argument that PF transactions allow sponsors to mitigate debt overhang problems, working as a funding source diversification mechanism, and improving profitability ratios - the off-balance-sheet treatment of the funding raised by the SPV is crucial for sponsors since it only has limited impact on sponsors' performance. Univariate analyses also corroborate the risk management motivation for sponsoring firms using PF. We only find evidence supporting the hypothesis that firms with higher information asymmetry prefer PF for switchers and considering the *EPS surprise* measure. Finally, as

larger firms are more likely to raise funds through PF than CF, our results are, at this stage, in line with the argument of sponsors using PF to benefit from economies of scale in relation to the issuance costs.

5.2. Multivariate analysis

Table 9 reports the results of the logistic regression (1) to predict firms' choices of debt between PF and CF deals. Estimations were developed following a stepwise approach, focusing firstly, on all the firms that closed only one type of debt, either PF or CF deals (category [I] and category [II] firms, in Table 8) - model [8]. Subsequently, the same estimation method was extended to also include firms that used both instruments during the period of study, the switchers - models [9] and [10]. Finally, given the fact that in models [8] to [10] PF choices are 5% of the sample by number, which represents skewed choices made by firms, we examine the choice process for switchers only - model [11], to guarantee that our results are unbiased and that firms can in fact choose between PF and CF.[11]

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

Results reported in all models of Table 9 show that firms with potential asymmetric information problems, relatively smaller ones, prefer corporate financing. However, as expected, the dummy variable *former lender* negatively affects the probability of observing a PF deal. A lender that has an established relationship with a firm, which reduces asymmetric information problems, increases the probability of a new investment project to be funded on-balance-sheet through CF. Moreover, our findings document that coefficients of the WAM variable are significant and positive, which support the security design literature (Flannery 1986, Diamond 1991a, 1993): borrowers seeking to minimize informational costs associated with liquidity risk induced by debt refinancing will choose PF rather than CF. PF arrangements are structured as extensive and detailed networks of contracts, enhancing the predictability of expected cash flow streams and, consequently, allowing SPVs to raise funding with longer maturities (John and John 1991, Gatti *et al.* 2013).

[11] In unreported estimations, we examine whether results presented in Table 9 are robust by considering firm fixed effects to address possible time invariant firm-level issues. As results remain robust in these models and we re-estimate our models for switchers only, we present results including industry and country fixed effects only. We also re-estimate our models by using year times industry and country times industry fixed effects, and results are qualitatively the same. Results are available from the authors if required.

Deal size negatively affects the probability of observing a PF deal in models [8] and [9]. Considering that firm size can also test the economies of scale in relation to the issuance costs argument, in models [10] to [13], we add the interaction between firm size and deal size to further examine the impact of these variables on the choice process. The coefficients of the three variables, log total assets, log deal size, and log total assets * log deal size are statistically significant, and results show that firm size positively affects the likelihood of observing a PF transaction, but this effect reduces as deal size increases. This means that for larger investment projects, 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 PF to CF. That is, the implementation of considerably larger transactions through PF is more likely for relatively smaller firms. Results also show a significant positive impact of deal size in the choice of PF and that this effect reduces as firm size increases; i.e., while smaller firms choose PF for relatively large amounts of debt to economize on scale, larger firms may prefer financing investment projects on-balance-sheet through CF deals because they will have little impact and thus do not affect firms' key financial ratios. Thus, firm size seems to be well suited to capture effects of economies of scale rather than information asymmetries, and we corroborate our prediction that sponsors choose PF over CF when issuing large amounts of debt due to issuance costs.

Results from models [8] and [9] document that firms' financial leverage does not impact their likelihood of accessing PF markets. We also find, contrary to what we expected, an insignificant (model [8]) or a significant negative (model [9]) relationship between the market to book ratio and the likelihood of observing a PF deal. However, to control for the possibility that PF could be advantageous in reducing debt overhang problems, which arise when a firm has high leverage and significant growth opportunities, in model [10], we include the interaction of total debt to total assets ratio with the market to book ratio. The insignificant impact of both the interaction term and the total debt to total assets ratio, implies that PF is not associated with firms with high agency costs of debt and more growth opportunities. Similar results are presented in model [11] for a sub-sample of switchers. So far, our results do not corroborate the debt overhang motivation of sponsoring firms to use PF.

To examine if firms with higher agency costs of free cash flow increase the likelihood of PF *vis-à-vis* CF, we re-estimate model [10] by including the free cash flow to total assets ratio as an

additional independent variable. Contrary to what we expected, model [12] shows a significant negative relationship between the free cash flow to assets ratio and the probability of observing a PF transaction. Therefore, using firm-level data, our results do not corroborate those of Subramanian and Tung (2016), who find a positive relationship between industry's free cash flow to total assets' averages and the sponsoring firms' choice of a PF transaction. It is important to note that when controlling for the free cash flow to total assets ratio, the coefficients of market to book ratio as well as the interaction of debt to total assets ratio with the market to book ratio positively and significantly affect the likelihood of observing a PF deal, implying that PF is associated with firms with high agency costs of debt and larger growth opportunity sets. We will examine this topic further in section 5.4, when focusing our analysis on switchers and after building a matched sample of CF deals.

To investigate further the asymmetric information motivation, we re-estimate model [10] by including the EPS surprise. Results presented in model [13] show that EPS surprise positively affects the likelihood of observing a PF transaction, which 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 and thus reduce asymmetric information costs.

We find that, when controlling for other micro and macro variables, profitability reduces the likelihood of accessing the PF market, which is in line with the argument that firms with lower profitability use PF rather than CF to implement large, risky projects. In line with PF literature (Nevitt and Fabozzi 2001, Gatti 2008), we thus show that firms choose off-balance-sheet over on-balance-sheet financing to improve or maintain sponsors' key financial ratios. Results also show that firms that employ both PF and CF lending within our sample period - switchers - are more likely to choose PF deals when issuing new debt. Sponsors that have already participated in PF face lower transaction costs, which is no surprise as PF transactions are expensive to orchestrate and take longer to execute. Additionally, the fixed assets to total assets ratio does not affect the probability of observing a PF deal.

Concerning variables that represent the supply side conditions of the syndicated loan market, results document that the less important the reputation of the lead arranger(s), as well as the larger the size of the bank syndicate, the higher the probability of observing a PF deal. On the contrary, a domestic lead arranger reduces the likelihood of a PF deal *versus* a CF deal. Our results only corroborate Esty

(2003) and Corielli *et al.* (2010), who point out that PF is most commonly used in riskier countries, in model [8]; for the remaining models, we find an insignificant impact of sovereign credit risk on the choice process, which does not corroborate the risk management motivation for using PF over CF. These results might be explained by the fact that our sample includes syndicated deals arranged for projects located in OECD countries, mainly in the U.S. and Western Europe (W.E.). As we expected, both financial crisis and sovereign crisis dummy variables significantly and positively affect the sponsors' choice of PF over CF deals in all models.

Results also document that market volatility does not affect – models [8] to [11] – or negatively affects – models [12] and [13] – the probability of observing a PF deal. Finally, we find that, with the exception of model [11] for a sample of switchers only, the yield curve slope negatively influences the probability of observing a PF deal *versus* a CF deal in all models.

By comparing PF and CF debt choices for non-switchers, switchers and all firms, we find evidence that firms use PF to reduce underinvestment due to asymmetric information problems. So far, we do not find evidence that the debt choice is related to the agency cost motivation: results do not corroborate that firms with higher deadweight costs resulting from the debt overhang problem, and those with higher agency costs of free cash flow, are more likely to choose PF. We also find that larger firms choose PF rather than CF when issuing relatively large amounts of debt, because of the potential economies of scale in relation to issuance costs for PF. Finally, we find that firms with lower profitability use PF rather than CF to implement large, risky projects. PF deals allow sponsors to maintain financial flexibility by creating non-recourse vehicle entities. In turn, this helps sponsors protect or improve their financial ratios, with a limited impact on sponsors' creditworthiness.

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

In this section, we carry out a logistic regression on the various samples, with the objective of examining whether the credit risk and the cost of funding affect the choice between PF and CF deals. In other words, we first want to examine if sponsoring firms use PF to mitigate underinvestment problems due to distress costs; i.e., if off-balance-sheet financing can create value especially for sponsoring firms that are risky. Second, building on the evidence obtained in section 4 that PF deals have a higher cost of borrowing than CF, we analyze how such cost affects the choice process. The

Figure in Appendix B provides histograms measuring the percentage of firms using PF *versus* CF, grouped per Z-score quartiles. Within the set of firms with the lowest Z-scores (Q1), usage of PF (52.45%) is more than twice that of CF deals (22.75%) and decreases with the decrease of credit risk: 31.81% in Q2, 12.52% in Q3 and 3.21% in Q4. For CF, we have a hump-shaped relationship; i.e., borrowers in the middle of the credit risk distribution tend to raise funds in the corporate syndicated loans market, while the most creditworthy, as well as the least creditworthy firms, use other financing mechanisms (e.g., corporate bonds and leases).

Results reported in models [14] to [19] of Table 10 indicate, as expected, that the less creditworthy firms, on average, prefer PF to CF deals. Hence, firms with lower Z-scores prefer PF as it prevents contamination risk: the separation of projects in an SPV prevents the new project from contaminating the firm or other projects with a positive NPV. Thus, our results support the risk management motivation of using PF, as these SF deals are more relevant for sponsors with higher expected costs of distress, either from a higher probability of distress or higher costs given distress.

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

Concerning the impact of WAS on the choice between PF and CF deals, results for our samples, including non-switchers only, switchers only, or both firm types, document that there is a significant positive relationship between our cost of borrowing proxy – the *adjusted WAS* variable – and the probability of observing a PF deal. Additionally, the results presented in Table 10 are similar when controlling for Z-score and WAS. Firms that choose PF are relatively larger, less profitable, and seek long-term financing to raise higher amounts of debt. Moreover, non-switchers with larger fixed assets to total assets ratios prefer PF over CF, an already established relationship with a lender (or a syndicate of lenders) decreases the probability of observing a PF deal, and transaction cost considerations may lead switchers to choose PF for new debt funding. Finally, when controlling for credit risk, results seem to support the debt overhang motivation of using PF for switchers: both market to book and the interaction between debt to total assets and market to book variables significantly and positively affect the likelihood of sponsoring firms choosing PF *vis-à-vis* CF.

5.4. Focusing on the switchers and a matched sample

Sponsors that switch between PF and CF, those that use extensively both on-and off-balance-sheet syndicated debt, may provide interesting insights into the choice determinants. Additionally, a switcher-focused analysis will solve endogeneity concerns that may arise in the choice between PF and CF in the previous sections. In fact, we do not know whether PF was chosen because the firm has high credit risk and did not get access to CF or because the firm had the option to choose between PF and CF and decided to choose PF. In this section, we examine this subsample of firms, with three objectives. First, our previous results show clearly that PF transactions are typically used for funding public and private capital-intensive facilities and utilities. As presented in Table 1, deals implemented by switchers are concentrated in core industries - utilities, construction/heavy engineering, oil and gas, transportation, real estate, and machinery and equipment industries account for 83% of the total debt raised between 2000 and 2020. From these industries, utilities concentrate 46.33% of all syndicated lending (54.88% and 53.33% for switchers within 365 days and 730 days, respectively). Thus, the capital-intensive sector, more precisely the utilities sector, represents an interesting framework for analyzing the choice between PF and CF. In this way, we try to avoid limitations that may exist in previous sections by comparing the choice process for investment projects with similar characteristics (models [20] and [21], in Table 11). Second, we re-estimate model [20] by including the free cash flow to assets ratio as an additional control variable, to examine again if firms with higher agency costs of free cash flow increase the likelihood of PF *vis-à-vis* CF (model [22]). Finally, we re-estimate model [20] by including EPS surprise, a proxy for asymmetric information (model [23]).

In addition, we use a PSM to match deals borrowed using CF and PF (see Table 8). This allows us to examine what is correlated at firm level with the choice between PF and CF, by matching PF with CF deals based on deal-level observables (year, industry, deal size and WAM).

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

Columns 1 to 4 of Table 11 show that the significance and sign of the coefficients are similar in the four models and in line with those presented in Table 9. Our results corroborate the asymmetric information motivation for sponsoring firms using PF; i.e., firms that switch between PF and CF, with higher information asymmetry, prefer PF to CF to implement large projects. We find that while the dummy variable *former lender* has a significant negative effect on the choice of PF, the higher WAM

increases the probability of observing a PF deal for all models. Additionally, results in model [23] show that, as in model [13] of Table 9, the EPS surprise variable positively affect the likelihood of observing a PF transaction.

We find that switchers choose PF for relatively large amounts of debt to economize on scale, as both firm size and deal size positively affect the choice of PF deals, and firms resorting to PF are less profitable. As with model [12] in Table 9 for all firms, model [22] again shows no evidence in favor of the agency cost motivation for sponsoring firms using PF *versus* CF, as the free cash flow to total assets variable has an insignificant impact on the probability of observing a PF deal.

Results also corroborate the debt overhang motivation for switchers in the utilities industry (model [21]): highly levered firms with high agency costs of debt and with more growth opportunities prefer PF to CF to reduce leverage-induced underinvestment. Similar results are presented in models [24] and [25] for our matched sample. In model [25], we also control for Z-score and corroborate the findings obtained previously for all firms, non-switchers, and switchers samples: less creditworthy firms, on average, prefer PF to CF deals, which provides evidence in favor of the risk management motivation of using PF.

Hence, 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. These findings are corroborated when we use the switcher Fomento de Construcciones y Contratas, S.A. (FCC) as a case study. As shown in Appendix C, FCC closed 4 syndicated deals, 1 PF (deal closing date: May 29, 2007) and 3 CF deals (deal closing dates: November 6, 2006; January 18, 2007 and October 3, 2007), in the 2005-2007 period. The 3 CF deals have a loan purpose of 'corporate purposes' and the PF deal was closed in Austria by the SPE 'ASA Abfall Service Zisterdorf GmbH'. As can be read in the FCC 2007 Annual Report, the PF mechanism was used to construct and manage the 'Waste-to-Energy Plant Zistersdorf, which is the first incinerator of this type in the FCC CEE Group. The plant accepts communal and commercial wastes and produces electricity.' The usage of PF follows a significant increase in size, leverage and growth opportunities in the 3 years prior to the closing of the PF deal. Similarly, the FCC profitability and creditworthiness were significantly reduced between 2004 and 2006 - the return on assets ratio

decreased from 6.05% to 4.77%, while the Z-score declined from 1.91 to 1.13. In addition, PF allows FCC to obtain funding with longer maturities.

5.5. Robustness checks

We perform a number of additional robustness checks that further control for results in Tables 9 to 11. First, we evaluate which of the variables have significant and independent effects on the choice by including only 'capital expenditure' or 'corporate purpose' loans as our CF comparators to PF. We thus exclude, as in Subramanian and Tung (2016), 'asset-based' full recourse loans with a loan purpose category of 'equipment purchase', 'aircraft finance', 'ship finance', 'lease finance', 'real estate', and 'telecom build-out'. Second, we examine whether debt financing choices change over time. Specifically, we test the robustness of our results by re-estimating our models for a pre-crisis period, incorporating all deals before the Lehman Brothers bankruptcy on September 14, 2008, while transactions thereafter occur in the crisis period. We also examined whether switchers' choices are different for deals closed in the U.S. than in W.E. Overall, our estimates remain qualitatively the same.

6. Summary and conclusions

Decisions that affect the boundaries of the firm are among the most important faced by management, and have recently received a great deal of attention. This paper provides empirical evidence on firms' borrowing decisions, namely on the factors that influence a borrower's choice between off-balance-sheet financing via project financing (PF) and on-balance-sheet financing via corporate financing (CF). The paper does not support extant theoretical literature suggesting that PF deals reduce the cost of borrowing *vis-à-vis* comparable CF deals. We find that PF deal's adjusted weighted average spread is higher than that of CF deals and changes in PF sponsors' credit risk are not significantly different when compared with a matched sample of CF users.

By comparing firms' debt choices, our results are consistent with the use of PF as a mechanism that facilitates the reduction of the deadweight costs from asymmetric information problems and mitigates underinvestment problems due to distress costs. Interestingly, we find that firms resorting to PF are less profitable than comparable firms and that transaction cost considerations lead switchers to choose PF for new debt. Finally, results show that public firms choose PF for relatively large amounts

of debt to economize on scale, and switchers in the utilities industry with high agency costs of debt and with larger growth opportunity sets are more likely to choose PF rather than CF.

Our results are important for financial intermediation because we show that borrowers' characteristics, contractual specific features and macroeconomic factors affect the choice between PF and CF deals. Our results are important to corporate finance because syndicated loans are a primary source of debt financing for large publicly traded corporations (Becker and Ivashina 2013). Additionally, our results are consistent with the use of PF to mitigate the debt-overhang problem, reduce asymmetric information costs, and improve risk management in capital-intensive industries by creating a 'nexus of contracts' between the players involved. These results are stronger for switchers. Finally, our evidence is important for regulators. Considering the important role of PF in promoting public investment, not only during the European sovereign debt crisis, but also in the global economic recovery in the post-Covid-19 pandemic, regulators should rethink the higher capital requirements imposed by Basel III capital adequacy standards on banks' PF business.

The contract design theory posits that a debt contract is a vector of several terms such as price, maturity, collateral, and covenants (Allen and Winton 1995, Hart 2001). Even if our results show that price terms were higher for PF than for CF deals, other contractual non-price aspects might be systematically different, thus imposing different all-in true costs. The theoretical optimum is obtained when marginal all-inclusive costs equal marginal all-inclusive benefits, and not only weighted average spreads as in our analysis. We, therefore, consider that further analysis of the impact of PF on sponsoring firms' cost of borrowing, considering other terms that affect contract design, is an important avenue for future research. Structured finance activities provide an interesting opportunity to study the determinants of the boundaries of the firm, and to gain a better understanding of the effect of the organization of corporate investment on firm value. We think that an analysis of why firms use off-balance-sheet vehicles to finance large transactions such as leveraged acquisitions, structured leases and asset securitization deals are important contributions to this literature.

References

Ajinkya, B., R. Atiase, and M. Gift. (1991). "Volume of trading and the dispersion in financial analysts' earnings forecasts." *Accounting Review* 66, 389-401.

Allen, F., and A. Winton. (1995). "Corporate financial structure, incentives and optimal contracting." In Finance - Handbooks in Operations Research and Management Science, edited by R. Jarrow, V. Maksimovic, and W. Ziemba, 693-720. Amsterdam: Elsevier.

Altinkiliç, O., and R. Hansen. (2000). "Are There Economies of Scale in Underwriting Fees? Evidence of Rising External Financing Costs." *Review of Financial Studies* 13, 191-218.

Altman, E. (1993). "Corporate Financial Distress and Bankruptcy." New York: Wiley.

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

An, Y., and K. Cheung. (2010). "Project financing: Deal or no deal." *Review of Financial Economics* 19, 72-77.

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

Becker, B., and V. Ivashina (2013). "Cyclicality of credit supply: Firm level evidence." *Journal of Monetary Economics* 62, 76-93.

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

Berkovitch, E., and E. Han Kim. (1990). "Financial contracting and leverage induced over- and under-investment incentives." *Journal of Finance* 45, 765-794.

Blackwell, D., and D. Kidwell. (1988). "An Investigation of cost differences between public sales and private placements of debt." *Journal of Financial Economics* 22, 253-278.

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

Boot, A. (2000). "Relationship Banking: What Do We Know?" *Journal of Financial Intermediation* 9, 7-25.

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

Brown, S, A. Stephen, and A. Hillegeist. (2009). "The effect of earnings surprises on information asymmetry." *Journal of Accounting and Economics* 47, 208-225.

Byoun, S., J. Kim, and S. S. Yoo. (2013). "Risk Management with Leverage: Evidence from Project Finance." *Journal of Financial and Quantitative Analysis* 48, 549-577.

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

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

Casu, B., A. Clare, A. Sarkisyan, and S. Thomas. (2013). "Securitization and Bank Performance." *Journal of Money, Credit and Banking* 45, 1617-1658.

Chemmanur, T., and K. John. (1996). "Optimal incorporation, structure of debt contracts and limited recourse project finance." *Journal of Financial Intermediation* 5, 372-408.

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

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

Dailami, M., and R. Hauswald. (2007). "Credit-spread determinants and interlocking contracts: A study of the Ras Gas project." *Journal of Financial Economics* 86, 248-278.

Degryse, H., M. Kim, and S. Ongena. (2009). Microeconometrics of banking: methods, applications, and results. New York: Oxford University Press.

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

Demirgüç-Kunt, A., and R. Levine. (2001). Financial Structure and Economic Growth: Cross-country Comparisons of Banks, Markets, and Development. Cambridge, MA: MIT Press.

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

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

Diamond, D. (1993). "Seniority and Maturity of Debt Contracts." *Journal of Financial Economics* 33, 341-368.

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

Esty, B. (1999). "Petrozuata: A case study of the effective use of project finance." *Journal of Applied Corporate Finance* 12, 26-42.

Esty, B. (2003). The Economic Motivations for Using Project Finance. Boston: Harvard Business School publishing.

Esty, B. (2004a). Modern Project Finance – A Casebook. New Jersey: Wiley.

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

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

Esty, B., and M. Kane. (2010). BP Amoco (A): Policy statement on the use of project finance, Harvard Business School case study No. 9-201-054.

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

Fabozzi, F., H. Davis, and M. Choudhry. (2006). Introduction to Structured Finance. New Jersey: Wiley.

Flannery, M. (1986). "Asymmetric Information and Risky Debt Maturity Choice." *Journal of Finance* 41, 19-37.

Flannery, M., J. Houston, and S. Venkataraman. (1993). "Financing multiple investment projects." *Financial Management* 22, 161-172.

Gatti, S. (2008). Project Finance in Theory and Practice – Designing, Structuring, and Financing Private and Public Projects. San Diego: Academic Press.

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

Gomes, A., and G. Phillips. (2012). "Why do public firms issue private and public securities?" *Journal of Financial Intermediation* 21, 619-658.

Grinblatt, M., and S. Titman. (2002). Financial Markets and Corporate Strategy. London: McGraw-Hill.

Hainz, C., and S. Kleimeier. (2012). "Political risk, project finance, and the participation of development banks in syndicated lending." *Journal of Financial Intermediation* 21, 287-314.

Hann, N., M. Ogneva, and O. Ozbas. (2013). "Corporate diversification and the cost of capital." *Journal of Finance* 68, 1961-1999.

Hart, O. (2001). "Financial contracting." *Journal of Economic Literature* 39, 1079-1100.

Holmstrom, B., and J. Roberts. (1998). "The boundaries of the firm revisited." *Journal of Economic Perspectives* 12, 73-94.

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

Jensen, M. (1986). "The agency costs of free cash flow." *American Economic Review* 76, 323-329.

Jensen, M., and W. Meckling. (1976). "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure." *Journal of Financial Economics* 3, 305-360.

John, T., and K. John. (1991). "Optimality of Project Financing: Theory and Empirical Implications in Finance and Accounting." *Review of Quantitative Finance and Accounting* 1, 51-74.

Kensinger, J., and J. Martin. (1988). "Project finance: Raising money the old-fashioned way." *Journal of Applied Corporate Finance* 1, 69-81.

Kleimeier, S., and R. Versteeg. (2010. "Project finance as a driver of economic growth in low-income countries." *Review of Financial Economics* 19, 49-59.

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

Klein, B., R. Crawford, and A. Alchian. (1978). "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process." *Journal of Law and Economics* 21, 297-326.

Klein, M., J. So, and B. Shin. (1996). "Transaction Costs in Private Infrastructure Projects-Are They Too High? Viewpoint, Note No. 95, The World Bank Group, October.

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

Kwan, S., and W. Carleton. (2010). "Financial contracting and the choice between private placement and publicly offered bonds." *Journal of Money, Credit and Banking* 42, 907-929.

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

Lang, M., and R. Lundholm. (1996). "Corporate disclosure policy and analyst behaviour." *Accounting Review* 71, 467-492.

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

Leland, H., and D. Pyle. (1977). "Information Asymmetries, Financial Structure, and Financial Intermediation." *Journal of Finance* 32, 371-387.

Lemmon, M., L. Liu, M. Mao, and G. Nini. (2014). "Securitization and Capital Structure in Nonfinancial Firms: An Empirical Investigation." *Journal of Finance* 69, 1787-1825.

Lokshin, M., and Z. Sajaia. (2004). "Maximum likelihood estimation of endogenous switching regression models." *Stata Journal* 4, 282-289.

Mills, L., and K. Newberry. (2005). "Firms' Off-Balance Sheet and Hybrid Debt Financing: Evidence from Their Book-Tax Reporting Differences." *Journal of Accounting Research* 43, 251-282.

Müllner, Jakob. (2017). "International project finance: review and implications for international finance and international business." *Management Review Quarterly* 67, 97-133.

Myers, S. (1977). "Determinants of Corporate Borrowing." *Journal of Financial Economics* 5, 147-175.

Myers, S., and N. Majluf. (1984). "Corporate financing and investment decisions when firms have information that investors do not have." *Journal of Financial Economics* 13, 187-221.

Nevitt, P., and F. Fabozzi. (2001). Project Financing. London: Euromoney.

Morellec, E., P. Valta, and A. Zhdanov. (2015). "Financing Investment: The Choice Between Bonds and Bank Loans." *Management Science* 61, 2580-2602.

Qian, J., and P. Strahan. (2007). "How laws and institutions shape financial contracts: the case of bank loans." *Journal of Finance* 62, 2803-2834.

Pinto, J., and M. Santos. (2019). "The choice between corporate and structured financing: evidence from new corporate borrowings." *The European Journal of Finance, forthcoming.*

Rajan, R. (1992). "Insiders and outsiders: The choice between informed and arm's-length debt." *Journal of finance* 47, 1367-1400.

Refinitiv. (2020). Global Project Finance Review, full year 2020. Deals Intelligence market reports, obtained from https://www.refinitiv.com/dealsintelligence.

Roberts, M., and T. Whited. (2013). "Endogeneity in empirical corporate finance." In Handbook of the Economics of Finance, edited by G. Constantinides, M. Harris, and R. Stulz, Vol. 2A, 493-572. Amsterdam: Elsevier.

Robinson, D. (2008). "Strategic Alliances and the Boundaries of the Firm." *Review of Financial Studies* 21, 649-681.

Rogerson, W. (1992). "Contractual Solutions for the Hold-Up Problem." *Review of Economic Studies* 59, 777-793.

Shah, S., and A. Thakor. (1987). "Optimal capital structure and project financing." *Journal of Economic Theory* 42, 209-243.

Smith, C., and J. Warner. (1979). "On financial contracting: An analysis of bond covenants." *Journal of Financial Economics* 7, 117-162.

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

Spamann, H. (2010). "The 'Antidirector Rights Index' Revisited." *Review of Financial Studies* 23, 467-486.

Stiglitz, J., and A. Weiss. (1981). "Credit Rationing in Markets with Incomplete Information." *American Economic Review* 71, 393-409.

Stulz, R. (1984). "Optimal hedging policies." *Journal of Financial and Quantitative Analysis* 19, 127-140.

Subramanian, K., and F. Tung. (2016). "Law and Project Finance." *Journal of Financial Intermediation* 25, 154-177.

Williamson, Oliver. (1979). "Transaction-Cost Economics: The Governance of Contractual Relations." *Journal of Law and Economics* 22, 233-261.

Zingales, L. (2000). "In Search of New Foundations." *Journal of Finance* 55, 1623-1653.

Table 1: Industrial distribution of deals closed by switchers

This table describes the industrial distribution of deals closed in OECD countries by switchers with accounting and market data available. We classify as switchers firms that close both PF and CF deals during the 2000-2020 period, 365 days and 730 days within the closing date. PF deals are those whereby the loan's primary purpose is 'project finance', while CF deals contain loans whose primary purposes are 'equipment purchase', 'aircraft finance', 'ship finance', 'lease finance', 'real estate', 'telecom build-out', 'capital expenditure' or 'corporate purposes'.

Industrial category of borrower	Switchers in the sample period				Switchers within 365 days				Switchers within 730 days			
	Number of deals	Number of switchers	Amount [$ Million]	Percent of total value	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	946	346	696,337	46.82%	434	207	299,809	39.61%	631	266	455,224	40.06%
Agriculture, Forestry and Fishing	10	10	2,074	0.14%	7	7	936	0.12%	8	8	1,242	0.11%
Communications	26	12	30,846	2.07%	8	4	11,712	1.55%	17	7	21,357	1.88%
Construction/Heavy Engineer	236	104	161,928	10.89%	147	68	108,408	14.32%	189	82	137,027	12.06%
Manufacturing	200	66	151,412	10.18%	90	44	51,059	6.75%	119	53	71,624	6.30%
Chemicals, Plastic and Rubber	44	13	49,548	3.33%	14	9	7,336	0.97%	18	11	10,250	0.90%
Food and Beverages	-	-	-	-	-	-	-	-	-	-	-	-
Machinery and Equipment	121	45	74,573	5.01%	62	29	34,720	4.59%	81	35	42,019	3.70%
Steel, Aluminum and other Metals	10	3	2,847	0.19%	4	2	1,150	0.15%	4	2	1,150	0.10%
Other	25	5	24,445	1.64%	10	4	7,853	1.04%	16	5	18,204	1.60%
Mining and Natural Resources	30	9	27,309	1.84%	12	3	14,381	1.90%	16	4	18,609	1.64%
Oil and Gas	141	42	122,311	8.22%	61	21	52,332	6.91%	107	32	101,709	8.95%
Real Estate	158	50	86,844	5.84%	44	25	22,711	3.00%	92	37	53,382	4.70%
Retail Trade	12	4	2,781	0.19%	1	1	114	0.02%	5	3	667	0.06%
Services	121	44	104,036	6.99%	57	31	32,958	4.35%	70	36	44,337	3.90%
Services - Capital intensive	74	29	89,259	6.00%	33	20	23,654	3.13%	41	25	33,696	2.97%
Services - Other	47	15	14,776	0.99%	24	11	9,304	1.23%	29	11	10,641	0.94%
Wholesale Trade	12	5	6,795	0.46%	7	3	5,197	0.69%	8	4	5,271	0.46%
Utilities	939	332	689,118	46.33%	590	249	415,418	54.88%	815	293	606,033	53.33%
Financial Institutions	-	-	-	-	-	-	-	-	-	-	-	-
Transportation	139	55	95,952	6.45%	66	36	35,766	4.73%	102	49	69,222	6.09%
Public Administration/Government	12	5	5,921	0.40%	12	5	5,921	0.78%	12	5	5,921	0.52%
Other	-	-	-	-	-	-	-	-	-	-	-	-
Total	**2,036**	**738**	**1,487,329**	**100%**	**1,102**	**497**	**756,914**	**100%**	**1,560**	**613**	**1,136,400**	**100%**

Table 2: Industrial and geographic distribution of the sample of syndicated deals

Panel A describes the industrial distribution of the sample of syndicated deals, whereas Panel B details the deal allocation to borrowers in a particular region. Data are for deals closed in 30 OECD countries during the 2000-2020 period, extended to firms with accounting and market data available. PF deals are those whereby the loan's primary purpose is 'project finance', while CF deals contain loans whose primary purposes are 'equipment purchase', 'aircraft finance', 'ship finance', 'lease finance', 'real estate', 'telecom build-out', 'capital expenditure' or 'corporate purposes'.

Panel A: Distribution of the sample of syndicated deals by industry

Borrower industry	PF deals			CF deals		
	Number of deals	Total value [$US Million]	Percent of total value	Number of deals	Total value [$US Million]	Percent of total value
Commercial and Industrial	404	147,617	38.97%	17,322	11,376,567	83.53%
Agriculture, Forestry and Fishing	16	2,484.7	0.66%	139	55,901.5	0.41%
Communications	8	7,736.6	2.04%	687	671,111.4	4.93%
Construction/Heavy Engineer	151	66,862.7	17.65%	635	371,581.2	2.73%
Manufacturing	62	18,561	4.90%	6,053	4,175,738	30.66%
Chemicals, Plastic and Rubber	14	3,538.6	0.93%	1,240	1,032,097.9	7.58%
Machinery and Equipment	37	12,077.8	3.19%	2,886	2,022,230.0	14.85%
Steel, Aluminum and other Metals	5	2,091.4	0.55%	604	352,738.4	2.59%
Other	6	852.9	0.23%	1,323	768,672.0	5.64%
Mining and Natural Resources	16	6,609.7	1.74%	266	227,046.7	1.67%
Oil and Gas	39	22,472.9	5.93%	1,105	869,745.6	6.39%
Real Estate	34	6,154.4	1.62%	2,429	1,287,669.9	9.45%
Retail Trade	3	254.2	0.07%	1,588	987,937.2	7.25%
Services	68	15,380	4.06%	3,533	2,258,560	16.58%
Services - Capital intensive	56	13,079.7	3.45%	964	728,887.5	5.35%
Services - Other	12	2,299.8	0.61%	2,569	1,529,672.8	11.23%
Wholesale Trade	7	1,101.5	0.29%	887	471,274.8	3.46%
Utilities	596	198,683.1	52.45%	1,997	1,443,510.5	10.60%
Transportation	59	30,187.2	7.97%	1,219	750,036.6	5.51%
Public Administration/Government	12	2,330.2	0.62%	64	48,825.3	0.36%
Total	**1,071**	**378,818**	**100%**	**20,602**	**13,618,939**	**100%**

Panel B: Distribution of the sample of syndicated deals by region

Borrower domicile	PF deals			CF deals		
	Number of deals	Total value [$US Million]	Percent of total value	Number of deals	Total value [$US Million]	Percent of total value
Europe	756	266,410.4	70.33%	6,408	4,104,805.9	30.14%
Western Europe	746	255,932.2	67.56%	6,402	4,101,804.0	30.12%
Spain	215	64,300.0	16.99%	452	387,770.4	2.37%
U.K.	140	50,835.3	13.42%	1,775	1,022,744.9	7.57%
France	109	33,693.7	8.90%	831	624,209.2	3.81%
Portugal	35	15,400.7	4.07%	45	36,798.4	0.22%
Germany	32	16,650.9	4.40%	1,012	657,002.3	4.01%
Italy	62	15,610.9	4.12%	288	173,243.1	1.06%
Sweden	13	12,365.7	3.27%	276	153,287.0	0.94%
The Netherlands	20	11,512.9	3.04%	291	181,073.4	1.11%
Greece	21	6,727.6	1.78%	96	34,009.0	0.21%
Ireland	33	6,638.1	1.75%	174	144,743.7	0.88%
Other	66	22,196.3	5.83%	1,162	686,922.6	7.94%
Eastern Europe	10	10,478.1	2.77%	6	3,001.8	0.02%
North America	293	106,021	27.99%	14,128	9,483,495	69.63%
U.S.	292	105,265.1	27.79%	14,022	9,435,461.9	69.28%
Asia	8	3,154.4	0.83%	53	24,016.8	0.18%
Western Asia	2	1,127.6	0.30%	2	398.0	0.00%
Eastern Asia	6	2,026.8	0.54%	51	23,618.8	0.17%
Australia and Pacific	12	2,161.2	0.57%	3	898.2	0.01%
Latin America	2	1,070.5	0.28%	10	5,722.6	0.04%
Total	**1,071**	**378,818**	**100%**	**20,602**	**13,618,939**	**100%**

Table 3: Description of variables and their sources

Variable name	Variable definition	Source
Dependent variables		
Choice of debt	Dummy equal to 1 if the firm closes a PF deal and 0 if it, instead, closes a CF deal.	Authors'
Weighted average spread (WAS)	The weighted average between the loan spread and its weight in the deal size. Loan spread represents the spread paid by the borrower over Libor or Euribor plus the facility fee (all-in-spread-drawn), converted into dollar-equivalent spreads when necessary.	Dealscan
Adjusted WAS	The combination of the WAS for PF deals and the borrower's ratio of interest expense to average total debt for CF deals.	Dealscan & Datastream
Firm characteristics		
Log total assets	Natural logarithm of firm total assets measured in $ million.	Datastream
Debt to total assets	The ratio of total debt to total assets.	Datastream
Fixed assets to total assets	The ratio of fixed assets to total assets. Fixed assets include property, plant and equipment.	Datastream
Market to book	The sum of book value of liabilities and market value of equity divided by the book value of assets.	Datastream
Return on assets	The net income before preferred dividends minus preferred dividend requirement, divided by total assets.	Datastream
EPS surprise	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.	Datastream
Switcher	Dummy equal to 1 if firms used both PF and CF within our sample period (January 1, 2000 – December 31, 2016) and 0, otherwise.	Dealscan
Log Z-score	Logarithm of Altman's (1993) Z-score. Altman's Z-score is calculated as Z= 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings Before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Liabilities) + 0.999 (Net Sales/Total Assets).	Datastream
Interest expense to debt	The ratio of interest expense to average total debt. Computed for borrowers in CF deals.	Datastream
Contractual characteristics		
Log deal size	Natural logarithm of the deal size measured in $ million.	Dealscan
Weighted average maturity (WAM)	The weighted average between the loan maturity, in years, and its weight in the deal size.	Dealscan
Domestic lead bank	Dummy equal to 1 if the bank's syndicate lead bank's (or at least one of the lead banks) nationality is the same as the deal country and 0, otherwise.	Dealscan
Number of banks	The number of lending banks in the deal's bank syndicate.	Dealscan
Number of tranches	The number of loans per deal.	Dealscan
Bank reputation	Computed according to the global mandated arrangers league tables provided by Thomson Reuters – ranks range from 1 (best) to 25 (worst). If the bank does not appear in the league table it is rated 26.	Thomson Reuters DMI
Former lender	Dummy equal to 1 if one of the arranging banks in the syndicate was a former lender - debt extented as a repeated deal - and 0, otherwise.	Dealscan
Macroeconomic factors		
Country rating	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.	S&P
Financial crisis	Dummy equal to 1 if the closing date falls within the 2007-2008 financial crisis period (September 15, 2008 – December 31, 2014) and 0, otherwise.	Authors'
Sovereign crisis	Dummy equal to 1 if the closing date falls within the sovereign debt crisis period (April 24, 2010 – December 31, 2016) and 0, otherwise.	Authors'
Volatility	The Chicago Board Options Exchange Volatility Index (VIX). VIX reflects a market estimate of future volatility.	Datastream
5YrTB-3mTB	The difference between the 5-year and 3-month U.S. T-bills' yield at the deal closing date.	Datastream

Table 4: Descriptive statistics for PF and CF deals' samples

Panel A presents the descriptive statistics of PF and CF samples of syndicated deals closed in 30 OECD countries, during the 2000-2020 period, extended to firms with accounting and market data available: the full sample. Panel B presents descriptive statistics for a sub-sample of PF deals and a matched sample of CF deals with available information on WAS. To create a matched sample of CF deals, we employ a propensity score matching (PSM) approach, by creating a 1 to 1 matching algorithm that captures the most identical firm in the same year (T-1) that uses CF, using the following firm characteristics: size, leverage, asset tangibility, growth opportunities, profitability, and credit risk. PF deals are those whereby the loan's primary purpose is 'project finance', while CF deals contain loans whose primary purposes are 'equipment purchase', 'aircraft finance', 'ship finance', 'lease finance', 'real estate', 'telecom build-out', 'capital expenditure' or 'corporate purposes'. We test for similar distributions in contract characteristics using the Wilcoxon rank-sum test for continuous variables and the Chi-square test for discrete ones. ***, **, and * indicate significant difference at the 1%, 5%, and 10% levels, respectively, between the sample of PF deals and the sample of CF deals. For a definition of the variables, see Table 3.

Panel A: Full sample

Variable of interest - continuous variables	PF deals						CF deals						
	Number	Mean	Median	Std. Dev.	Min	Max	Number	Mean	Median	Std. Dev.	Min	Max	
WAS [bps]	382	200.40	170.00	132.46	10.62	1,000.00	14,860	195.07	172.50	122.63	6.00	1,075.00	
Adjusted WAS [bps]	382	200.40	170.00	132.46	10.62	1,000.00	14,860	66.19	57.13	53.57	0.62	197.95	***
Country rating [1-22 weak]	382	1.94	1.00	2.19	1.00	13.00	14,860	1.25	1.00	1.27	1.00	21.00	***
Deal size [$ million]	382	527.56	274.88	688.22	8.00	4,400.00	14,860	714.13	400.00	833.01	8.00	4,989.00	***
Number of tranches	382	2.26	2.00	1.46	1.00	8.00	14,860	1.41	1.00	0.82	1.00	18.00	***
WAM [years]	382	11.09	9.16	7.27	0.33	31.69	14,860	4.25	5.00	1.69	0.08	59.92	***
Number of banks	382	7.18	5.00	6.72	1.00	47.00	14,860	8.22	6.00	7.13	1.00	176.00	***
Bank reputation [1-26]	382	15.58	19.00	9.77	1.00	26.00	14,860	5.92	2.00	8.55	1.00	26.00	***

Variable of interest - discrete variables	PF deals			CF deals			
	Number	% of total	Nr. (D=1)	Number	% of total	Nr. (D=1)	
Deal arranged by a former lender	382	19.11%	73	14,860	66.02%	9,811	***
Deal closed in the financial crisis period	382	10.21%	39	14,860	4.19%	623	***
Deal closed in the sovereign debt crisis period	382	44.24%	169	14,860	65.73%	9,767	***
Deal arranged by a domestic lead bank	382	51.83%	198	14,860	82.91%	12,320	***
Deals with currency risk	382	10.21%	39	14,860	6.49%	965	***

Panel B: Matched sample

Variable of interest - continuous variables	PF deals						CF deals						
	Number	Mean	Median	Std. Dev.	Min	Max	Number	Mean	Median	Std. Dev.	Min	Max	
WAS [bps]	310	196.32	162.50	130.83	10.62	1,000.00	310	193.09	175.00	123.94	15.00	750.00	
Adjusted WAS [bps]	310	196.32	162.50	130.83	10.62	1,000.00	310	57.68	52.68	31.81	1.04	36.84	***
Country rating [1-22 weak]	310	2.06	1.00	2.33	1.00	13.00	310	1.42	1.00	1.74	1.00	17.00	***
Deal size [$ million]	310	525.10	273.64	651.45	8.00	4,400.00	310	978.73	526.13	1,092.42	9.25	4,756.15	***
Number of tranches	310	2.27	2.00	1.47	1.00	8.00	310	1.45	1.00	0.81	1.00	6.00	***
WAM [years]	310	11.50	10.00	7.38	0.33	31.69	310	4.29	4.92	3.67	0.33	59.92	***
Number of banks	310	7.07	5.00	6.65	1.00	47.00	310	9.35	7.00	7.79	1.00	42.00	***
Bank reputation [1-26]	310	15.58	19.00	9.70	1.00	26.00	310	6.74	2.00	9.20	1.00	26.00	***

Variable of interest - discrete variables	PF deals			CF deals			
	Number	% of total	Nr. (D=1)	Number	% of total	Nr. (D=1)	
Deal arranged by a former lender	310	20.32%	63	310	68.39%	212	***
Deal closed in the financial crisis period	310	10.97%	34	310	4.52%	14	***
Deal closed in the sovereign debt crisis period	310	44.84%	139	310	71.61%	222	***
Deal arranged by a domestic lead bank	310	50.97%	158	310	77.10%	239	***
Deals with currency risk	310	9.68%	30	310	7.10%	22	

Table 5: Regression analyses of the cost of borrowing: PF *versus* CF syndicated deals

This table presents the results of OLS regressions analyzing the determinants of syndicated deals adjusted WAS for the full sample of PF and CF deals presented in Panel A of Table 4 – models [1] and [2]. Model [3] isolates the syndicated deals closed by switchers, while model [4] focuses on a subsample of deals closed by sponsoring firms and a matched sample (control group) of non-PF users – Panel B of Table 4. For each independent variable, the first row reports the estimated coefficient, and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Dependent variable:	[1]	[2]	[3]	[4]
Adjusted WAS (bps)	Full sample	Full sample	Switchers	Matched sample
Independent variables:				
Intercept	22.834 ***	21.225 ***	45.229 **	75.141 **
	(0.000)	(0.000)	(0.030)	(0.028)
PF	213.475 ***	209.119 ***	207.687 ***	227.660 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Log total assets	-1.486 ***	-1.356 ***	-4.228 ***	-4.402 *
	(0.000)	(0.001)	(0.000)	(0.063)
Debt to total assets	-0.388	-3.913 ***	-1.288	-19.405
	(0.104)	(0.000)	(0.896)	(0.265)
Market to book	0.000	-0.003	-0.013 ***	-0.018 **
	(0.863)	(0.407)	(0.002)	(0.025)
Return on assets	0.066	-1.010	-6.705	-11.792
	(0.884)	(0.105)	(0.813)	(0.337)
Fixed assets to total assets	-0.280	0.639	1.473	-16.777
	(0.802)	(0.668)	(0.843)	(0.270)
Log Z-score		-1.176 **	-5.092	-12.588
		(0.045)	(0.198)	(0.101)
Former lender	-0.233	-0.649	-3.905	-10.523
	(0.593)	(0.273)	(0.323)	(0.151)
Log deal size	1.070 **	1.031 **	2.792	0.646
	(0.012)	(0.047)	(0.110)	(0.911)
WAM	-1.479 ***	-1.418 ***	-1.757 **	-1.639 *
	(0.001)	(0.002)	(0.010)	(0.089)
Number of tranches	-0.738	-0.757	-2.435 *	-6.329
	(0.110)	(0.183)	(0.070)	(0.153)
Switcher	0.536	-0.315		-1.005
	(0.731)	(0.756)		(0.90)
Domestic lead bank	-0.478	0.394	0.341	9.297
	(0.480)	(0.596)	(0.907)	(0.190)
Bank reputation	0.051 *	0.021	-0.230	0.171
	(0.065)	(0.522)	(0.196)	(0.688)
Number of banks	-0.002	-0.005	-0.212	-0.483
	(0.905)	(0.838)	(0.199)	(0.260)
Country rating	3.164 ***	3.150 ***	4.206 ***	8.168 ***
	(0.000)	(0.000)	(0.000)	(0.002)
Financial crisis	6.416 ***	6.144 ***	43.046 ***	98.590 ***
	(0.000)	(0.000)	(0.000)	(0.000)
Sovereign crisis	2.374 **	2.840 **	23.291 ***	62.651 ***
	(0.043)	(0.033)	(0.000)	(0.000)
Volatility	-0.025	-0.019	0.118	-0.563 *
	(0.488)	(0.572)	(0.355)	(0.052)
5YrTB-3mTB	0.016 **	0.020 ***	0.115 ***	0.192 ***
	(0.024)	(0.009)	(0.002)	(0.004)
Industry fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Country fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Number of observations	15,242	11,199	1,256	620
PF deals	*382*	*288*	*205*	*310*
CF deals	*14,860*	*10,911*	*1,051*	*310*
Adjusted R^2	0.683	0.681	0.701	0.636

Table 6: Cost of borrowing and public firms' debt choice

This table presents the results of estimating endogenous switching regression models on sub-samples for which information on adjusted WAS is available. We implement the full information maximum likelihood (FIML) method to simultaneously estimate binary and continuous parts of the model in order to yield consistent standard errors. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. For each model, we also calculate the average treatment effect (ATE) for WAS of PF *versus* CF. Standard errors for the ATEs were obtained through bootstrapping. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Dependent variable:	[5] All firms		[6] Switchers		[7] Matched sample	
Adjusted WAS (bps)	PF	CF	PF	CF	PF	CF
Independent variables:						
Intercept	393.721 ***	18.427 ***	537.280 ***	14.035 ***	334.316 ***	13.016 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Log total assets	-13.568 ***	-0.743 ***	-24.689 ***	-0.408 ***	-11.753 ***	-0.848 ***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Debt to total assets	-19.696	-0.337 **	3.625	-3.163 **	-49.763	0.696
	(0.569)	(0.012)	(0.932)	(0.038)	(0.419)	(0.584)
Market to book	-0.012	0.002	-0.028 ***	0.000	-0.043	0.005 ***
	(0.257)	(0.106)	(0.004)	(0.179)	(0.257)	(0.010)
Return on assets	-79.730	-0.240	-42.961	3.403	54.349	0.726
	(0.138)	(0.413)	(0.703)	(0.377)	(0.509)	(0.358)
Fixed assets to total assets	46.729 *	-0.920 ***	10.096	0.176	30.201	-0.266
	(0.061)	(0.000)	(0.704)	(0.576)	(0.349)	(0.715)
Log Z-score	-1.754 **	-0.847 **	-12.498	-0.833 **	-12.932	-0.422
	(0.025)	(0.043)	(0.253)	(0.043)	(0.571)	(0.209)
Former lender	5.203	0.179	1.132	0.029	-25.926	1.800 **
	(0.701)	(0.121)	(0.947)	(0.903)	(0.455)	(0.011)
Log deal size	-0.388	0.258 ***	7.236	-0.085	-4.202	0.921 ***
	(0.960)	(0.000)	(0.275)	(0.388)	(0.805)	(0.000)
WAM	-2.141 ***	-0.268 ***	-1.397 *	0.003	-0.117	-0.208 *
	(0.001)	(0.000)	(0.054)	(0.900)	(0.963)	(0.096)
Number of tranches	-5.320	-0.113 **	-0.782	0.080	0.394	-0.796 ***
	(0.171)	(0.038)	(0.847)	(0.391)	(0.968)	(0.009)
Switcher	3.211	-0.753 ***				
	(0.814)	(0.000)				
Domestic lead bank	-3.798	-0.081	7.505	-0.016	9.893	0.382
	(0.760)	(0.474)	(0.532)	(0.937)	(0.551)	(0.425)
Bank reputation	-0.072	-0.015 **	-1.855 **	0.000	0.054	-0.061 *
	(0.925)	(0.029)	(0.036)	(0.976)	(0.970)	(0.077)
Number of banks	-1.386	-0.018 ***	-1.739 *	0.014	-0.830	-0.035
	(0.138)	(0.001)	(0.071)	(0.156)	(0.622)	(0.217)
Country rating	5.082	-0.018	10.003 ***	0.035	8.466 **	-0.131
	(0.118)	(0.657)	(0.001)	(0.433)	(0.011)	(0.171)
Financial crisis	176.170 ***	-1.063 ***	177.270 ***	-0.638	181.837 ***	-0.274
	(0.000)	(0.000)	(0.000)	(0.246)	(0.000)	(0.826)
Sovereign crisis	111.074 ***	-1.337 ***	102.728 ***	-1.453 ***	113.636 ***	-0.356
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.618)
Volatility	-1.713 *	0.010	-1.247	0.016	-1.835	0.015
	(0.055)	(0.104)	(0.162)	(0.226)	(0.138)	(0.723)
5YrTB-3mTB	0.257 **	0.005 ***	0.133	0.004 **	0.165	0.007
	(0.026)	(0.000)	(0.333)	(0.020)	(0.434)	(0.101)

(Continued)

(continued)

Dependent variable: Probability of observing	[5] PF versus CF	[6] PF versus CF	[7] PF versus CF
Log total assets	0.161 ***	0.069 ***	0.225 **
	(0.000)	(0.007)	(0.017)
Debt to total assets	0.094 ***	0.604	-0.316
	(0.000)	(0.185)	(0.680)
Market to book	-0.001 *	-0.001 ***	-0.001
	(0.080)	(0.000)	(0.480)
Return on assets	-0.078 **	-3.203 ***	-0.371
	(0.024)	(0.002)	(0.429)
Fixed assets to total assets	0.438 ***	0.306 **	0.236
	(0.000)	(0.018)	(0.296)
Former lender	-0.117 **	-0.699 ***	-0.598 ***
	(0.019)	(0.000)	(0.000)
Log deal size	-0.058 **	-0.216 ***	-0.221 ***
	(0.033)	(0.001)	(0.001)
WAM	0.069 ***	0.116 ***	0.073 **
	(0.000)	(0.000)	(0.047)
Log Z-score	-0.730 **	-0.227 **	-0.074
	(0.024)	(0.032)	(0.626)
Number of tranches	0.079 ***	0.256 ***	0.242 **
	(0.000)	(0.000)	(0.046)
Switcher	0.494 ***		
	(0.000)		
Domestic lead bank	-0.037	-0.198 *	-0.067
	(0.561)	(0.094)	(0.653)
Bank reputation	0.010 ***	0.012 *	0.029 ***
	(0.000)	(0.084)	(0.000)
Number of banks	0.011 ***	0.017 **	0.019 **
	(0.000)	(0.023)	(0.022)
Country rating	-0.004	0.057 **	0.032
	(0.720)	(0.039)	(0.285)
Financial crisis	0.284 ***	-0.111	-0.009
	(0.008)	(0.645)	(0.978)
Sovereign crisis	0.100 *	-0.664 ***	-0.511 **
	(0.083)	(0.000)	(0.038)
Volatility	-0.003	0.004	0.003
	(0.293)	(0.548)	(0.796)
5YrTB-3mTB	-0.001 **	0.001	-0.002 **
	(0.016)	(0.565)	(0.044)
Number of observations	11,199	1,256	620
Average treatment effect	180.29 ***	175.19 ***	180.03 ***
	(0.000)	(0.000)	(0.000)
Wald chi2	207.80 ***	675.76 ***	675.76 ***
	(0.000)	(0.000)	(0.000)
Log pseudolikelihood	-44,434.25	-4,109.84	-2,641.53
Wald test of indep. equations	5.47 **	69.04 ***	60.92 ***
	(0.019)	(0.000)	(0.000)

Table 7: Consequences of Project Financing

This table presents an event study of changes in firm characteristics around the closing of a PF transaction. *t* is the closing year and the table shows the means of the levels of variables as of one year before the PF deal, and differences *vis-à-vis t*-1 during the year of (*t*), the year after (*t*+1) and two years after (*t*+2) the closing of the PF deal. Panel A presents unadjusted sample means; Panel B presents sample means for the difference between the firm value and the contemporaneous mean for a set of matched firms. To create a matched sample, we employ a propensity score matching (PSM) approach, by creating a 1 to 1 matching algorithm that captures the most identical firm in the same year (*t*-1). The propensity score is created using the following firm characteristics: size, leverage, asset tangibility, growth opportunities, profitability, and credit risk. The sample includes 310 PF users and a control group of 310 non-users. p-values are reported in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Variable	**Level at**	**Change *vis-à-vis* *t*-1**		
	***t*-1**	***t***	***t*+1**	***t*+2**
Panel A: PF sponsors' means				
Debt to total assets	0.389	0.010	0.020 *	0.026 **
		(0.213)	(0.055)	(0.044)
Fixed assets to total assets	0.438	0.000	-0.008	-0.017
		(0.996)	(0.548)	(0.215)
Market to book ratio	5.037	1.226	-3.223	24.600
		(0.224)	(0.136)	(0.336)
Return on assets	0.047	-0.005	-0.008 *	-0.016 ***
		(0.170)	(0.071)	(0.002)
Z-Score	1.851	-0.245	-0.438 **	-0.657 *
		(0.158)	(0.024)	(0.094)
Panel B: Difference between PF sponsors and matched firms				
Debt to total assets	0.038 **	0.009	0.026 *	0.046 ***
	(0.050)	(0.378)	(0.055)	(0.004)
Fixed assets to total assets	0.034	-0.003	-0.009	-0.017
	(0.690)	(0.839)	(0.601)	(0.283)
Market to book ratio	0.826 **	0.897	-4.070 *	-0.647
	(0.027)	(0.417)	(0.079)	(0.986)
Return on assets	0.003	-0.003	-0.011	-0.010
	(0.590)	(0.613)	(0.232)	(0.303)
Z-Score	-0.071	-0.218	-0.389	-0.500
	(0.803)	(0.218)	(0.198)	(0.190)

Table 8: Descriptive statistics for public firms' characteristics

This table presents the descriptive statistics for firms' characteristics by category. The full sample includes 21,673 syndicated deals (1,071 PF deals and 20,602 CF deals) closed by 5,683 publicly traded firms – Panel A –, while the matched sample includes 1,216 syndicated deals (608 PF and CF deals) closed by 785 publicly traded firms – Panel B. To create a matched sample of firms that use CF, we employ a propensity score matching (PSM) approach, by creating a 1 to 1 matching algorithm that captures the most identical deal in the same year and industry, using the following characteristics: deal size and WAM. We test for similar distributions in public firms' characteristics across samples via the Wilcoxon rank-sum test. [a] denotes statistical difference at the 5% level between 'PF deals only' and 'CF deals only' subsamples; [b] denotes statistical difference at the 5% level between 'PF deals only' and 'PF and CF deals' subsamples; [c] denotes statistical difference at the 5% level between 'CF deals only' and 'PF and CF deals' subsamples. For a definition of the variables, see Table 3.

Panel A: Full sample

Variable of interest		Firms categorized according to choice of deals		
		[I] PF deals only	[II] CF deals only	[III] PF and CF deals (switchers)
Total assets ($ million)	Mean	52,381.32	13,368.45	34,820.96
	Median	5,179.43	2,277.32 [a]	13,230.31 [b] [c]
	Number	429	19,208	2,036
Debt to total assets	Mean	32.06%	34.80%	38.03%
	Median	28.37%	31.28%	36.48% [b] [c]
	Number	429	19,208	2,036
Fixed assets to total assets	Mean	39.01%	35.85%	45.77%
	Median	40.98%	27.32%	49.46% [b] [c]
	Number	429	19,208	2,036
Market to book	Mean	274.73%	283.22%	626.23%
	Median	253.18%	279.22% [a]	323.72% [b] [c]
	Number	429	19,208	2,036
Return on assets	Mean	-3.71%	3.01%	2.85%
	Median	3.20%	4.94% [a]	3.77% [b] [c]
	Number	429	19,208	2,036
EPS surprise	Mean	-2.62%	-0.37%	-1.36%
	Median	0.04%	0.04%	0.08% [c]
	Number	258	14,639	1,599
Free cash flow to total assets	Mean	0.43%	6.60%	5.44%
	Median	3.78%	7.21% [a]	5.53% [b] [c]
	Number	401	18,808	1,882
Z-score	Mean	2.30	3.69	1.92
	Median	1.29	2.47 [a]	1.17 [c]
	Number	339	15,160	1,672

Panel B: High-information sample

Variable of interest		Firms categorized according to choice of deals		
		[I] PF deals only	[II] CF deals only	[III] PF and CF deals (switchers)
Total assets ($ million)	Mean	58,087.46	21,605.45	31,138.38
	Median	7,186.90	2,564.48 [a]	8,228.22 [b] [c]
	Number	233	550	433
Debt to total assets	Mean	35.40%	36.62%	39.51%
	Median	33.23%	35.52%	38.68% [b] [c]
	Number	233	550	433
Fixed assets to total assets	Mean	46.03%	44.75%	44.04%
	Median	50.34%	43.09%	48.12%
	Number	233	550	433
Market to book	Mean	278.34%	273.82%	-215.12%
	Median	253.64%	247.79%	351.72% [b] [c]
	Number	233	550	433
Return on assets	Mean	-6.69%	4.00%	2.58%
	Median	3.26%	4.72% [a]	3.80% [b] [c]
	Number	233	550	433
EPS surprise	Mean	-0.69%	-0.96%	-0.97%
	Median	-0.01%	0.02%	0.11% [b] [c]
	Number	139	398	304
Free cash flow to total assets	Mean	-0.61%	6.96%	5.22%
	Median	3.98%	6.73% [a]	5.06% [b] [c]
	Number	222	534	360
Z-score	Mean	2.09	2.53	3.18
	Median	1.13	1.92 [a]	1.15 [c]
	Number	180	403	361

Table 9: Determinants of public firms' debt choice

This table presents the results of logistic regressions which predict public firms' choice between PF and CF. The dependent variable equals 1 when a firm selects PF lending and 0 when it chooses a CF deal. Model [8] includes firms that closed only one type of deal, while models [9], [10], [12], and [13] also include switchers. Model [11] includes deals extended to switchers only. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Dependent variable:						
Choice of debt	[8] Non-switchers	[9] All firms	[10] All firms	[11] Switchers	[12] All firms	[13] All firms
Independent variables:						
Intercept	-8.714 ***	-6.473 ***	-10.089 ***	-9.382 ***	-10.531 ***	-13.864 ***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)
Log total assets	0.340 ***	0.227 ***	0.463 ***	0.638 ***	0.494 ***	0.762 ***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Debt to total assets	-0.132	-0.082	-0.109	0.302	-0.242	-0.393
	(0.676)	(0.588)	(0.655)	(0.484)	(0.496)	(0.371)
Market to book	0.001	-0.001 ***	-0.001 ***	0.007	0.001 ***	0.004
	(0.761)	(0.000)	(0.000)	(0.576)	(0.000)	(0.106)
Return on assets	-0.232 ***	-0.185 **	-0.165 **	-1.271 **	-0.115 *	-2.140 ***
	(0.004)	(0.019)	(0.050)	(0.017)	(0.062)	(0.000)
Fixed assets to total assets	0.345	0.210	0.206	-0.359	0.274	-0.045
	(0.173)	(0.245)	(0.258)	(0.210)	(0.143)	(0.856)
Former lender	-2.014 ***	-1.752 ***	-1.746 ***	-1.371 ***	-1.756 ***	-1.718 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log deal size	-0.507 ***	-0.461 ***	0.265 **	1.269 **	0.257 **	0.609 **
	(0.000)	(0.000)	(0.043)	(0.012)	(0.047)	(0.023)
WAM	0.381 ***	0.347 ***	0.345 ***	0.284 ***	0.343 ***	0.330 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log total assets * Log deal size			-0.047 **	-0.106 ***	-0.047 **	-0.074 **
			(0.027)	(0.001)	(0.037)	(0.020)
Debt to total assets * Market to book			0.000	-0.015	0.001 ***	-0.009
			(0.670)	(0.551)	(0.004)	(0.481)
Free cash flow to total assets					-0.424 ***	
					(0.003)	
EPS surprise						0.570 ***
						(0.009)
Switcher		2.878 ***	2.882 ***		2.711 ***	2.773 ***
		(0.000)	(0.000)		(0.000)	(0.000)
Domestic lead bank	-0.481 ***	-0.545 ***	-0.539 ***	-0.513 ***	-0.565 ***	-0.572 ***
	(0.004)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Bank reputation	0.036 ***	0.040 ***	0.040 ***	0.036 ***	0.041 ***	0.035 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of banks	0.045 ***	0.035 ***	0.036 ***	0.021 *	0.039 ***	0.040 ***
	(0.000)	(0.000)	(0.000)	(0.054)	(0.000)	(0.000)
Country rating	0.049 **	0.002	0.004	-0.056	-0.006	-0.049
	(0.023)	(0.934)	(0.816)	(0.850)	(0.767)	(0.697)
Financial crisis	1.176 ***	0.849 ***	0.836 ***	0.470	1.013 ***	1.042 ***
	(0.003)	(0.001)	(0.002)	(0.202)	(0.000)	(0.005)
Sovereign crisis	1.025 ***	0.311 **	0.305 **	-0.370 **	0.478 ***	0.461 **
	(0.000)	(0.018)	(0.021)	(0.038)	(0.001)	(0.011)
Volatility	-0.008	-0.012	-0.011	-0.012	-0.014 *	-0.021 **
	(0.460)	(0.111)	(0.135)	(0.185)	(0.077)	(0.030)
5YrTB-3mTB	-0.007 ***	-0.004 ***	-0.004 ***	-0.001	-0.005 ***	-0.005 ***
	(0.000)	(0.000)	(0.000)	(0.432)	(0.000)	(0.001)
Industry fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Country fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Number of observations	19,637	21,673	21,673	2,036	21,091	16,496
PF deals	*429*	*1,071*	*1,071*	*642*	*796*	*622*
CF deals	*19,208*	*20,602*	*20,602*	*1,394*	*20,295*	*15,874*
Wald statistic	869 ***	1,921 ***	1,396 ***	337 ***	1,255 ***	1,030 ***
Correct predictions (%)	94.09	92.95	96.26	90.82	96.20	97.12
Max rescaled R-Squared	0.522	0.464	0.619	0.587	0.602	0.640

Table 10: Determinants of public firms' debt choice: the impact of credit risk and funding costs

This table presents the results of logistic regressions which predict public firms' choice between PF and CF. The dependent variable equals 1 when a firm selects PF lending and 0 when it chooses a CF deal. Models [14] and [15] include firms that closed only one type of deal, while models [16] and [17] also include switchers. Models [18] and [19] include deals extended to switchers only. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Dependent variable:	PF deal = 1, CF deal = 0					
Choice of debt	[14] Non-switchers	[15] Non-switchers	[16] All firms	[17] All firms	[18] Switchers	[19] Switchers
Independent variables:						
Intercept	-6.942 **	-8.382 ***	-11.678 ***	-13.364 ***	-9.387 **	-14.870 ***
	(0.016)	(0.008)	(0.000)	(0.000)	(0.013)	(0.003)
Log Z-score	-0.672 ***		-0.362 ***		-0.040 *	
	(0.000)		(0.001)		(0.078)	
Adjusted WAS		0.002 ***		0.001 ***		0.002 **
		(0.007)		(0.009)		(0.004)
Log total assets	0.315 *	0.176	0.633 ***	0.551 ***	0.647 ***	0.883 ***
	(0.100)	(0.409)	(0.000)	(0.003)	(0.005)	(0.004)
Debt to total assets	-1.608 ***	-0.290	-0.925 **	-0.471	0.980	0.061
	(0.010)	(0.653)	(0.030)	(0.306)	(0.151)	(0.926)
Market to book	0.001	0.001	-0.002 ***	-0.001 ***	0.055 ***	0.010
	(0.325)	(0.313)	(0.000)	(0.004)	(0.006)	(0.410)
Return on assets	-2.170 ***	-0.273 ***	-2.186 ***	-0.141 ***	-3.396 **	-1.503 **
	(0.008)	(0.000)	(0.002)	(0.001)	(0.029)	(0.024)
Fixed assets to total assets	1.146 ***	1.074 **	0.564 **	0.450	-0.459	-0.376
	(0.001)	(0.016)	(0.018)	(0.129)	(0.198)	(0.370)
Former lender	-2.252 ***	-2.444 ***	-1.808 ***	-1.809 ***	-1.384 ***	-1.345 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log deal size	1.182 **	1.517 ***	0.490	0.332	1.339 **	1.944 **
	(0.035)	(0.006)	(0.245)	(0.525)	(0.042)	(0.013)
WAM	0.381 ***	0.501 ***	0.333 ***	0.414 ***	0.273 ***	0.306 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log total assets * Log deal size	0.035	0.070 **	0.064 **	-0.043	-0.108 ***	-0.140 ***
	(0.321)	(0.046)	(0.015)	(0.191)	(0.007)	(0.004)
Debt to total assets * Market to book	0.000	-0.001	0.001 *	0.000	0.115 ***	-0.021
	(0.831)	(0.149)	(0.067)	(0.368)	(0.005)	(0.399)
Switcher			2.619 ***	3.006 ***		
			(0.000)	(0.000)		
Domestic lead bank	-0.319	-0.282	-0.451 ***	-0.553 ***	-0.507 ***	-0.659 ***
	(0.100)	(0.343)	(0.000)	(0.002)	(0.003)	(0.003)
Bank reputation	0.033 ***	0.061 ***	0.037 ***	0.065 ***	0.024 **	0.057 ***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.010)	(0.000)
Number of banks	0.051 ***	0.044 ***	0.035 ***	0.034 ***	0.006	0.025 *
	(0.000)	(0.000)	(0.000)	(0.000)	(0.617)	(0.071)
Country rating	0.027	-0.026	0.000	-0.035	-0.040	-0.088
	(0.296)	(0.612)	(0.988)	(0.429)	(0.236)	(0.168)
Financial crisis	1.951 ***	0.532	1.071 ***	0.485	0.637	0.135
	(0.000)	(0.345)	(0.000)	(0.188)	(0.120)	(0.804)
Sovereign crisis	1.473 ***	0.533 *	0.331 **	-0.158	-0.417 **	-0.670 **
	(0.000)	(0.083)	(0.033)	(0.432)	(0.037)	(0.015)
Volatility	-0.029 **	0.017	-0.020 **	0.008	-0.015	0.003
	(0.035)	(0.247)	(0.016)	(0.406)	(0.141)	(0.812)
5YrTB-3mTB	-0.009 ***	-0.007 ***	-0.005 ***	-0.003 **	-0.002	-0.001
	(0.000)	(0.010)	(0.000)	(0.032)	(0.206)	(0.759)
Industry fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Country fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Number of observations	15,499	13,587	17,171	14,681	1,672	1,094
PF deals	*289*	*113*	*775*	*356*	*486*	*243*
CF deals	*15,210*	*13,474*	*16,396*	*14,325*	*1,186*	*851*
Wald statistic	669 ***	431 ***	1,167 ***	683 ***	302 ***	171 ***
Correct predictions (%)	94.89	90.11	97.01	96.47	91.20	92.09
Max rescaled R-Squared	0.593	0.502	0.648	0.623	0.598	0.606

Table 11: Determinants of debt choice: switchers and matched samples

This table presents the results of logistic regressions which predict firms' choice between PF and CF. The dependent variable equals 1 when a switcher selects PF and 0 when it chooses a CF. Models [20] to [23] include firms that closed deals extended to switchers only, while models [24] and [25] were estimated for a matched sample of 1,216 syndicated deals (608 PF and CF deals). To create a matched sample of firms that use CF, we employ a propensity score matching (PSM) approach, by creating a 1 to 1 matching algorithm that captures the most identical deal in the same year and industry, using the following characteristics: deal size and WAM. For each independent variable, the first row reports the estimated coefficient and the second row reports the *p*-value. Standard errors are heteroskedasticity robust and clustered at the firm-year level. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. For a definition of the variables, see Table 3.

Dependent variable:	PF deal = 1, CF deal = 0					
Choice of debt	[20] Switchers | Core industries	[21] Switchers | Utilities	[22] Switchers | Core industries	[23] Switchers | Core industries	[24] Matched sample	[25] Matched sample
Independent variables:						
Intercept	-10.124 ***	-16.813 ***	-10.769 ***	-10.429 *	-4.210 ***	-3.825 ***
	(0.003)	(0.000)	(0.004)	(0.078)	(0.000)	(0.001)
Log total assets	0.695 ***	1.140 ***	0.705 ***	0.678 *	0.212 ***	0.245 ***
	(0.001)	(0.000)	(0.002)	(0.055)	(0.000)	(0.000)
Debt to total assets	0.225	2.045 ***	0.522	1.457 *	-0.702	2.489
	(0.632)	(0.007)	(0.290)	(0.066)	(0.108)	(0.238)
Market to book	0.004	0.329 ***	0.005	0.083 ***	0.094 **	0.124 **
	(0.735)	(0.005)	(0.695)	(0.008)	(0.023)	(0.030)
Return on assets	-1.383 **	-3.533 **	-1.506 **	-1.872 **	-2.986 **	-4.305 ***
	(0.020)	(0.017)	(0.020)	(0.024)	(0.015)	(0.008)
Fixed assets to total assets	-0.494	-0.985	-0.432	-1.026 **	0.476	1.080 **
	(0.123)	(0.116)	(0.214)	(0.023)	(0.129)	(0.012)
Former lender	-1.368 ***	-2.062 ***	-1.395 ***	-1.525 ***	-1.762 ***	-2.025 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log deal size	1.412 **	2.612 ***	1.506 **	1.527		
	(0.013)	(0.001)	(0.015)	(0.137)		
WAM	0.305 ***	0.317 ***	0.315 ***	0.325 ***		
	(0.00)	(0.000)	(0.00)	(0.000)		
Log total assets * Log deal size	-0.117 ***	-0.198 ***	-0.121 ***	-0.121 **		
	(0.001)	(0.000)	(0.001)	(0.047)		
Debt to total assets * Market to book	-0.009	0.470 ***	-0.010	0.171 ***	0.120 **	0.157 **
	(0.698)	(0.004)	(0.662)	(0.007)	(0.020)	(0.031)
Free cash flow to total assets			0.479			
			(0.773)			
EPS surprise				0.006 **		
				(0.050)		
Log Z-score						-0.519 ***
						(0.003)
Switcher					2.780 ***	2.715 ***
					(0.000)	(0.000)
Domestic lead bank	-0.560 ***	-0.511 **	-0.556 ***	-0.468 **	-0.359 **	-0.351 *
	(0.001)	(0.039)	(0.002)	(0.030)	(0.023)	(0.064)
Bank reputation	0.037 ***	0.013	0.038 ***	0.025 **	0.030 ***	0.033 ***
	(0.000)	(0.320)	(0.000)	(0.042)	(0.001)	(0.001)
Number of banks	0.031 ***	0.026	0.034 ***	0.031 *	0.040 **	0.072 ***
	(0.007)	(0.159)	(0.009)	(0.060)	(0.027)	(0.003)
Country rating	-0.068	-0.054	-0.088 **	-0.076	0.005	0.004
	(0.649)	(0.413)	(0.033)	(0.133)	(0.866)	(0.902)
Financial crisis	0.617	1.637 **	0.774 *	0.689	0.840 **	1.440 ***
	(0.135)	(0.022)	(0.075)	(0.187)	(0.044)	(0.002)
Sovereign crisis	-0.351 *	0.268	-0.256	-0.444 *	0.519 ***	0.606 ***
	(0.078)	(0.386)	(0.235)	(0.077)	(0.006)	(0.007)
Volatility	-0.014	-0.027 *	-0.017	-0.013	0.001	-0.020
	(0.164)	(0.078)	(0.107)	(0.330)	(0.957)	(0.144)
5YrTB-3mTB	-0.002	-0.005 *	-0.003	-0.001	-0.004 **	-0.005 **
	(0.340)	(0.061)	(0.115)	(0.585)	(0.023)	(0.010)

(Continued)

Dependent variable:	PF deal = 1, CF deal = 0					
Choice of debt	[20] Switchers | Core industries	[21] Switchers | Utilities	[22] Switchers | Core industries	[23] Switchers | Core industries	[24] Matched sample	[25] Matched sample
Independent variables:						
Industry fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Country fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Number of observations	1,618	873	1,508	1,200	1,216	944
PF deals	*491*	*293*	*406*	*340*	*608*	*472*
CF deals	*1,127*	*580*	*1,102*	*860*	*608*	*472*
Wald statistic	329 ***	201 ***	281 ***	236 ***	271 ***	217 ***
Correct predictions (%)	90.86	94.42	91.00	92.75	88.30	89.99
Max rescaled R-Squared	0.600	0.702	0.591	0.644	0.534	0.588

(continued)

Appendix A

Top 10 switchers from PF and CF deals in the 2000-2020 period

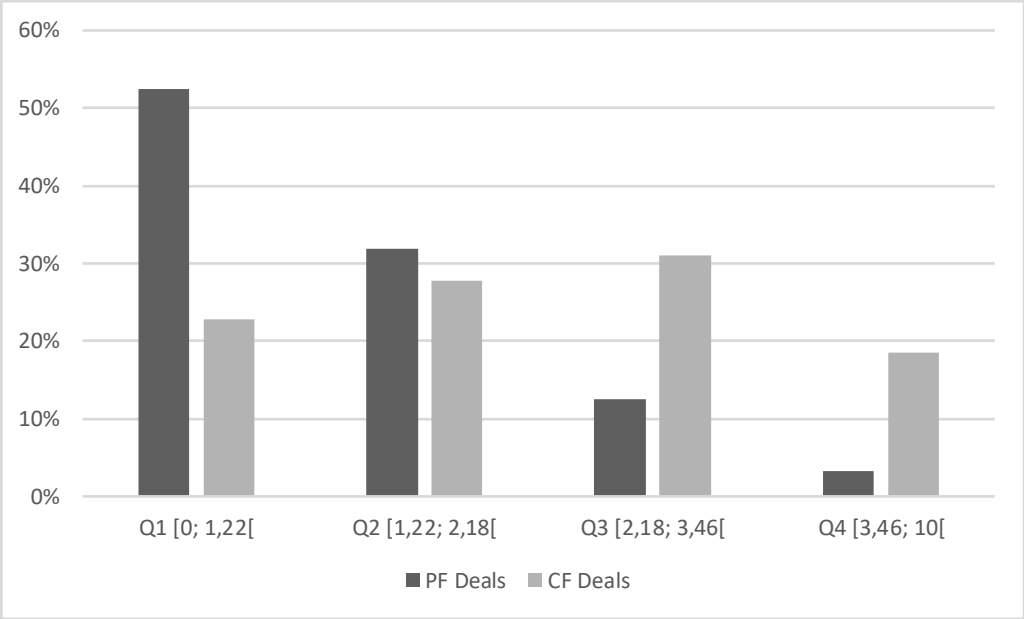
This table presents the top 10 switchers, firms with accounting and market data available that close both PF and CF deals in OECD countries, during the 2000–2020 period.

Firm	**Industry**	**Number of switches**	**Number of PF deals**	**PF deals amount [$ Million]**	**Number of CF deals**	**CF deals amount [$ Million]**
Électricité de France, S.A.	Utilities	22	31	8,551.15	16	15,422.11
Fomento de Construcciones y Contratas, S.A.	Construction/Heavy Engineering	17	17	3,674.69	31	23,667.91
Hochtief Aktiengesellschaft	Transportation	15	10	7,646.58	17	16,625.97
Actividades de Construcción y Servicios, S.A.	Construction/Heavy Engineering	14	28	9,066.89	14	10,788.50
Ferrovial, S.A.	Construction/Heavy Engineering	12	9	3,769.99	11	13,264.32
Acciona, S.A.	Construction/Heavy Engineering	8	23	7,783.59	13	16,193.14
Enel, SpA	Utilities	8	11	4,794.53	24	14,877.33
Sacyr Vallehermoso, S.A.	Construction/Heavy Engineering	8	14	3,864.39	7	7,745.74
Elecnor, S.A.	Services - Capital intensive	8	7	2,565.01	10	4,097.12
NRG Energy, Inc.	Utilities	7	7	1,328.43	11	24,958.50

Appendix B

Percentage of firms by Z-score

This figure reports the percentage of firms per Z-score. All firms are grouped per quartile. The Z-score is for the closest fiscal year end in the period [–395 days to +30 days]. We use Altman's (1993) Z-score, calculated as Z= 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings Before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Liabilities) + 0.999 (Net Sales/Total Assets).



Appendix C

Fomento de Construcciones y Contratas, S.A.: deals and accounting and market data

This table presents information for deals closed by Fomento de Construcciones y Contratas, S.A. in the 2005-2006 period, as well as accounting and market data in the year prior to the closing of a syndicated deal. For a definition of the variables, see Table 3.

Year	**2005**	**2006**	**2007**
Project Financing			
Nr. of deals	-	-	1
Average deal size ($ million)	-	-	102.17
Average WAS (bps)	-	-	110.00
Average WAM (years)	-	-	16.83
Corporate Financing			
Nr. of deals	-	1	2
Average deal size ($ million)	-	218.81	601.66
Average WAS (bps)	-	40.00	66.25
Average WAM (years)	-	2.00	4.91
Total assets [T-1] ($ million)	10,231,459	10,053,414	24,784,887
Fixed assets to total assets [T-1]	24.53%	25.44%	35.68%
Debt to total assets [T-1]	13.76%	19.15%	39.67%
Market to book [T-1]	278.26%	351.43%	666.69%
Return on assets [T-1]	6.05%	5.91%	4.77%
Z-score [T-1]	1.907	1.971	1.134