Financial Management

Arranger Certification in Project Finance

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Using a sample of 4,122 project finance loans worth $769 billion arranged from 1991 to 2005, we demonstrate that certification by prestigious lead arranging banks creates economic value by reducing overall loan spreads compared to loans arranged by less prestigious arrangers. Banks participating in these loan syndicates, rather than the project sponsors, pay for this certification. They do so by allowing top tier arrangers to keep larger fractions of the upfront arranging fees. Results are robust to the correction for the endogenous choice of loans by prestigious arrangers and indicate that certification is even more valuable during periods of extreme financial stress.

Few ideas resonate as succinctly with financial economists as the notion that financial intermediaries can provide valuable certification for an unknown security issuer in new issues markets where information is asymmetrically distributed. While the empirical evidence regarding certification in the finance literature generally supports this contention, some of the evidence is less than fully comparable. First, it is unclear in which new issues markets (securities or banking) certification can be most effective and how certification should express itself. Should it be as a higher price paid by investors for new securities or as a more accurate price reflecting all inside information? Additionally, evidence is mixed concerning which party can best provide certification: an objective third party with no economic interest in the issuing firm like an auditor (Dichev and Skinner, 2002; Rauterkus and Song, 2005), a rating agency (Sufi, 2007), a security underwriter (Blackwell, Marr, and Spivey, 1990; Puri, 1999; Roten and Mullineaux, 2002; Cooney,

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Kato, and Schallheim, 2003; Schenone, 2004; Fang, 2005) or a stake-holding corporate insider such as a venture capitalist (Megginson and Weiss, 1991; Lee and Wahal, 2004; Chemmanur and Loutskina, 2006) or a relationship bank (Bharath et al., 2007). Moreover, two final questions remain unresolved: 1) how certifying agents will be compensated for providing their services and 2) by whom. Will they be paid directly, with a higher underwriting spread or arranger fee, or indirectly through increased market share, and will payment be made by the issuing firm or by other members of the underwriting syndicate?

In this paper, we empirically investigate these questions by examining how certification is expressed and paid for in a large sample of syndicated project finance (PF) loans arranged from 1991 to 2005. PF loans are granted to fund large, complex, capital intensive, stand-alone, newly established investments with no past operating history. Such projects have extremely high upfront costs, but then generate large free cash flow streams after the project is completed (Bolton and Scharfstein, 1996; Esty and Megginson, 2003). Information asymmetries are also high (Shah and Thakor, 1987), so the importance of certification by a reputable bank should be particularly valuable when compared to other corporate finance deals.

While a large body of theoretical and empirical evidence regarding certification in new issues markets exists and is well summarized by Drucker and Puri (2007) who find that financial intermediaries can provide economically valuable certification to securities issuers, to the best of our knowledge no study has yet investigated the certification of PF loans by lead arranging banks. The theoretical motivation for certification by financial intermediaries draws on work by Leland and Pyle (1977), Fama (1985), Booth and Smith (1986), and Diamond (1991), all of whom predict that a financial intermediary can garner information about a firm through an existing borrowing relationship, which the intermediary can then use to credibly assert that offering prices for risky assets reflect potentially adverse private information. In this sense, lead arranging banks of syndicated loans serve as delegated monitors (Diamond, 1984), with the power and duty to screen out potential borrowers with adverse information before a loan is arranged and then ameliorate moral hazard problems through ongoing monitoring of borrowers after the loan closes.

Many researchers have searched for evidence of certification by investment and commercial banks in the security issuance processes with most supporting the proposition that highly reputable banks can and do certify that issue prices reflect all material adverse information. Many of these studies demonstrate that commercial banks are especially trusted certifying agents because of their inside knowledge about the issuing firm resulting from a pre-existing lending relationship.

While these studies explain certification as an application of the inside knowledge of the certifying agents obtained through prior transactions with the issuer, this argument is probably not valid for PF. By its very nature, PF involves a newly established project that is operationally separate from the sponsoring firm(s). In PF, the ability to certify arises from the superior ability of the arranging bank to structure and screen the deal set up by the sponsors, as well as to later monitor the loan contract or resolve financial distress situations.

An additional reason to examine PF is that we are able to overcome two issues inherent in the current empirical evidence on certification. Existing studies on other financing events suffer from the "commingling effect," the difficulty in separating certification effects from other influences (particularly market power), and the "incomplete effects" problem of identifying all possible spill-over and unmeasured wealth effects occurring outside the financing event being studied. The latter implies that even if certification occurs and is valuable, there may be important positive or negative spill-over effects not observed during the issue process itself. As a positive example of this, Duarte-Silva (2007) confirms that when a firm planning a seasoned equity offering signs with an unexpectedly prestigious underwriter, its stock price reacts positively on the announcement and

the stock's bid-ask spread falls significantly thereafter. On the negative side, Ng and Smith (1996) find that underwriters often require issuing firms to offer warrants as compensation for accepting underwriting risk. In both cases, the costs and benefits of employing a prestigious underwriter will not be fully measured by examining a security sale itself. In contrast, commingling and incomplete effects are less of an issue in PF. In fact, PF loans are fully self-contained, one time financing events, where the previous lending relationships between the arranging bank and the project sponsors are far less important than the soundness of the stand-alone project to be financed.[1] No shares of the project company trade before or after the funding event, and so much more of the relevant pricing variables can be measured than is true for other types of security issues. This is true for no other corporate financing sample and PF loans are, in this sense, an ideal sample to test for certification. However, we also must recognize that PF is more complex than is traditional corporate lending as it is based on a complex network of contracts (Corielli, Gatti, and Steffanoni, 2010). This higher degree of complexity makes it more difficult to obtain clear testable predictions, especially when we can only employ noisy control variables to proxy for some of these complexities. In essence, we face a trade-off between the "commingling/incomplete effects" that plague previous studies regarding non-PF financing and the added complexity and inability to adequately control for all of these different types of complexity of PF loans.

We examine lead arranger certification in PF loan syndications in three ways. First, we test whether certification by prestigious arrangers will allow loans to be arranged for lower spreads than would be required for less prestigious arrangers. Additionally, we evaluate how prestigious arrangers are compensated for their services and for use of their reputational capital. Furthermore, we examine who pays, the borrower who signals its better quality by paying higher fees or the banks invited to join the syndicate, for any certification identified. Our results indicate that, ceteris paribus, spreads are significantly lower for loans arranged by prestigious banks. Prestigious arrangers charge overall fees that are no higher than those charged by arranging banks with lower market shares. In fact, there is some evidence that overall fees are actually lower for top banks. This means prestigious banks can arrange syndicated PF loans at economically and statistically significantly lower costs than less prestigious arrangers. Finally, we demonstrate that banks participating in syndicates arranged by prestigious banks, rather than the project sponsors, actually pay for prestigious arranger certification. While allowing more prestigious arrangers to charge higher arranger upfront fees, participating banks themselves accept constant, possibly even lower, nonarranger upfront fees.

Our paper contributes to the existing literature on certification in many ways. We are the first to investigate certification in PF lending, so we fill a gap in the existing understanding of PF in specific and on certification more generally. Any documented certification effect in PF indicates the value of the certifying agent's ability to screen the soundness of the project and of the underlying network of contracts rather than the agent's ex ante inside information about borrowers. That is far less important due to the nonrecourse nature of PF loans. If certification ability is

[1] To analyze whether past relationships between lead arrangers and sponsors on prior project finance loans affect spreads and fees, we test the results reported in Sections IV and V for robustness. We replicate Table IV of the paper, but add a proxy that measures the past lending relationship between the sponsors and the lead arrangers. We consider past lending relationships between any of the sponsors and any of the lead arrangers in the overall syndicated loans market. We measure lending volume as the natural logarithm of the total deal size of the loans given in millions of real 2005 US dollars. In the case of no prior lending volume, we use the loan volume which is slightly smaller than the minimum non-zero lending volume. We consider prior lending over different time horizons from one-three years. In contrast to our main sample of 2,480 tranche-level observations in the spread regressions and 694 deal-level observations in the fee regressions used in Table IV, we only have information on sponsors for 525 tranche-level and 183 deal-level observations, respectively. We find that the proxy for a prior relationship between sponsors and lead arrangers is insignificant, while our results for arranger prestige are robust. Results are available upon request.

valued in PF lending, it might very well also be valued in other financial transactions. How much of the currently documented certification effect in other areas is due to inside information and how much is due to certifying ability? Our results may shed light on the relevance of this question. Furthermore, we provide a clean test of certification in the absence of the commingling and incomplete effects problems.

The rest of the paper is organized as follows. Section I surveys the relevant PF literature and develops our valuable certification (VCH) and direct compensation hypotheses (DCH). Section II presents our sample selection strategy, characterizes the final sample of PF loans, and describes the methodology we employ to test for certification. Section III provides our empirical tests of the VCH's predictions regarding the impact of lead arranger prestige on loan spreads. Section IV empirically examines the structure of upfront fees (overall, arranger, and nonarranger fees) and in this way tests the predictions of the DCH. Section V verifies our basic findings after adjusting for endogeneity in the choice of projects by prestigious lead arrangers. Section VI investigates the validity of our loan spread and fee results during banking crisis periods, while Section VII provides our conclusions.

I. Institutional Background and Testable Hypotheses

Esty and Sesia (2007) define PF as "the creation of a legally independent project company financed with equity from one or more sponsoring firms and nonrecourse debt for the purpose of investing in a capital asset." These are inherently complex projects with large risks and substantial informational asymmetries (Shah and Thakor, 1987). Yet these projects are funded with small amounts of private equity contributions and much larger amounts of nonrecourse syndicated loans, which are the principal external, capital-market financing. The banks that arrange these credits emerge as insiders to the project by working with the PF vehicle company's shareholders (known as project sponsors), and then must arrange the bulk of the external financing by attracting other banks to become members of a loan syndicate. PF is an economically significant and growing financial market, worthy of empirical analysis in its own right. Esty and Sesia (2007) report that a record $328 billion in PF funding was arranged in 2006, up from a cyclical low of $165 billion in 2003 and substantially above the previous record of $217 billion in 2001. PF has also been gaining global financing market share over the past two decades, especially as a vehicle for channeling development capital to emerging markets. Over 60% of the value (and 68% of number) of loans in our sample are arranged for borrowers located outside of North America and Western Europe, with over 40% of the total being arranged for Asian projects. In spite of its importance, only a few theoretical (Shah and Thakor, 1987; Berkovitch and Kim, 1990; John and John, 1991; Chemmanur and John, 1996), descriptive (Kensinger and Martin, 1988; Brealey, Cooper, and Habib, 1996; Kleimeier and Megginson, 2000; Esty, 2001), and empirical PF studies (Esty and Megginson, 2003; Sorge, 2004; Dailami and Hauswald, 2007; Corielli et al., 2010; Hainz and Kleimeier, 2012) have thus far been published.

The creation of a Special Purpose Vehicle company is the initial step in all project financings. However, given the high debt/equity ratio used, the work of the syndicated loan lead arranging bank (also known as Mandated Lead Arranger (MLA)) is arguably the most crucial. The bank selected by the project sponsors must perform three vital and difficult tasks.

First, it must conduct due diligence on the vehicle company and the project itself. This is especially difficult as the project company has no prior operating history. The arranging bank has access to specialist engineering, legal, financial, logistical, market assessment, and risk assessment skills that allow the bank to effectively certify a project's true potential and to ensure

that relevant adverse inside information is revealed prior to loan syndication. Sponsors seek a bank that can successfully syndicate the PF loan. This requires both distribution capability and certification of the project's quality and risk. Alternatively, a bank's distribution abilities are highly correlated with its size, the geographic sweep of its network, and its ability to attract local banks to the loan syndicate. This should be particularly important for PF loans since local banks bring not only local knowledge and ties, but also serve as a political bond to help ensure that a host government will not interfere in a project's evolution (Mian, 2006). On the other hand, the MLA's ability to certify the project's quality requires extensive knowledge of the industry where the project operates and an ability to coordinate the work of all the consultants (engineers, auditors, and lawyers) working simultaneously on the project.

Next, the lead arranger is responsible for the organization of the bank syndicate and must be able to attract a sufficient number and diversity of participating banks to fund the PF loan at a price that is both low enough to ensure project solvency and high enough to adequately compensate the banks for the risks they are taking by extending credit. The lead arranger must also design an optimal loan syndicate (Pichler and Wilhelm, 2001; Lee and Mullineaux, 2004; Focarelli, Pozzolo, and Casolaro, 2008; Sufi, 2007; Ball, Bushman, and Vasvari; 2008) that will deter strategic defaults (Chowdry, 1991; Esty and Megginson, 2003), but allow for efficient renegotiation in the event of liquidity defaults.

Finally, the lead arranger develops a meticulous system of rules and covenants in cooperation with the lawyers, managed by the agent bank of the syndicate, to constantly monitor the vehicle company's actions after the loan closing and throughout the life of the loan itself. This is particularly challenging in PF since many such projects have extremely high upfront costs, but then generate large free cash flow streams after the project is completed (Bolton and Scharfstein, 1996; Esty and Megginson, 2003). Furthermore, the lenders, legally represented by the agent bank of the syndicate, typically have little or no power to seize assets or shut down project operations in host countries, so deterrence must be expressed through some other mechanism (Repullo and Suarez, 1998). In spite of these complexities, Kleimeier and Megginson (2000) find that PF loans have lower spreads than many other types of syndicated loans, despite their being riskier nonrecourse credits with longer maturities, suggesting that the unique contractual features of PF and the underlying risk management process in fact reduce default risk.

While, to some extent, all PF loans benefit from the certification of the respective arranging banks, if certification by more prestigious lead arranging banks can reduce the cost of arranging a particular financial transaction, then projects certified by these intermediaries will have lower overall financing costs than will projects arranged by less prestigious banks. Alternatively, certification might allow a project to be implemented/funded that would not be funded without aid from a highly prestigious agent. Therefore, in an environment characterized by asymmetric information between project sponsors and capital providers, certification will create economic value by minimizing search and information costs. Absent certification of project value by a trusted intermediary, each potential lender will feel compelled to independently analyze the project's value and cash flows. If project size or a desire for risk diversification prevents a single lender from financing the entire project, this need for individual project assessment will mean duplication of search efforts by two creditors, tripling of effort by three, quadrupling by four, etc. At the very least, this multiplication of effort will raise the cost of arranging project funding since a loan must be priced to cover all banks' search costs; at worst, it will cause the project to fail as search costs become excessive.

We create a two part test to see whether certification works and how prestigious arranging banks are compensated for providing this service. As a basis for this test, we need to establish a measure of prestige. Using a methodology similar to that employed in Megginson and Weiss

(1991), Carter, Dark, and Singh (1998), Sufi (2007), and Dong, Michel, and Pandes (2011), we compute an arranger's market share in the PF market in the years prior to the arrangement of the PF loan and use this measure as an indicator of the arranger's prestige. To the best of our knowledge, our paper is the first that adapts this indicator to the specific characteristics of the PF market, as explained later in Section II.C.

Using this prestige proxy, we test two hypotheses. First, the VCH predicts that certification by prestigious arrangers will create economic value by allowing a loan to be arranged for a lower spread than would be required for a less prestigious arranger. Specifically, once we control for other factors, loans arranged by prestigious banks should have lower spreads over benchmark lending rates such as LIBOR or Euribor. If we find that loan spreads are no different for loans arranged by banks with high versus low market shares, this will indicate that certification does not occur in PF lending or that it occurs, but the market is so competitive that no premiums are created. A finding that prestigious banks charge higher loan spreads than do banks with low arranger market share would suggest that prestigious banks enjoy sufficient market power that they can charge borrowers a premium for their loan arranging services. Fang (2005) finds this to be true for initial public offerings (IPOs) underwriting and McCahery and Schwienbacher (2008) document the same for the general syndicated loan market.

As the second part of our test, we ask how and by whom certifying agents (bank arrangers) are compensated for providing certification for PF projects. We propose the DCH that asserts that certifying agents will be compensated by a direct form of payment. In our PF loan sample, this compensation takes the form of a higher arranging fees being paid to top tier PF loan arrangers than to less prestigious arrangers in otherwise similar projects. After adjusting for all other relevant factors, "certified projects" should have lower overall funding costs than "noncertified" projects, but the fees for the arranger should be higher indicating that the arranger fee is where surplus is captured by the prestigious lead arranger.[2]

II. Data and Methodology

We employ a merged sample of PF syndicated loans signed from January 1, 1991 to December 31, 2005 drawn from the Reuters/Loan Pricing Corporation's Dealscan database and the Project-Ware database. While Dealscan has been employed in many empirical syndicated loan studies (Dennis and Mullineaux, 2000; Althunbaş and Gadanecz, 2004; Ivashina et al., 2009; Qian and Strahan, 2007; Sufi, 2007; Bae and Goyal, 2009), the only study employing ProjectWare that we know of is Corielli et al. (2010). Ours is the first study to employ both databases, and we do this because each provides valuable information the other lacks. While Dealscan provides very detailed information about the syndicate structure and the pricing of loans, both in terms of spread and fees, ProjectWare has particularly rich data regarding the financial structure of projects, especially project debt-to-equity ratios, and provides information about key contracts that the PF vehicle company sets up to design, build, and manage a venture.

A PF loan typically consists of several tranches that fund the same project, so we focus on the loan tranche as our starting unit of observation. We collect detailed information about each

[2] An alternative explanation of our DCH could be that a prestigious lead arranger may get a larger proportion of the fee simply because it retains a larger share of a loan tranche than that retained by a non-prestigious lead arranger in a comparable deal. We run an additional set of regressions to test the robustness of results included in Section IV and find that lead arrangers who jointly fund a large fraction of the loan do not charge higher fees. The sample size for this analysis is reduced to 420 deals. Consequently, the coefficients of lead arranger prestige are still generally robust, but less significant for arranger fees. Results are available upon request.

tranche including its size, currency, spread, maturity, signing date, financial and operational risk (existence of guarantees or ratings, the existence of general and financial covenants), number and identity of bank arrangers and syndicate members, and syndicate structure. As reported in Table in Appendix A, banks are considered lead arrangers when they are listed in Dealscan's field "Lead Arranger." We also collect project-related variables including measures of institutional risk (country risk and creditor rights' protection in the project's host country), industry risk, and vehicle company structure, as well as equity contributions and, where available, project covenants and sponsor information. All our proxies, except those describing the project's home country and the vehicle company structure, are obtained from Dealscan. Based on the borrower's name, host country, sponsor's name, and the year of loan signing, we identify those projects that are also reported in the ProjectWare database and add the vehicle company structure proxies to each matched loan tranche observation in our sample. Overall, we obtain a sample of 4,122 loan tranches from Dealscan, of which 472 can be matched with ProjectWare. Our variables are explained in detail in Appendix A.

The 4,122 loan tranches included in our sample fund 2,649 different projects; 1,765 of those deals consist of a single tranche, while the remaining 884 deals consist of 2-11 individual tranches with an average of 2.67 tranches per deal.[3] To analyze the VCH, we examine the spread paid on a specific loan tranche. Loan tranches differ in terms of currency, maturity, size, and loan types. Moreover, the pricing of PF loans is tranche-specific (every tranche has its own spread). Thus, our spread analyses are based on a sample of 2,480 tranches for which we have full information on all dependent and independent variables. In contrast, for our analysis of the DCH, fees are deal-specific such that the same fees apply to all tranches financing the same deal. We have fee information on 754 deals reflecting 1,376 different tranches including 343 multiple tranche deals with an average of 2.79 tranches per deal. Finally, our main fee analyses are based on a sample of 694 deals for which we have full information on all dependent and independent variables. For the deal-level analysis of the DCH, we need to aggregate our tranche characteristics to the deal level. For those numeric tranche characteristics, such as size or maturity which differ across tranches, we calculate the average across all tranches belonging to the same deal. For those tranche characteristics such as currency risk, guarantees, or covenants that are measured as dummies and differ across tranches, we set the dummy equal to one if at least one of the tranches has a dummy equal to one.

A. Loan and Project Characteristics

Table I presents summary information about our sample. Panel A details the loans' characteristics, while Panel B describes the geographic distribution of the loans. The values are reassuringly similar to those reported in other empirical PF loan studies including Kleimeier and Megginson (2000), Esty and Megginson (2003), Hainz and Kleimeier (2012), Sorge and Gadanecz (2008), and Corielli et al. (2010). The average (median) loan tranche size is $188.98 million ($79.45 million) in 2005 US dollars, and the mean spread is 169.2 basis points (bp) (140.0 bp) above the base lending rate, which is typically LIBOR. There is great variability in both size and spread with loan sizes ranging between $380,000 and $21.59 billion, and spreads ranging

[3] Maskara (2009) studies the risk and pricing of syndicated loans with single versus multiple tranches. He argues that riskier borrowers are more likely to obtain tranched loans with higher average spreads than less risky borrowers (who get single tranche loans with lower spreads). We test the robustness of our results by adding a dummy in the regressions included in Panel A of Table IV set to one for loan tranches belonging to deals with multiple tranches and zero otherwise. Results indicate that the multiple tranche dummy is not statistically significant and that our results for lead arranger prestige are robust. Results are available upon request.

Table I. Descriptive Statistics for the Project Finance Loan Sample, 1991-2005

For a definition of the variables see table in Appendix A.

Panel A. Descriptive Statistics for the Full Sample

	% of Total Sample	Mean	Median	Standard Deviation	Minimum	Maximum	Number of Observations
Loan Characteristics							
tranche size ($m real)		188.98	79.45	498.38	0.38	21, 587.40	4,067
tranche spread (in bp over base-rate)		169.18	140.00	131.18	–295.00	1, 400.00	2,635
deal's total upfront fee (maximum, in bp)		67.27	60.00	49.10	0.00	405.00	754
deal's arranger upfront fee (maximum, in bp)		17.86	0.00	38.35	0.00	250.00	754
deal's non-arranger upfront fee (maximum, in bp)		60.31	50.00	48.30	0.00	405.00	754
tranche maturity (in months)		104.71	84.00	80.76	2.00	2, 352.00	3,557
tranche rating		12.25	13.00	4.30	1.00	25.00	236
tranches with guarantee	18.17						4,122
tranches with currency risk	47.06						4,122
secured tranches	29.79						4,122
tranches with general covenants	3.93						4,122
tranches with financial covenants	15.87						4,122
year of loan signing		2000	2000	3.53	1991	2005	4,122
number of lenders in tranche		7.48	5.00	7.87	1.00	62.00	4,122
number of lead arrangers in tranche		2.13	1.00	2.30	1.00	36.00	4,122
average market share of all lead arrangers (in %)							
prior year		1.47	0.99	1.69	0.00	18.11	4,122
prior 3 years		1.43	0.98	1.48	0.00	9.24	4,122
prior 5 years		1.40	0.94	1.54	0.00	12.78	4,099
Project Characteristics							
deal size ($m real)		407.70	174.03	1, 918.40	0.59	81, 078.45	4,111
country risk		76.53	80.65	17.47	24.32	100.00	4,100
creditor rights		2.05	2.00	1.06	0.00	4.00	4,122
leverage (debt-to-equity ratio)		3.41	2.59	2.56	0.11	14.71	187
tranches in projects with risk management contracts							472

(*Continued*)

Table I. Descriptive Statistics for the Project Finance Loan Sample, 1991-2005 (*Continued*)

Panel A. Descriptive Statistics for the Full Sample

	% of Total Sample	Mean	Median	Standard Deviation	Minimum	Maximum	Number of Observations
construction contract	15.47						
EPC construction contract	32.84						
off-take contract	22.88						
supply contract	18.64						
equipment contract	18.22						
O&M contract	11.02						
number of contracts		1.19	1.00	1.32	0.00	5.00	472
tranches in projects where sponsors are SPV counterparties	19.49						4,122
tranches in projects in major industry group							4,122
banks & financial services	1.63						
corporate	58.20						
government	3.30						
media & communication	3.66						
utilities	19.87						
unknown	13.34						
tranches in projects signed during or after banking crisis							4,122
$crisis_{D,t=0to1}$	7.69						
$crisis_{D,t=0to2}$	9.12						
$crisis_{D,t=0to3}$	11.48						

(*Continued*)

Table I. Descriptive Statistics for the Project Finance Loan Sample, 1991-2005 (*Continued*)

Panel B. Regional Distribution of Project Finance

Region Country	Number of Tranches	Real Tranche Size in US $m			Year of Loan Signing			% of Global PF Volume
		Total	Mean	Median	Minimum	Median	Maximum	
Asia	2,036	317,374.7	159.6	62.4	1991	1998	2005	41.3%
Taiwan	262	55,916.3	231.1	64.0	1994	1999	2005	7.3%
Australia	253	38,939.0	155.1	75.1	1994	2001	2005	5.1%
China	254	38,370.7	151.7	46.8	1991	1997	2005	5.0%
Indonesia	242	32,022.1	133.4	58.2	1993	1997	2005	4.2%
North America	739	146,780.4	198.6	96.3	1991	2000	2005	19.1%
USA	700	136,595.2	195.1	94.2	1991	2000	2005	17.8%
Western Europe	588	130,380.1	222.9	97.8	1991	2003	2005	17.0%
United Kingdom	193	51,236.6	265.5	144.7	1991	2002	2005	6.7%
Spain	189	28,252.9	150.3	72.1	1993	2004	2005	3.7%
Middle East & Turkey	207	68,942.3	338.0	176.6	1992	2003	2005	9.0%
Saudi Arabia	27	17,981.0	666.0	502.7	1995	1997	2005	2.3%
Qatar	30	14,517.7	483.9	324.0	1996	2004	2005	1.9%
United Arab Emirates	23	12,020.4	546.4	456.0	1999	2004	2005	1.6%
Turkey	51	7,654.8	150.1	97.8	1992	2001	2005	1.0%
Eastern Europe	256	52,542.1	206.9	55.2	1995	2004	2005	6.8%
Russia	68	11,082.8	163.0	53.2	1995	2004	2005	1.4%
Latin America	227	42,132.9	185.6	115.0	1992	2002	2005	5.5%
Mexico	56	12,563.7	224.4	126.8	1998	2003	2005	1.6%
Brazil	46	8,898.5	193.4	106.1	1997	2002.5	2005	1.2%
Africa	54	8,711.1	161.3	132.5	1997	2003.5	2005	1.1%
Egypt	16	3,246.9	202.9	161.8	2000	2004	2005	0.4%
unknown	15	1,719.1	114.6	77.8	1993	1995	1996	0.2%
Global	**4,122**	**768,582.7**	**189.0**	**79.5**	**1991**	**2000**	**2005**	**100.0%**

from –295 bp (a discount to LIBOR) to 1,400 bp (a 14 percentage point premium). Fees are reported in three categories: 1) total upfront fees, which are the total amount of fees the borrower pays to the syndicate for organizing the loan facilities, 2) arranger upfront fees, the fraction of the total fees retained by the lead arranging bank(s), and 3) nonarranger upfront fees, which are distributed to participating banks in the loan syndicate. A complication in analyzing fees in syndicated loans, as described in Esty (2001), is that upfront fees tend to be "tiered." This means that their level depends upon the commitment amount of the lending banks. In a $100 million loan, for example, banks that provide up to $5 million receive a fee of 30 bp, banks that provide between $5 million and $10 million receive a fee of 60 bp, and banks that provide more than $10 million receive a fee of 80 bp. In all such cases, we are particularly careful in collecting data for our fee proxies from Dealscan's "tiered upfront fee" text field and only include fees when Dealscan provides detailed information. Among our 694 deals, there are 60, 374 and 444 deals with tiered arranger, nonarranger, and total upfront fees, respectively.

We measure each fee as the maximum bp among the tiered bp levels. However, in the case of tiered fees, this maximum fee proxy will overestimate the actual fee paid. Consider the tier structure example given above. We measure the upfront fee as a maximum of 80 bp. If the syndicate consists of six banks with each providing $10 million and two banks providing $20 million each, then the actual fee amounts to 68 bp and we overestimate fees by 12 bp. In contrast, if the syndicate consists of two banks with each providing $5 million, five banks with each providing $10 million, and two banks providing $20 million each, then the actual fee amounts to 65 bp and we over estimate fees by 15 bp. In the first example, the standard deviation across the different tiers of 60 and 80 bp is 14.1 bp, while in the latter case, the standard deviation across the different tiers of 30, 60, and 80 bp is 25.2 bp. A higher standard deviation across tiers is related to a higher level of over estimation in the maximum fee proxy. Thus, we use the standard deviation across tiers in our analysis to correct for any over estimation bias.[4] The average (median) total upfront fee is 67.3 bp (60.0 bp), the arranger upfront fee is on average 17.9 bp (0 bp), and the mean nonarranger upfront fee is 60.3 bp (50.0 bp).

The mean (median) loan maturity is 104.7 months (84 months) and the mean and median year of loan signing is 2000. These maturities are similar to those presented in Kleimeier and Megginson (2000), who document that PF loan maturities are much longer than those on other syndicated loans arranged for US or international borrowers, despite having higher average risk. Ratings for the 236 loans with S&P ratings indicate that PF loans are indeed risky credits. Our ratings proxy, ranging from one for AAA ratings to 28 for D ratings, has an average value of 12.3 (median of 13), corresponding to a rating of about BB-. 18% of all tranches are supported by third party guarantees and 47% of the loans have currency risk, where the currency of the project's cash flow differs from the currency of debt repayment, while 16% of the loans have financial covenants and between 11% and 33% have risk management contracts. Due to serious nonreporting biases, these values are definitely low estimates of the actual frequency of financial and risk management covenant usage. There are, on average, 7.5 banks (five banks) participating in each loan syndicate, while there are 2.1 lead arrangers (median of one) organizing the average loan.

The last section of Panel A presents summary data about the projects for which these loans are extended. The typical PF loan finances a project with an average (median) deal size of

[4] As additional robustness checks, we also consider the average, median, and minimum across all tiered fees as alternative fee proxies. These alternative proxies will also be biased for deals with tiered fees, but the bias, such as for the minimum fee proxy, will be of a different nature. The results in Tables IV-VI are, however, robust to these alternative specifications. We conclude that any measurement bias in the fee proxies does not influence our findings. Results are available upon request.

$407.7 million ($174.03 million). It is booked in a country with moderate risk, as measured by the *Euromoney* Country Risk Index, which assigns low risk developed countries index values near 100 and assigns extremely high risk countries values close to zero. Loans are extended to borrowers headquartered in countries with an average (median) country risk value of 76.53 (80.65). In addition to country risk, which primarily reflects the political risk and economic performance of a country, we also measure the quality of creditor rights in the country in which the project is located. An average project is located in a country with a La Porta et al. (1998) creditor rights score of two, reflecting only moderate creditor rights. These findings are in line with Tung and Subramanian (2009) and Hainz and Kleimeier (2012) who argue that PF is preferred to on-balance sheet syndicated loans when political and regulatory risks are relatively high and economic performance of the host country is relatively weak. In such circumstances, the limited recourse nature of PF provides incentives to lenders, especially multilateral development banks like the World Bank or national development banks, to actively manage the political risk of the project.

As shown in most other PF studies, the typical project is characterized by higher leverage than is observed for other corporate borrowers. On average (median), the debt-to-equity ratio of PF vehicle companies is 3.41 (2.59), reflecting a 77% (72%) debt-to-total capital ratio. As described by Corielli et al. (2010), PF involves heavily "leveraging up" capital intensive projects that, once built, generate large amounts of free cash flow. The commitment to payout this cash flow as debt service minimizes the temptation for sponsors and/or host country governments to preempt this cash flow for themselves. PF loans are subject to a wide set of loan covenants, and are secured loans collateralized by all project assets.

B. Geographic Distribution of PF Loans

Panel B of Table I indicates that US borrowers receive the single largest number (700) and value ($136.6 billion) of PF loans, but over 60% of our sample loans are extended to borrowers located outside of the developed economies of North America and Western Europe. Almost half (2,036 of 4,122 or 49.4%) of the total number and 41.3% ($317.4 billion of $768.6 billion) of the total value of all loans are extended to Asian borrowers with projects in Taiwan, Australia, China, and Indonesia all receiving between 242 and 262 loans, worth $32.0 billion to $55.9 billion. Western European borrowers are the third largest recipients of PF loans (588 loans worth $130.4 billion), after Asia and North America, with the United Kingdom and Spain receiving 193 and 189 loans, worth $51.2 billion and $28.3 billion, respectively. In terms of the number of loans received, Eastern Europe (256 loans, worth $52.5 billion) and Latin America (227 loans worth $42.1 billion) rank fourth and fifth, respectively, but the Middle East (including Turkey) ranks fourth in terms of total loan value (207 loans worth $68.9 billion). The reason for this is the extremely large average size of loans arranged for the two to three dozen petroleum-related projects in each of the Persian Gulf countries of Saudi Arabia (average of $666.0 million), Qatar ($483.9 million), and the United Arab Emirates ($546.4 million). A mere 54 loans, worth $8.7 billion, are extended to projects in Africa.[5]

[5] Since some of the loans included in our dataset are very large, it could be that if a bank takes the mandate as lead arranger for these deals, it can become "prestigious." In order to test the robustness of the results of Section IV to the exclusion of these very large loans, we run additional sets of regression analyses (not reported, but available upon request). Regarding spreads, our results are quite robust. More prestigious lead arrangers are able to arrange loans for lower spreads, regardless of whether prestige is measured using loan volume- or loan number-based market shares. Thus, in this instance, loan size does not affect the results. The results are also generally robust for arranger fees.

C. Measuring Arranging Bank Prestige

Our methodological contribution to the certification literature is the construction of two lead arranger "prestige" variables based on prior years' market share, until now unexamined in the PF literature. Though similar measures have been used in studies of syndicated loan (Sufi, 2007) and securities markets (Megginson and Weiss, 1991; Carter et al., 1998), this will be the first such application to PF lending. Most studies measure market shares based on the share of the loan that the arranger actually funds. This is appropriate in a setting where the larger size of the lending share reflects the arranger's stronger incentive to screen and monitor in order to extract inside information. In PF, however, we are mainly interested in the arranger's ability to structure complex deals. The market share based on the full size of the PF loan better reflects this ability, in line with Fang (2005) and McCahery and Schwienbacher (2008) who also base their high reputation dummies on such a definition of market share. Thus, for tranches with a single lead arranger, we calculate the lead arranger's market share in the PF loan market as the total dollar volume of arranged PF loans in percent of the total dollar volume of PF loans arranged by other lead arrangers in that year. For tranches with multiple lead arrangers, we average the market shares of each bank.

We compute market shares over one, three, and five year measurement periods prior to the signing date of each loan, thus ensuring against any look ahead bias in our prestige measure. These values are presented in Panel A of Table I. Lead arrangers have an average one-year market share of 1.47%. These values fall steadily over our measurement periods to 1.40% for the prior five years. Median share values are roughly two-thirds of the mean market shares, but show the same declining pattern over increasing measurement periods. We also measure bank prestige by using an alternative dummy variable, which is coded as one for prestigious lead arrangers and zero for nonprestigious lead arrangers. Prestigious arrangers are banks that have a market share which falls into the top 25% of the distribution of the respective market share proxy. Note that we establish this dummy for the full sample of 4,122 PF loan tranches for which we have lead arranger information. Thus, our high prestige dummy does not vary across samples, although it might be the case that a given lead arranger is considered prestigious based on one market share proxy, but not based on the other. As an illustration, consider a lead arranger that has a very high market share in just one year, but a very low market share in surrounding years. Such a lead arranger might be considered prestigious based on one-year prior market shares, but not based on three- or five-year prior market shares.[6,7]

[6] While in the next sections we present results based on the prior three years market share, we also check the robustness of the coefficients using prior one and five years' market share data. In addition to the average market share, we also calculate the total market share of all lead arrangers in one syndicate. This is again based on one, three, or five years of data. The coefficient for lead arranger market share is robust regarding its impact on spreads and arranger upfront fees. However, while the effects of the average lead arranger market share on non-arranger fees and total fees are significantly negative, the effects of the total lead arranger market share are mostly insignificant indicating that only individually prestigious arrangers can reduce these fees, but a larger group of only moderately prestigious arrangers cannot. Results are available upon request.

[7] In Section II, we argue that the lead arranger's certification ability stems from the fact that prestigious lead arrangers: 1) are experts in assessing the project's quality, 2) can arrange an "optimal" syndicate, and 3) can monitor the project well. Thus, we implicitly assume that our market share based prestige proxies reflect these abilities. In order to provide more tangible evidence for this assumption, we regress our main prestige proxies on a set of independent variables including measures for the arranger's certification ability. Appendix B presents our results. The tranche size to lender ratio is a proxy for factor (2). Its negative coefficient indicates that prestigious lead arrangers are indeed able to assemble a larger syndicate, thereby providing an enhanced risk-sharing role when compared to non-prestigious lead arrangers. The complexity of the project is a proxy for factor (3) as arranging and monitoring a multiple tranche deal is challenging and complex. Its positive coefficient supports our theoretical argument.

Table II summarizes our lead arranger market share proxies by presenting aggregated source data for those banks that most frequently serve as lead arrangers for PF loans. Over the entire 1987-2005 estimation period, more than 1,000 banks served as lead arrangers for PF loans. However, Table II only reports the aggregate loan volumes for the top 22 leading arrangers. We report market share data by bank group, so PF loans arranged by the headquarters office, an international branch, or a subsidiary of the same bank group are summed and treated as being arranged by that bank group. We also take mergers between banks into account and report the position of the merged bank overall (a list of bank groups and mergers is available upon request). All of the bank groups in Table II served as lead arrangers for at least $25 billion worth of loans (in real 2005 dollars), and the median bank on this list arranged 189 loans worth $57 billion over this 19-year period. Table II also presents median and average annual lead arranger market shares for 1987-2005. This is the basic measure on which our arranger prestige proxies are based. In particular, prior year market shares are specific to the year of loan signing so that bank mergers can properly be taken into account (Sapienza, 2002). Consider, for example, the merger between Deutsche Bank and Bankers Trust that took place in 1999. For a PF loan arranged by Deutsche Bank and signed before the merger, only the prior year's market share of Deutsche Bank will be considered. For a similar loan signed in 2000, however, the prior year's market shares of both banks should be added. Market shares of individual banks vary widely from year to year, so a multi-year rather than a single year market share proxy is preferable for this study.[8]

Closer examination of the lead arranger share data presented in Table II reveals two important details about the global PF loan market. First, leadership in loan underwriting is remarkably nonconcentrated and contestable. This contrasts with the highly concentrated nature of equity or corporate bond underwriting or the overall syndicated loan market, as documented by Fang (2005) and Cetorelli et al. (2007), respectively. The final row of Table II presents the sum of the market shares of the 22 banks listed. On average, these banks account for 60% or less of the total volume of PF loan tranches arranged. Furthermore, it is rare for any single arranging bank to achieve as much as a 5% market share for more than four consecutive years. Other league tables confirm this high level of contestability and nonconcentration. Thomson Reuters, for example, reports market shares ranging from 1.2% to 8.4% for the top 25 arrangers of global PF loans in the first half of 2006 and a mean (median) market share of 2.9% (2.6%) among these arrangers. In contrast to 2006, the market shares of these arrangers differed substantially in 2005, with ABN-Amro being one of the more dramatic cases with an increase in market share from 1.6% to 4.5%. The combined market share of these 25 arrangers equals 70.2% in the first half of 2006. Similarly, Ben Esty reports on his PF Portal a total market share of 36.8% (33.6%) for the top ten lead arrangers in 2003 (2004) ranging from 2.8% to 5.6% (2.7% to 5.5%) for individual lead arrangers. This relative contestability contrasts sharply with the pattern observed in lead underwriting market shares for IPOs, seasoned equity offerings, and public debt offerings, where the same ten banks account for two-thirds or more of global security underwritings year after

[8] As a robustness check and to confirm that the same proxy generated from another data source provides the same results, we also use *Project Finance International (PFI)* annual league table rankings of lead arrangers. We find that they are similar. To perform this test, we restrict ourselves to the top ten lead arrangers in *PFI*'s league table. Instead of a market share based proxy, we define our continuous proxy as the number of lead arrangers who are among the top ten lead arrangers in *PFI*'s league table in the one or three years prior to loan signing. Consistent with the findings reported in Table IV, we find that prestigious lead arrangers are associated with loans that have lower spreads, higher arranger fees, and generally equal non-arranger and total fees. Regarding the correspondence of the PFI league tables and the Dealscan league tables, only four of the 22 banks listed in Table II do not appear among the top ten banks in the *PFI* league tables in any year. These are the Australia & New Zealand Banking Group, Gulf International Bank, EBRD, and Chiao Tung Bank. We conclude that even if the data sources used for constructing the league tables, as well as the exact rankings differ across league tables, the results are robust. Detailed results are available upon request.

Table II. League Table for Lead Arrangers in Project Finance Loans Signed between January 1, 1987 and December 31, 2005

This table is obtained from Dealscan's predefined league table for all project finance loan tranches that includes all deals and is based on the fully underwritten amount for each lender. We report only the top 22 banks that were active as lead arrangers in the global project finance loan market from 1987 to 2005. The total tranche amount represents the size of the tranche that the bank has arranged. In the case of multiple lead arrangers, the full tranche amount is allocated to all banks. Banks involved in mergers are marked with an *. The name of the bank in 2005 is reported and the data reflects the market shares of all merged banks.

Lead Arranger	Number of PF Tranches	PF Tranche Volume (Real 2005$ bn)	Annual Market Shares from 1987 to 2005 (in%)		Number of Years with Market Share (MS) in Range		
			Average	Median	1%≤MS<2%	2%≤MS<5%	5%≤MS
Credit Agricole Indosuez*	202	116.0	4.5	2.8	1	11	3
BNP Paribas*	143	107.7	2.7	1.6	1	6	3
Mizuho Bank*	344	101.6	4.7	3.4	3	10	5
Citigroup	329	95.8	6.9	4.4	3	9	7
JP Morgan Chase*	278	90.3	7.9	5.7	2	3	10
Royal Bank of Scotland*	205	84.8	3.4	3.0	2	10	2
Bank of Tokyo-Mitsubishi*	293	80.8	3.6	2.5	2	10	4
Societe Generale	256	77.8	2.3	1.8	3	6	2
Hongkong & Shanghai Banking Corp	231	77.5	2.5	2.2	3	9	1
ABN AMRO Bank	284	66.3	2.3	2.2	3	9	2
Sumitomo Mitsui Banking Corp*	253	63.6	2.9	2.6	2	10	3
Bank of America*	220	51.3	2.3	1.6	5	8	1
Barclays Bank / BZW	150	49.9	2.3	2.6	3	8	2
West LB	132	42.4	1.3	1.3	4	7	0
Deutsche Bank*	177	40.5	1.8	1.3	5	6	1
Australia & New Zealand Banking Group	175	34.2	1.0	1.2	8	2	0
ING*	131	31.1	1.0	0.7	3	4	0
Credit Suisse First Boston*	93	30.7	1.9	1.9	1	8	1
Union Bank of Switzerland*	86	29.1	2.9	2.1	1	6	4
Gulf International Bank	47	28.9	0.5	0.0	2	3	0
EBRD	79	27.3	0.4	0.0	0	1	0
Chiao Tung Bank	40	26.6	1.1	0.0	1	0	2
Total annual market share of all 22 banks			**60.0**	**56.0**			

year. Alternatively, Table II also indicates that the top ten banks, such as Citigroup, JP Morgan Chase, or Mizuho Bank, can and do achieve prominence as lead arrangers. This prominence tends to endure long enough to be economically relevant.

D. Methodology for Estimating Loan Spread and Fees

To formally test whether valuable certification occurs in the PF loan market and to determine who pays for it, we must specify a model for loan spreads and fees. We draw on loan pricing studies and the methodologies presented in, among others, Booth (1992), Altunbaş and Gadanecz (2004), and Carey and Nini (2007). First, we separate our observations into different quartiles based on the lead arranger market share and assess, by means of a Wilcoxon test, whether the average spread, total upfront fees, arranger upfront fees, and nonarranger upfront fees of PF loans arranged by banks with high lead arranger market share are different from PF loans arranged by low lead arranger market share banks. Additionally, we conduct regression analyses to test our hypotheses using spread and fees as our dependent variables. For each of our four loan features, spread, total upfront fee, arranger upfront fee, and nonarranger upfront fee we estimate a single regression that includes (besides the lead arranger proxy discussed earlier in Section II.C) proxies that control for project risk:

$$\begin{aligned} \textit{Loan feature} = \alpha &+ \beta\, \textit{lead arranger prestige} + \sum_i \rho_i\, \textit{institutional risk proxies} \\ &+ \sum_i \varphi_i\, \textit{microeconomic loan and characteristics} \\ &+ \sum_i \gamma_i\, \textit{operational risk proxies} + \sum_i \delta_i\, \textit{industry risk dummies} \\ &+ \sum_i \phi_i\, \textit{year dummies} + \varepsilon. \end{aligned} \tag{1}$$

Institutional risk is proxied by country risk ratings and creditor rights scores. The country risk measure is based on the *Euromone*y Country Risk Index and combines political, economic, and financial risk factors. Additionally, we measure the creditor rights in the country in which the project is located based on Djankov, McLeish, and Shleifer (2007). For both proxies, a higher value indicates better institutional settings, lower country risk, or better creditor rights.

Additionally, microeconomic loan and deal characteristics include six factors. The first two are basic loan details: 1) the maturity of the loan and 2) the size of the loan (in logs of real 2005 dollars). In addition, three dummies measure the existence of: 3) a repayment guarantee, 4) a debt rating, and 5) currency risk equal to one when the loan currency differs from the currency in the project's country and zero otherwise. The last factor controls for any influence that the potential bias in the fee proxy can have on our results, 6) the standard deviation across tiered fees. The predicted impacts of the first five variables are ambiguous. These proxies can be interpreted as direct measures of credit risk since a PF loan with a guarantee or without currency risk is less risky, while a rating may improve the transparency of the project and, as such, the loan. Alternatively, these proxies can be interpreted as indirect signals of risk. Only the riskiest loans may require a guarantee to reduce credit risk or a rating to certify the credit quality of the project, while only the safest loans are able to support foreign currency debt. Moreover, operational risk proxies are captured by five variables: 1) the existence of a secured loan, 2) a loan with general

or 3) a financial covenant, 4) projects with operational risk management contracts such as an off-take or a supply contract, and 5) projects in which the sponsors act as contractual counterparties of the vehicle company as suppliers, customers, or contractors of the project. As noted for the microeconomic loan and deal characteristics above, these proxies can indicate an ex post risk reduction or can be seen as an ex ante signal of higher risk as modeled in Corielli et al. (2010). Finally, we employ industry and year dummies to allow for credit risks to vary across industries or over time.

Using these proxies, we estimate Equation (1) with OLS for the first loan feature, loan spread. As we use a sample of tranche-level observations, we can expect that the standard errors for tranches belonging to the same deal are correlated with each other. We take this into account by estimating standard errors clustered by deal. The remaining loan features, overall upfront fee, arranger upfront fees, and nonarranger upfront fees, are censored variables that can only take values at or above zero. Therefore, we apply a maximum likelihood estimation of a Tobit model for Equation (1) using deal-level observations.

E. Univariate Tests or Spreads, Arranger Fees, Nonarranger Fees, and Total Fees

As noted above, we begin our analysis by performing a simple distributional analysis of the main sample of PF loans. In Table III, we sort loan observations into quartiles based on lead arranger market shares to observe the spread and total upfront, arranger upfront, and nonarranger upfront fees of PF loans with more versus less prestigious arrangers (at different levels of market share). In Table III, the sample is larger than the 2,480 tranches used throughout rest of the paper since we only need our prestige proxy and the spread proxy.

The VCH predicts that PF loans arranged by more prestigious arrangers (e.g., those with higher market shares) will have lower spreads. The univariate findings in Table III strongly confirm the VCH. Mean and median spreads decrease significantly as arranger share increases. Note that those lead arrangers falling into the very high market share quartile are given a value of one for our high prestige dummy presented in Section IIC. As the difference in spread between the moderately high and very high lead arranger quartile in Table III is not significant, our high prestige dummy might perform less well in the regressions than our market share based proxy of prestige.

Table III also presents evidence regarding how and by whom prestigious arranging banks are compensated for providing certification. The DCH predicts that top arranging banks will be paid higher direct fees. The results generally support this in that mean arranger upfront fees increase significantly and monotonically with arranger market share up to the moderately high market share quartile. There is no clear univariate association between nonarranger upfront fees and lead arranger prestige, but fees are higher for the very low arranger share quartile than for the very high arranger share quartile. The same is true for total upfront fees. Interestingly, the median arranger upfront fee is zero for all arranger share quartiles suggesting that separate fees are paid to arrangers only in a minority of loans. However, when these fees are paid, prestigious arrangers receive disproportionate shares. In sum, the data suggests that prestigious lead arrangers are able to organize bank syndicates at lower spreads than less prestigious arrangers, but leading banks are also able to keep a higher portion of the total fees paid by imposing their bargaining power on other members of the syndicate. To illustrate, let's compare the loans with very low versus very high prestige arrangers. Whereas, on average, less prestigious arrangers are associated with loans having a spread of 212.20 bp, a total upfront fee of 75.82 bp, arranger fee of 8.90 bp, and a nonarranger fee of 73.10 bp, highly prestigious arrangers are associated with loans with a spread of 154.10 bp, a total upfront fee of 56.87 bp, an arranger fee of 20.77 bp, and a nonarranger

Table III. Test for Differences in Project Finance Characteristics for Different Levels of Lead Arranger Market Share

This table reports statistics for project finance characteristics that are separated into quartiles based on the lead arranger market share. The analysis is conducted on the tranche level for spreads and on the deal level for fees. Since several tranches or deals can have the same lead arranger market share, the number of observations is slightly different across the different quartiles. The analyses use all observations with non-missing values for the lead arranger market share and the respective dependent variable. Standard deviations are reported in the "Std Dev" column and the number of observations in the "Obs" column. The Wilcoxon test is a non-parametric test that assesses the difference in means between the current quartile and the next quartile of the dependent variable based on a one-sided probability.

Dependent Variable	Lead Arranger Market Share Quartile	Average Prior Three-Year Lead Arranger Market Share			Dependent Variable				Obs.
		Mean	Median	Std Dev	Mean	Median	Std Dev	Wilcoxon *z*-test	
Spread	Very low	0.07	0.04	0.07	212.20	175.00	161.39	6.32***	659
	Moderately low	0.62	0.59	0.24	163.03	137.50	117.03	2.08**	659
	Moderately high	1.61	1.57	0.36	147.46	130.00	98.74	0.89	668
	Very high	3.63	3.25	1.23	154.10	135.00	130.10		649
Arranger upfront fee	Very low	0.04	0.01	0.04	8.90	0.00	31.67	3.45***	189
	Moderately low	0.51	0.50	0.24	18.09	0.00	41.61	−2.52**	188
	Moderately high	1.49	1.45	0.32	23.69	0.00	39.60	−0.83	189
	Very high	3.39	3.03	1.23	20.77	0.00	38.50		188
Non-arranger upfront fee	Very low	0.04	0.01	0.04	73.10	65.00	53.87	−2.73***	189
	Moderately low	0.51	0.50	0.24	59.46	50.00	51.08	−0.59	188
	Moderately high	1.49	1.45	0.32	60.38	60.00	45.89	−3.12***	189
	Very high	3.39	3.03	1.23	48.23	41.88	37.90		188
Total upfront fee	Very low	0.04	0.01	0.04	75.82	65.00	55.24	−1.36*	189
	Moderately low	0.51	0.50	0.24	67.97	61.25	51.90	−0.45	188
	Moderately high	1.49	1.45	0.32	68.38	65.00	46.99	−2.79***	189
	Very high	3.39	3.03	1.23	56.87	50.00	39.27		188

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

fee of 48.23 bp. These simple sample analyses, however, do not allow us to control for project risks. Therefore, we proceed with regression analysis where we can take these risks directly into account.

III. Empirical Tests of the Valuable Certification Hypothesis

Panel A of Table IV reports loan spread regression results for our two lead arranger prestige proxies and for different combinations of risk proxies. Regressions (1) and (2) demonstrate that spread is negatively related to lead arranger market share after all other factors are accounted for, supporting the VCH. Each one percentage point increase in lead arranger market share is associated with a reduction in spreads of 6.24 bp. Since the average (median) spread on all sample loans is 169.2 bp (140.0 bp), and the three-year average market share of lead arrangers varies between zero and 9.24% for loans in our sample, these estimated coefficients reflect an economically and statistically significant relationship between arranger prestige and loan spread. However, this is not true when we use the high prestige dummy as our lead arranger prestige proxy. The negative, but insignificant coefficient here may be driven by the pattern documented in Table III where spreads are only significantly higher for the very low and moderately low market share quartiles. Thus, it appears that for the nonconcentrated and contestable PF market, a dummy that is commonly used in studies of reputation effects is less informative than our market share based proxy.

Regarding the impact of institutional characteristics, the significant negative coefficient on country risk indicates that spreads are lower in low risk countries, as expected. Each one point increase in the country risk rating, corresponding to reduced political and economic risk, is associated with a reduction in spreads of 2.5 bp. Similarly, an improvement in creditor rights by one category (from a level of zero to one, one to two, etc.) leads to a reduction in spread of almost 8 bps. Thus, both country-related proxies point in the same direction toward lower spreads for projects in safer countries.

Concerning our six microeconomic loan and deal characteristics, we first observe that spreads are significantly *negatively* related to currency risk, so loans with such risk have spreads that are about 37 bp lower than those without, depending upon the specific regression examined. This finding is in line with Kleimeier and Megginson (2000) and Corielli et al. (2010) and indicates that only the most creditworthy projects with currency risk will be funded. This actually proxies for underlying project value rather than a mismatch between project and loan cash flows, per se. Additionally, we find that there is no statistically significant relationship between spread and loan maturity. Moreover, spreads are negatively related to tranche size. This result, combined with evidence from Panel B of Table IV, indicates that larger loans are cheaper in terms of spread, but that they also pay higher total and arranger fees. This is additional evidence of the existence of the trade-off between spread and fees faced by the borrower. Furthermore, guaranteed loans have spreads that are about 23 bp lower, on average, than those of nonguaranteed tranches. In contrast to the first two microeconomic loan and deal characteristics, the significantly negative guarantee coefficient indicates that despite a possibly higher ex ante risk of the loan that motivated the use of a guarantee, the existence of such a guarantee actually lowers the ex post risk so that the loan can be priced at a lower spread. Our final financial risk proxy indicates that spreads are 22 bp to 25 bp higher when the project's debt is rated. The existence of an explicit rating on the debt might signal the existence of project bonds for which investors require a rating or higher ex ante project risk. It might also indicate that only the riskiest projects need an explicit rating.

Table IV. Regression Analysis of the Valuable Certification and the Direct Compensation Hypotheses

In Panel A, the unit of observation is the loan tranche. The regressions are estimated using OLS with robust standard errors that are clustered by project finance deal. In Panel B, the unit of observation is the deal. The regressions reflect a Tobit model estimated with maximum likelihood and robust standard errors. For each independent variable, the first row reports the estimated coefficient and the second row reports the *t*-statistic (in parentheses).

	Panel A. Valuable Certification Hypothesis		*Panel B. Direct Compensation Hypothesis*					
Dependent Variable	**Spread**		**Arranger Upfront Fee**		**Non-Arranger Upfront Fee**		**Total Upfront Fee**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Intercept	664.49***	660.77***	–665.78***	–671.51***	74.66**	76.82**	43.19	55.18*
	(6.19)	(6.21)	(–7.69)	(–7.45)	(2.25)	(2.42)	(1.36)	(1.89)
Lead arranger prestige								
Average 3-year prior market share	−6.24***		5.94**		−4.22***		−4.20***	
	(−2.57)		(2.33)		(−3.87)		(−4.06)	
High prestige dummy		−9.27		14.36		−11.22***		−11.28***
		(−1.07)		(1.64)		(−2.96)		(−3.32)
Institutional risk proxies								
Country risk	−2.46***	−2.45***	−0.87**	−0.84**	−1.03***	−1.05***	−1.03***	−1.04***
	(−4.51)	(−4.51)	(−2.17)	(−2.11)	(−5.27)	(−5.34)	(−5.54)	(−5.59)
Creditor rights	−7.65***	−7.79***	6.23	6.09	8.53***	8.49***	7.83***	7.75***
	(−2.67)	(−2.72)	(1.34)	(1.31)	(3.76)	(3.74)	(3.77)	(3.74)
Microeconomic loan and deal characteristics								
Currency risk	−37.02**	−37.65**	7.04	7.45	9.59**	9.35**	12.15***	11.94***
	(−2.19)	(−2.21)	(0.63)	(0.67)	(2.23)	(2.17)	(2.99)	(2.93)
Ln(tranche maturity)	−7.15	−7.13	−12.26*	−12.91*	8.80***	9.34***	7.71***	8.24***
	(−1.47)	(−1.46)	(−1.72)	(−1.81)	(2.64)	(2.81)	(2.52)	(2.68)
Ln(real tranche size)	−12.59***	−13.39***	20.78***	21.54***	−2.22	−2.72	0.45	−0.06
	(−4.56)	(−4.97)	(5.56)	(5.87)	(−1.26)	(−1.56)	(0.27)	(−0.04)
Guaranteed tranche	−23.21***	−23.13***	5.14	5.34	3.66	3.32	3.09	2.72
	(−2.69)	(−2.68)	(0.56)	(0.58)	(1.01)	(0.91)	(0.90)	(0.79)
Rated tranche	24.79**	22.46*	17.90	16.79	−32.34***	−31.53***	−16.30**	−15.43**
	(2.08)	(1.91)	(1.19)	(1.10)	(−3.21)	(−3.11)	(−2.51)	(−2.35)

(*Continued*)

Table IV. Regression Analysis of the Valuable Certification and the Direct Compensation Hypotheses (*Continued*)

Dependent Variable	*Panel A. Valuable Certification Hypothesis*		*Panel B. Direct Compensation Hypothesis*					
	Spread		Arranger Upfront Fee		Non-Arranger Upfront Fee		Total Upfront Fee	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Operational risk proxies								
Secured tranche	15.75**	16.79**	6.38	5.96	−4.34	−3.93	−2.76	−2.40
	(2.24)	(2.42)	(0.77)	(0.72)	(−1.15)	(−1.03)	(−0.79)	(−0.68)
Tranche with general covenants	67.18***	68.45***	59.71*	62.35*	38.81***	36.60***	35.12***	32.69***
	(3.63)	(3.70)	(1.68)	(1.74)	(3.57)	(3.40)	(3.78)	(3.47)
Tranche with financial covenants	−15.77	−15.63	−24.84**	−25.01**	−12.65*	−12.20*	−19.34***	−18.88***
	(−1.53)	(−1.51)	(−2.00)	(−2.04)	(−1.94)	(−1.86)	(−3.50)	(−3.40)
Tranches with operational contracts	10.61	11.08	−7.27	−8.02	11.30	10.91	1.88	1.49
	(0.49)	(0.51)	(−0.43)	(−0.48)	(1.37)	(1.31)	(0.27)	(0.21)
Tranches with sponsors as counterparty	0.01	0.74	−20.93*	−21.37*	0.14	0.20	−8.71	−8.67
	(0.00)	(0.07)	(−1.81)	(−1.89)	(0.02)	(0.03)	(−1.63)	(−1.62)
Standard deviation across all tiered fees								
Arranger upfront fees			7.85***	7.82***				
			(10.67)	(10.41)				
Non−arranger upfront fees					1.50***	1.51***		
					(10.25)	(10.49)		
Total upfront fees							1.39***	1.42***
							(11.00)	(11.35)
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes
log pseudolikelihood			−1, 223.9	−1, 224.8	−3, 403.0	−3, 405.2	−3, 501.4	−3, 503.8
Adjusted / pseudo R^2	0.121	0.118	0.294	0.292	0.29	0.285	0.33	0.325
Number of observations	2,480	2,480	694	694	694	694	694	694

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Regarding operational risk, we find that loans with secured debt and general covenants have higher spreads. Secured loan tranches or tranches in projects with operational contracts are about 16 bp more expensive. Loans with general covenants, however, are dramatically more expensive, between 67 and 69 bp dearer, than loans without general covenants. As discussed above for financial risks, we believe that these three operational hedges have an impact similar to that found for collateral in other studies. They allow ex ante riskier projects to be funded. Given the extensive contractual structure already included in the project contracts, the fact that such operational risk hedges need to be included in the loan contract in addition to the network of project contracts itself clearly signals high ex ante project risk.

IV. Empirical Tests of the Direct Compensation Hypothesis

We now examine how and by which parties arranging banks are compensated for providing certification. We test the DCH by empirically examining the determinants of fees paid to arranging and nonarranging banks by project sponsors.

A. Arranger Upfront Fee Estimations

The DCH makes the straightforward prediction that prestigious arrangers will be "paid" with higher fees, even if the spread of the loan is reduced by certification. The regression estimation results, presented in Panel B of Table IV, support this hypothesis. The coefficient on lead arranger market share is economically and statistically significant. Each one percentage point increase in arranger market share increases the arranging bank's upfront fee by 6 bps. Results for the alternative arranger prestige dummy reveal that a loan arranged by a prestigious lead arranger requires a payment of 14.4 bp higher arranger fees than having the loan arranged by a nonprestigious lead arranger.

The level of arranging bank fees is significantly related to several other variables, besides lead arranger market share. Arranger fees are significantly positively related to loan size, as discussed in the previous section, and negatively related to the average tranche maturity. Each 1% increase in the average tranche's size increases arranger fees by about 21 bp. Regarding operational risks, arranger fees are higher for deals that include tranches with general covenants and lower for deals that include tranches with financial covenants and tranches with sponsors as counterparties. There are several possible explanations for these coefficients. The positive sign of the general covenants coefficients confirms our interpretation that covenant inclusion is associated with ex ante riskier loans for which banks require higher compensation in terms of fees. The positive sign of the financial covenants may instead be due to their function as a monitoring tool after the loan has been granted, in line with the indications of Rajan and Winton (1995). Furthermore, the negative sign of the tranches with sponsors as the counterparty dummy is clearly explained by the incentive mechanism placed on sponsors as documented by Corielli et al. (2010).

B. Nonarranger and Total Upfront Fee Estimations

Having documented that certification creates value and that prestigious arranging banks are paid for providing this certification in the form of higher lead arranger fees, we now ask which party pays: the borrower, in the form of higher total fees, or nonarranging banks that participate in the loan syndicate assembled by a prestigious arranger. The results in Panel B of Table IV indicate that participating banks pay for certification in the form of lower nonarranger upfront

fees, and that sponsors pay lower total upfront fees for loans syndicated by prestigious arranging banks. Each one percentage point increase in average lead arranger market share is associated with a highly significant decline in nonarranger upfront fees of 4.22 bp, while the overall amount of total upfront fees paid by project sponsors to the banks in the syndicate declines by 4.20 bps. Similarly, a loan arranged by a prestigious bank is associated with a decline in nonarranger upfront fees of about 11 bps and a similar decline of about 11 bps for the total upfront fees. Thus, contracting with a highly prestigious bank to syndicate a PF loan creates value by reducing the amount of compensation (fees) other banks will get for participating in the loan syndicate and by reducing the total amount of fees the project sponsors must pay to successfully obtain loan funding, in addition to reducing the spread charged on these loans. These results are similar to the findings of Roten and Mullineaux (2002), Schenone (2004), Narayanan, Rangan, and Rangan (2007), and Yasuda (2005) who find that bank participation in corporate debt underwritings reduces underwriting fees.

In addition to arranger market share, other explanatory variables have similar impacts on the levels of both nonarranger and total upfront fees. Both sets of fees decline significantly when loans are arranged for borrowers in countries with lower political risk (the coefficient on country risk is negative for both sets of regressions) and both fees increase significantly with creditor protection. This latter result signals the existence of a trade-off between the level of spread and fees. The presence of currency risk and a longer loan tenor increases credit risk for lenders that require compensation in the form of higher fees to participate in the syndicate. In contrast, a rating lowers credit risk for lenders, thus lowering their required fees. As far as general covenants and financial covenants are concerned, the signs of the coefficients are similar to those for the arranger upfront fee. Taken together, the results in this section support the predictions of the DCH. Lead arranger fees are significantly positively associated with arranger prestige demonstrating that top arranging banks are compensated for providing certification through higher direct payments. However, nonarranger fees are significantly negatively related to lead arranger market share indicating that banks participating in loan syndicates accept lower fees when a prestigious arranger syndicates the loan. Total upfront fees are lower when a prestigious banker syndicates a loan than when lesser banks are arrangers. The evidence confirms that not only are prestigious arrangers able to fund projects at a lower cost (in terms of both spread and total fees) than less prestigious ones, they are also able to exploit their reputation by keeping a higher portion of these fees as a compensation for providing certification. Put differently, the data indicate that the banks participating in a PF loan syndicate pay for certification, rather than the project sponsors.

V. Controlling for Potential Endogeneity

Prestigious lead arrangers might be able to select high quality projects and reject low quality ones. If this is true, the negative effect of lead arranger prestige on spreads might not only measure lead arranger certification, but might also indicate the ex ante lower risk of these projects. Without controlling for such self-selection or endogeneity, we might overstate the effects of arranger prestige. For this reason, we also estimate endogenous treatment models with homogeneous effects using methods described in Woolridge (1997, 2002) for our market share proxy of lead arranger prestige and in Heckman (1979) and Greene (1981) for our high prestige dummy. The latter model has been applied to security underwriting by Gande, Puri, and Saunders (1999) and, more recently, by Fang (2005), though these authors consider heterogeneous effects and examine

certification by commercial and investment banks in the context of public security offerings by listed firms in contrast to our focus on privately arranged and funded deals.

Consider our analysis of spreads reported in Regression (2) of Panel A in Table IV, where we use the high prestige dummy as our proxy for lead arranger prestige. If projects are not randomly selected by prestigious lead arrangers, then our proxy is endogenous and its estimated coefficient is inconsistent. Heckman (1979) and Greene (1981) present a consistent estimator that requires, as a first step, the estimation of a selection equation. This selection equation models which projects are chosen by the lead arranger and, in our case, takes the form of Equation (2):

$$\begin{aligned} \textit{lead arranger prestige} = \alpha &+ \sum_i \rho_i \textit{ institutional risk proxies} \\ &+ \sum_i \varphi_i \textit{ microeconomic loan and deal characteristics} \\ &+ \sum_i \gamma_i \textit{ operational risk proxies} + \eta_1 \textit{ project complexity} \\ &+ h_2 \textit{ syndicate home bias} + \varepsilon. \end{aligned} \tag{2}$$

We expect that prestigious lead arrangers select specific types of projects. Our focus, in Equation (2), is on institutional, financial, and operational risk. We add instruments that are exclusive to Equation (2); that is, they affect the lead arranger's choice of a certain project, but do not affect the spread or fee of the project's loan.

Our choice of instruments is inspired by Fang (2005), who uses firm size and the firm-bank relationship when modeling the matching between underwriter and issuer. First, we consider the complexity of the project since prestigious lead arrangers are more likely to arrange larger deals as they have the ability, the market reach, and the track record to attract lenders in the large numbers required to fund a major project. Thus, we expect a positive coefficient for this variable. We measure complexity by using a dummy equal to one for multiple tranche deals and zero otherwise. With an average real deal size of $520 million, multiple tranche deals are substantially larger than single tranche deals, which report an average real deal size of only $244 million. When measured relative to their country or industry peers, multiple tranche deals are also substantially larger than single tranche deals. As such, a multiple tranche dummy captures larger, more complex deals though this is relatively uncorrelated with our real tranche size. Additionally, we consider whether or not the project is located in the lead arranger's home country. Our idea is that a domestic borrower might find it easier to approach a domestic lead arranger due to geographic or cultural proximity. A lead arranger might also exhibit a home bias and be more critical when selecting foreign projects. We measure this home bias as an index that takes the following values: –1 times the number of lead arrangers if the syndicate consists of domestic lead arrangers only, zero for a syndicate consisting of domestic and foreign lead arrangers, and the number of lead arrangers if the syndicate consists of foreign lead arrangers only. We test the strength of our instruments in the sense of Staiger and Stock (1997), who argue that strong instruments should be highly significant in the first stage regression of Equation (2). The significance tests reported in Table V, as well as the Wald tests (not reported), on the joint significance of the two instruments of Equation (2) indicate this is indeed the case.

Having established the appropriateness of our instruments, we continue with the estimation of Equation (2). As our dependent variable is measured as a dummy, Equation (2) is estimated as a probit model with robust standard errors. From Equation (2), we obtain the inverse Mills ratio

Table V. Endogeneity-Robust Regression Analysis of the Valuable Certification and Direct Compensation Hypotheses

In Models (1) and (3), we use the predicted values from Stage 1 as an instrument for lead arranger prestige in Stage 2 and use bootstrapping to obtain standard errors. In Panel A, the unit of observation is the loan tranche and standard errors are robust and clustered by project finance deal. In Panel B, the unit of observation is the deal and standard errors are robust. For each independent variable, the first row reports the estimated coefficient and the second row reports the *t*-statistic (in parentheses).

	Panel A. Valuable Certification Hypothesis				*Panel B. Direct Compensation Hypothesis*							
	Model (1)		**Model (2)**		**Model (3)**				**Model (4)**			
Dependent Variable	**Average 3-year Prior Market Share**	**Spread**	**High Prestige Dummy**	**Spread**	**Average 3-Year Prior Market Share**	**Arranger Fee**	**Non-Arranger Fee**	**Total Upfront Fee**	**High Prestige Dummy**	**ln(arranger fee)**	**ln(non-arranger fee)**	**ln(total upfront fee)**
Intercept	−3.19***	668.68***	−3.25***	638.48***	−4.92***	−211.26**	84.89*	70.92*	−4.93***	0.04	5.50***	3.94***
	(−5.02)	(5.76)	(−7.08)	(6.17)	(−5.01)	(−2.08)	(1.85)	(1.74)	(−4.81)	(0.03)	(6.49)	(5.48)
Lead Arranger Prestige		−20.49*		−54.90*		48.36***	−12.85	−8.83		4.06***	0.68	0.37
		(−1.69)		(−1.66)		(3.04)	(−1.40)	(−1.13)		(5.63)	(1.31)	(0.85)
Institutional Risk Proxies												
Country Risk	0.01	−2.50***	0.00	−2.45***	0.01	−1.20**	−0.97***	−1.00***	0.01	−0.01***	−0.02***	−0.02***
	(1.32)	(−4.59)	(1.45)	(−4.52)	(1.25)	(−2.44)	(−4.61)	(−5.17)	(1.04)	(−2.62)	(−5.54)	(−6.05)
Creditor Rights	−0.02	−7.21**	−0.02	−8.14***	0.04	5.52	8.72***	7.92***	0.01	0.13**	0.24***	0.21***
	(−0.43)	(−2.32)	(−0.83)	(−2.84)	(0.57)	(0.95)	(3.40)	(3.47)	(0.11)	(2.00)	(4.51)	(5.14)
Microeconomic Loan and Deal Characteristics												
Currency Risk Dummy	0.18	−33.97**	0.17**	−34.07**	0.05	−3.26	11.37**	13.11***	0.12	0.00	0.13	0.26***
	(1.60)	(−1.97)	(2.23)	(−2.07)	(0.29)	(−0.23)	(2.12)	(2.71)	(0.87)	(−0.01)	(1.32)	(3.07)
Ln(Tranche Maturity)	−0.06	−7.22	−0.06	−7.16	−0.19	−2.69	7.00*	6.73*	−0.16	−0.02	0.21***	0.21***
	(−1.10)	(−1.48)	(−1.42)	(−1.47)	(−1.54)	(−0.28)	(1.67)	(1.78)	(−1.57)	(−0.20)	(2.61)	(2.95)
Ln(Real Tranche Size)	0.25***	−9.98***	0.15***	−11.46***	0.36***	9.46	0.21	1.75	0.25***	0.00	−0.14***	−0.03
	(8.97)	(−2.70)	(6.46)	(−4.06)	(7.30)	(1.56)	(0.06)	(0.59)	(4.47)	(−0.04)	(−2.64)	(−0.74)
Guarantee Dummy	−0.03	−23.73***	−0.03	−23.59***	0.01	6.29	3.61	3.10	−0.08	0.12	0.10	0.10
	(−0.30)	(−2.74)	(−0.37)	(−2.71)	(0.10)	(0.56)	(0.92)	(0.85)	(−0.64)	(1.11)	(1.30)	(1.58)
Rated Tranche	0.51**	32.28**	0.25**	27.32**	−0.13	19.31	−32.89***	−16.58**	−0.01	0.59*	−0.55*	−0.05
	(2.13)	(2.28)	(2.33)	(2.24)	(−0.36)	(0.89)	(−2.50)	(−2.16)	(−0.03)	(1.80)	(−1.66)	(−0.33)

(*Continued*)

Table V. Endogeneity-Robust Regression Analysis of the Valuable Certification and Direct Compensation Hypotheses (*Continued*)

	Panel A. Valuable Certification Hypothesis				*Panel B. Direct Compensation Hypothesis*							
	Model (1)		**Model (2)**		**Model (3)**				**Model (4)**			
Dependent Variable	**Average 3-year Prior Market Share**	**Spread**	**High Prestige Dummy**	**Spread**	**Average 3-Year Prior Market Share**	**Arranger Fee**	**Non-Arranger Fee**	**Total Upfront Fee**	**High Prestige Dummy**	**ln(arranger fee)**	**ln(non-arranger fee)**	**ln(total upfront fee)**
Operational Risk Proxies												
Secured Tranche	−0.26***	12.96*	−0.04	16.46**	−0.16	11.06	−5.01	−3.13	0.00	0.00	−0.14*	−0.09
	(−2.90)	(1.73)	(−0.69)	(2.38)	(−1.27)	(1.06)	(−1.19)	(−0.81)	(−0.02)	(0.04)	(−1.63)	(−1.37)
Tranche with General	−0.36	63.59***	−0.11	65.71***	0.25	82.03	34.95**	33.01***	−0.64	1.91**	1.35***	1.01***
Covenants	(−1.61)	(3.30)	(−0.73)	(3.525)	(0.59)	(0.85)	(2.15)	(2.56)	(−0.92)	(2.45)	(5.11)	(4.15)
Tranche with Financial	−0.21*	−15.91	−0.15*	−16.66	0.00	−26.29	−12.68*	−19.42***	−0.06	−0.29	−0.23	−0.42***
Covenants	(−1.88)	(−1.49)	(−1.90)	(−1.60)	(0.03)	(−1.58)	(−1.75)	(−3.21)	(−0.40)	(−1.52)	(−1.29)	(−3.10)
Tranche with Operational	0.02	8.94	0.01	12.29	0.26	−13.73	12.67	2.69	0.13	−0.25	0.20	−0.06
Contracts	(0.06)	(0.41)	(0.08)	(0.56)	(1.14)	(−0.59)	(1.31)	(0.34)	(0.51)	(−0.85)	(0.82)	(−0.30)
Tranche with Sponsors	−0.33**	−3.39	−0.32***	−4.23	−0.35**	−12.94	−1.47	−9.60	−0.35	.014	0.12	−0.11
as Counterparty	(−2.41)	(−0.31)	(−3.95)	(−0.36)	(−2.06)	(−0.79)	(−0.21)	(−1.59)	(−1.90)	(0.66)	(0.68)	(−0.68)
Standard Deviation Across all Tiered Fees												
Arranger Upfront Fees					0.00	7.78***			−0.02	0.19***		
					(−0.24)	(7.95)			(−1.10)	(11.55)		
Nonarranger Upfront Fees					−0.02**		1.41***		−0.02**		0.03***	
					(−2.10)		(6.94)		(−2.28)		(6.14)	
Total Upfront Fees					0.00			1.36***	0.01*			0.03***
					(0.37)			(8.59)	(1.74)			(7.43)
Project Complexity	0.39***		0.25***		0.29**				0.31**			
	(4.47)		(3.99)		(2.38)				(2.50)			
Syndicate's Home Bias	0.10***		0.08***		0.11***				0.07***			
	(6.15)		(6.38)		(4.89)				(3.00)			
Mills' lambda				−27.55						2.30***	0.53*	0.33
				(−1.37)						(5.48)	(1.75)	(1.26)

(*Continued*)

Table V. Endogeneity-Robust Regression Analysis of the Valuable Certification and Direct Compensation Hypotheses (*Continued*)

	Panel A. Valuable Certification Hypothesis				*Panel B. Direct Compensation Hypothesis*							
	Model (1)		**Model (2)**		**Model (3)**				**Model (4)**			
Dependent Variable	**Average 3-year Prior Market Share**	**Spread**	**High Prestige Dummy**	**Spread**	**Average 3-Year Prior Market Share**	**Arranger Fee**	**Non-Arranger Fee**	**Total Upfront Fee**	**High Prestige Dummy**	**ln(arranger fee)**	**ln(non-arranger fee)**	**ln(total upfront fee)**
Industry Dummies	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year Dummies	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Endogeneity Tests												
F for x^2 probability		1.70				10.33	1.09	0.37				
		0.19				0.00	0.30	(0.54				
Number of Observations	2,480	2,480	2,480	2,480	694	694	694	694	694	694	694	694

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

(lambda), which is added in the second step to Equation (1) as an endogeneity control such that Equation (1) now becomes:

$$\begin{aligned} \textit{loan feature} = \alpha + \beta\, \textit{lead arranger prestige} + \sum_i \rho_i\, \textit{institutional risk proxies} \\ + \sum_i \varphi_i\, \textit{microeconomic loan and deal characteristics} \\ + \sum_i \gamma_i\, \textit{operational risk proxies} + \sum_i \delta_i\, \textit{industry risk dummies} \\ + \sum_i \phi_i\, \textit{year dummies} + \upsilon\, \textit{MILLS} + \varepsilon. \end{aligned} \tag{1'}$$

Equation (1′) can now be consistently estimated with ordinary least square (OLS) and *t*-statistics can be obtained in a third step as described in Heckman (1979) and Greene (1981). The coefficient β now provides the endogeneity-controlled effect of lead arranger prestige on spreads. A coefficient υ of the inverse Mills ratio that is significantly positive (negative) indicates that unobserved borrower characteristics measured by ε from Equation (2) increase (decrease) the likelihood of attracting a prestigious lead arranger. Fang (2005) interprets such unobserved characteristics as private information of the bank reflecting borrower quality. For our fee regressions, this methodology cannot be directly applied as OLS is an inappropriate estimation model for the censored fee proxies. Nevertheless, to be able to implement this approach, we convert our fees proxies by taking logs. In order to retain those observations that are censored for which fees are zero, we convert all zeros to values just below the smallest nonzero value in our sample. Robustness checks (not reported) find that this conversion does not substantially affect the results of Table IV. As such, we are confident of our implementation of Equation (1′) for these converted fee proxies.

The methodology outlined above is specific to situations where selection takes place in one of two groups where the dependent variable of Equation (2) is a dummy. When the treatment is continuous, as is the case for our lead arranger market share proxy, Woolridge (2002) confirms that a two-stage least square (SLS) estimation of Equation (1) leads to consistent coefficients when the propensity score [the predicted values from the estimated Equation (2)] is used instead of the treatment dummy. For lead arranger prestige proxied by market share in combination with spread, we estimate Equation (2) with a Tobit model. Since the dependent variable is a market share, it is right-censored at one. We use the predicted value resulting from this estimation as an instrument for lead arranger prestige in the 2SLS estimation of Equation (1). For fees, we estimate Equations (2) and (1) as Tobit models, with the predicted value resulting from Equation (2) as an instrument for lead arranger prestige in Equation (1) and with robust standard errors clustered by deal. Maddala (1983) points out that the derivation of the covariance matrix is far from simple in cases where a Tobit or probit regression in the first stage is combined with a Tobit regression in the second stage. Therefore, we use bootstrapping to obtain the appropriate standard errors. Finally, we test the null hypothesis of exogeneity by applying a Wald χ^2-test in the Tobit models and Woolridge's (1995) F-test in the 2SLS regression.

The results are reported in Table V, with Panel A presenting the findings for spreads and Panel B presenting results for arranger, nonarranger, and total upfront fees. Note that in all specifications of Equation (2), our instruments are significant at the 1% or 5% level indicating that they are well

Table VI. Impact of Banking Crises on the Lead Arranger's Position

In Panel A, the unit of observation is the loan tranche. The regressions are estimated using OLS with robust standard errors that are clustered by project finance deal. In Panel B, the unit of observation is the deal. The regressions reflect a Tobit model estimated with maximum likelihood and robust standard errors. For each independent variable, the first row reports the estimated coefficient and the second row reports the $t-$statistic (in parentheses).

	Panel A. Valuable Certification Hypothesis			*Panel B. Direct Compensation Hypothesis*								
Dependent Variable	**Spread**			**Arranger Upfront Fee**			**Non-Arranger Upfront Fee**			**Total Upfront Fee**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Intercept	638.10***	637.20***	641.04***	−668.15***	−664.95***	−667.26***	65.08**	66.10**	70.61**	35.97	37.44	36.52
	(5.75)	(5.69)	(5.20)	(−7.66)	(−7.63)	(−7.60)	(1.95)	(1.98)	(2.12)	(1.13)	(1.16)	(1.13)
Lead arranger prestige = average three−year prior market share												
Prestige	−4.55*	−4.46*	−5.32**	5.72**	5.27**	5.75**	−2.92***	−3.14***	−3.21***	−3.28***	−3.50***	−3.54***
	(−1.78)	(−1.76)	(−2.06)	(2.14)	(2.00)	(2.17)	(−2.81)	(−3.05)	(−3.09)	(−3.18)	(−3.43)	(−3.43)
$crisis_{D,t=0to1}$	71.83***			−10.42			19.67**			17.82**		
	(3.91)			(−0.55)			(2.18)			(2.11)		
prestige * $crisis_{D,t=0to1}$	−18.30***			−0.65			−11.89***			−7.18**		
	(−3.14)			(−0.08)			(−2.91)			(−1.97)		
$crisis_{D,t=0to2}$		58.36***			−13.51			17.97**			15.76**	
		(3.13)			(−0.74)			(2.10)			(1.97)	
prestige * $crisis_{D,t=0to2}$		−17.52***			2.71			−9.00**			−4.81	
		(−2.98)			(0.32)			(−2.10)			(−1.26)	
$crisis_{D,t=0to3}$			32.04*			−10.89			16.41**			13.00*
			(1.83)			(−0.60)			(2.09)			(1.75)
prestige * $crisis_{D,t=0to3}$			−5.64			−1.20			−6.88*			−4.05
			(−0.93)			(−0.15)			(−1.73)			(−1.16)
Institutional risk proxies												
Country risk	−2.34***	−2.32***	−2.32***	−0.92**	−0.93**	−0.97**	−1.00***	−0.98***	−0.95***	−0.98***	−0.96***	−0.95***
	(−4.05)	(−3.96)	(−3.84)	(−2.25)	(−2.27)	(−2.37)	(−5.17)	(−4.97)	(−4.74)	(−5.37)	(−5.19)	(−5.10)
Creditor rights	−8.21***	−8.28***	−8.05***	6.61	6.57	6.54	8.35***	8.24***	8.31***	7.56***	7.52***	7.65***
	(−2.91)	(−2.94)	(−2.85)	(1.42)	(1.41)	(1.39)	(3.74)	(3.68)	(3.70)	(3.69)	(3.65)	(3.71)
Microeconomic loan and deal characteristics												
Currency risk	−37.75**	−37.14**	−37.16**	7.75	7.47	7.78	10.00**	9.89**	10.09**	12.16***	12.08***	12.35***
	(−2.25)	(−2.21)	(−2.21)	(0.69)	(0.67)	(0.70)	(2.28)	(2.27)	(2.32)	(2.95)	(2.96)	(3.02)

(*Continued*)

Table VI. Impact of Banking Crises on the Lead Arranger's Position (*Continued*)

Dependent Variable	*Panel A. Valuable Certification Hypothesis*			*Panel B. Direct Compensation Hypothesis*									
	Spread			Arranger Upfront Fee			Non-Arranger Upfront Fee			Total Upfront Fee			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
ln(tranche maturity)	−7.23	−7.28	−7.13	−12.05*	−12.10*	−11.88*	8.71***	8.60***	8.64***	7.63***	7.54**	7.57**	
	(−1.47)	(−1.49)	(−1.46)	(−1.69)	(−1.68)	(−1.64)	(2.67)	(2.63)	(2.64)	(2.55)	(2.51)	(2.51)	
ln(real tranche size)	−12.01***	−12.26***	−12.46***	20.83***	20.80***	20.86***	−1.73	−1.83	−1.90	0.80	0.66	0.65	
	(−4.27)	(−4.39)	(−4.38)	(5.56)	(5.58)	(5.57)	(−0.96)	(−1.01)	(−1.06)	(0.46)	(0.38)	(0.38)	
Guaranteed tranche	−24.22***	−23.97***	−23.40***	5.41	5.44	5.49	3.37	3.58	3.72	2.96	3.04	3.18	
	(−2.84)	(−2.81)	(−2.72)	(0.59)	(0.60)	(0.60)	(0.93)	(0.99)	(1.03)	(0.86)	(0.88)	(0.93)	
Rated tranche	24.11**	23.24*	24.23**	17.55	17.64	17.24	−32.80***	−32.60***	−32.41***	−16.50***	−16.30***	−16.24***	
	(2.04)	(1.93)	(2.00)	(1.16)	(1.17)	(1.15)	(−3.28)	(−3.27)	(−3.26)	(−2.55)	(−2.53)	(−2.53)	
Operational risk proxies													
Secured tranche	15.29**	15.69**	15.52**	6.36	6.21	5.79	−4.35	−4.23	−4.07	−2.75	−2.55	−2.46	
	(2.18)	(2.24)	(2.20)	(0.77)	(0.76)	(0.70)	(−1.17)	(−1.13)	(−1.09)	(−0.79)	(−0.73)	(−0.70)	
Tranche with general covenants	68.54***	68.60***	67.77***	59.59*	59.87*	58.86*	37.89***	37.82***	38.31***	34.75***	34.86***	35.11***	
	(3.72)	(3.72)	(3.67)	(1.67)	(1.68)	(1.65)	(3.50)	(3.50)	(3.58)	(3.73)	(3.76)	(3.80)	
Tranche with financial covenants	−15.01	−14.89	−14.64	−24.52**	−24.62**	−24.78**	−12.65*	−12.68*	−12.45*	−19.55***	−19.50***	−19.28***	
	(−1.45)	(−1.43)	(−1.40)	(−1.97)	(−1.98)	(−1.99)	(−1.93)	(−1.93)	(−1.90)	(−3.52)	(−3.51)	(−3.48)	
Tranches with operational contracts	10.64	10.21	10.31	−7.40	−6.69	−6.28	10.38	10.37	10.82	1.34	1.22	1.46	
	(0.50)	(0.47)	(0.47)	(−0.44)	(−0.40)	(−0.37)	(1.25)	(1.25)	(1.30)	(0.19)	(0.17)	(0.21)	
Tranches with sponsors as counterparty	0.71	0.68	0.17	−20.33*	−20.64*	−20.17*	0.23	0.14	−0.42	−8.93*	−8.98*	−9.23*	
	(0.07)	(0.07)	(0.02)	(−1.75)	(−1.78)	(−1.75)	(0.04)	(0.02)	(−0.07)	(−1.67)	(−1.68)	(−1.75)	
Standard deviation across all tiered fees													
Arranger upfront fees				7.87***	7.85***	7.89***							
				(10.56)	(10.57)	(10.59)							
Nonarranger upfront fees							1.41***	1.42***	1.43***				
							(8.82)	(8.97)	(9.17)				
Total upfront fees										1.34***	1.35***	1.35****	
										(9.66)	(9.84)	(10.03)	
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
log pseudolikelihood				−1,223.6	−1,223.6	−1, 223.4	−3,397.5	−3,399.1	−3,399.8		−3,497.8	−3,498.7	−3, 499.4
Adjusted / pseudo R^2	0.129	0.127	0.123	0.295	0.295	0.295	0.301	0.298	0.296		0.337	0.335	0.334
Number of observations	2,480	2,480	2,480	694	694	694	694	694	694		694	694	694

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

specified. Regarding the individual instruments, our project's complexity proxy has coefficients ranging from 0.25 to 0.39. This implies that reputable lead arrangers are indeed selecting more complex PF deals than less reputable lead arrangers. The coefficients of the syndicate's home bias proxy range from 0.08 to 0.11 indicating that a weaker home bias is associated with more reputable lead arrangers. Additionally, the indicators of endogeneity, the lambda and the endogeneity tests, are of mixed significance providing an indication that our results for arranger fees might, at least in part, be driven by prestigious lead arrangers who select certain types of loans over others. Moreover, even after controlling for possible self-selection, the coefficient of our lead arranger prestige proxy is still generally consistent with our results in Table IV. When measuring prestige with market share, prestigious lead arrangers are associated with loans that have lower spreads, higher arranger fees, and stable total fees. However, nonarranger fees do not fall significantly with increasing lead arranger reputation. Overall, this suggests that our conclusions supporting the valuable certification and, to a somewhat lesser extent, the direct compensation hypothesis, are robust.

VI. Temporal Effects: The Impact of Banking Crises

Global PF investment had been growing steadily through the late 1990s, but the East Asian financial crisis of 1997–1998 and the subsequent Russian crisis in 1998 led to a sharp drop in sponsor interest (Esty, 2001). Such crises, those not limited to the debt or currency markets, but spreading into the banking sector, may have also caused PF lenders, and particularly lead arrangers, to change their attitude toward PF loan pricing and compensation. To test this intuition, we collect information from Laeven and Valencia (2008) regarding those countries in our sample that experience systemic banking crises. In Laeven and Valencia's (2008) definition, a systemic banking crisis reflects a situation where "a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time." In the case of PF, this definition is even more useful considering the high debt-to-equity ratio used in such deals and the consequent attention creditors can pay to the compensation for an increased default risk in periods of macroeconomic financial turmoil.

To explore the effect of banking crises on spread and fees, we include, in addition to our lead arranger prestige proxy, a country- and year-specific crisis dummy. This crisis dummy takes the value of one for crisis-related loans, those PF deals where the project is located in a country experiencing a banking crisis, and for which the loan is signed during the starting year of the crisis or the one, two, or three following calendar years. In addition, we consider an interaction term between the crisis dummy and lead arranger prestige that reveals how the lead arranger's position changed during the crisis. Referring back to Table I, we find that between 7.69% and 11.48% of the loan tranches in our sample are crisis-related. While most loans are related to the East Asian and Russian crises as these spilled over into various countries, other crises such as the banking crises in Argentina in 1995 and 2001, Brazil in 1994, India in 1993, Lithuania in 1995, Turkey in 2000, or the US in 1988 are also reflected in our sample.

The results offer support for the proposition that arranger certification is indeed driving our loan pricing and fee compensation results. Spread Regression (1) reveals that while lead arranger prestige is always negatively related to spreads, spreads are substantially higher during banking crises. The negative coefficient on the interaction term, however, finds that prestigious lead arrangers can counterbalance the increase in spreads even during crisis periods. This is precisely the time when potential lenders should demand certification by prestigious arrangers in order to

be reassured about a careful risk screening and analysis of the deal. Spread Regressions (2) and (3) extend the period after the start of a banking crisis and confirm that while the lead arranger prestige effect on spreads is stable, crisis-related effects disappear over time.

The fee regression results also support this certification story and the DCH regarding how arrangers are paid for providing certification since the coefficients on the lead arranger market share variables are negative for total fees and nonarranger fees and positive for arranger fees. The crisis-related results are particularly interesting. While attracting a prestigious lead arranger is not more costly during the crisis period, attracting participating banks is substantially more expensive. As Regression (7) indicates, nonarrangers demand almost 20 bp higher fees during a banking crisis, precisely when banks should be the most reluctant to lend. Again, prestigious lead arrangers can reduce this increase which is consistent with valuable certification being demanded and valued by nonarrangers during a time of extreme financial turmoil.[9]

VII. Summary and Conclusions

Using a sample of 4,122 PF loans worth $769 billion arranged from 1991 to 2005, we examine certification by lead arrangers of PF loans. This is an ideal sample because PF vehicle companies are stand-alone entities created for a single purpose. As such, all valuation impacts will be contained in the project financing deal. We propose two hypotheses regarding the role of certification by lead arrangers. First, the VCH predicts that certification by prestigious arrangers will create economic value in that loans can be arranged at lower spreads by more prestigious arrangers. Additionally, the DCH argues that top arrangers will be paid with higher fees, even if the overall cost of the loan is reduced by certification.

Our findings strongly support both the VCH and the DCH. Loan spreads are significantly lower for credits arranged by prestigious banks, and this is robust to various alternative specifications and to correcting for possible endogeneity in the ability of prestigious banks to select the most attractive loans to back. Prestigious arrangers also successfully syndicate PF loans with total fees that are no higher than loans arranged by banks with lower arranger market shares. Top banks are compensated for providing certification with higher upfront arranger fees, but this is offset by the lower nonarranger fees accepted by banks participating in loan syndicates organized by these prestigious arrangers. This evidence confirms that participating banks, rather than PF sponsors, "pay" for the certification that top arrangers provide. We also find that certification is most valuable during banking crisis periods, when information asymmetry is greatest and financial stress is most extreme.

[9] When using the high prestige dummy as a proxy for lead arranger prestige, the findings are similar to Table VI. Results are available upon request.

Appendix A. Definitions of Variables

This table describes the proxies as used in the tranche-level analyses (e.g., spread regressions). For the deal-level analyses (e.g., fee regressions), all proxies are aggregated across the tranches belonging to the same deal. In case the values for a given dummy vary across tranches, the dummy is coded as one on the deal level if at least one tranche has the dummy as one. For example, the deal is considered to be guaranteed if at least one tranche is guaranteed. For the other proxies, the simple average across tranches is used. For example, the deal maturity is the average across all tranche maturities.

Variable	Description	Source
Spread	Spread over the base rate in basis point.	Dealscan
Total upfront fee	Maximum fee in basis points among all arranger and nonarranger upfront fees as reported in Dealscan's "Tiered Upfront Fee" field.	Dealscan
Arranger upfront fee	Maximum upfront fee in basis points among all types of arranger fees as reported in Dealscan's "Tiered Upfront Fee" field. These include arrangement fees, co-arrangement fees, senior arrangement fees, senior co-arrangement fees, and lead arrangement fees.	Dealscan
Nonarranger upfront fee	Maximum upfront fees in basis points among all types of nonarranger fees as reported in Dealscan's "Tiered Upfront Fee" field. These include participation fees, underwriting fees, management fees, lead management fees, front-end fees, etc.	Dealscan
Standard deviation across all tiered fees	Standard deviation across the different nonzero tiers of arranger, nonarranger, or all upfront fees, respectively. Zero if fees are not tiered.	Dealscan
Lead arranger market share	The annual market share of each arranger is obtained from annual PF league tables where the full amount of a tranche is allocated to each lead arranger. Market shares are calculated as the individual lead arranger's amount in percent of the total amount of all lead arrangers in the league table. Based on the year of loan signing, one-, three-, and five-year prior average market shares are calculated. The lower number of observations for the five-year lead arranger market shares is due to the fact that league tables only began in 1987. Thus, no five-year market shares can be calculated for loans signed in 1991. For loan tranches with multiple lead arrangers, both the sum, as well as the average, of all individual lead arranger market shares is used. Market shares are calculated by bank group. Mergers are taken into account and, as such, the relevant market shares depend upon the year of loan signing.	Dealscan
High prestige dummy	Dummy equal to one if the market share of the lead arranger(s) falls into the top 25% quartile, and zero otherwise. This dummy is based on the full sample of 4,122 tranches.	Dealscan

(*Continued*)

Appendix A. Definitions of Variables (*Continued*)

Variable	Description	Source
Country risk	Country risk score ranging from zero for the country with the highest risk to 100 for the country with the lowest risk. The country risk score is based on political risk (25%), economic performance (25%), debt indicators (10%), default/rescheduled debt (10%), credit ratings (10%), bank finance access (5%), short-term finance access (5%), capital markets access (5%). and forfeiting (5%). Weights of each component are given in parentheses.	Euromoney
Creditor rights	An index aggregating creditor rights, following La Porta et al. (1998), provided by Djankov et al. (2007). A score of one is assigned when each of the following rights of secured lenders are defined in laws and regulations: 1) there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization, 2) secured creditors are able to seize their collateral after the reorganization petition is approved (i.e., there is no "automatic stay" or "asset freeze"), 3) secured creditors are paid initially out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers, and 4) if management does not retain administration of its property pending the resolution of the reorganization. The index ranges from zero (weak creditor rights) to four (strong creditor rights) and is constructed as at January for every year from 1978 to 2003. As the creditor rights index is relatively stable over time, loans signed in 2004 and 2005 are assigned the creditor rights index for 2003. Countries without a credit rights score have been assigned a value of zero.	Djankov et al. (2007) available at http://www.andrei-shleifer.com/data.html
Currency risk	Dummy equal to one for tranches that are denominated in a currency different from the currency in the borrower's home country.	Dealscan
Tranche maturity	Life of the tranche in months	Dealscan
Tranche size	Real size of the loan tranche converted into U.S. dollars. To facilitate the comparison of loans signed in different years, the loan size is converted into real values using the IFS's GDP deflator for the US (USY99BIRH).	Dealscan
Guaranteed tranche	Dummy equal to one for tranches that are supported by a guarantee.	Dealscan
Rated tranche	Loan rating based on the S&P and Moody's bank loan rating at close. If missing, S&P and Moody's senior debt rating at close are used. If both ratings are available, the average rating is calculated. For the descriptive statistics, the rating is converted as follows: AAA+ = Aaa1 = 1, AAA = Aaa2 = 2, and so on until D = 28. In the regressions, a dummy is used that equal to one if at least one rating exists. Additionally, a dummy variable is coded as one if any rating exists.	Dealscan
Leverage	Debt-to-equity ratio of the project calculated as (loans + bonds)/equity	ProjectWare
Secured tranche	Dummy equal to one for tranches that are secured.	Dealscan
Tranche with general covenants	Dummy equal to one for tranches that have general covenants.	Dealscan

(*Continued*)

Appendix A. Definitions of Variables (*Continued*)

Variable	Description	Source
Tranche with financial covenants	Dummy equal to one for tranches that have financial covenants.	Dealscan
Construction contract	Operational risk management contract dummy. Dummy equal to one if construction contract exists.	ProjectWare
EPC construction contract	Operational risk management contract dummy. Dummy equal to one if EPC construction contract exists.	ProjectWare
Off-take contract	Operational risk management contract dummy. Dummy equal to one if off-take contract exists.	ProjectWare
Supply contract	Operational risk management contract dummy. Dummy equal to one if supply contract exists.	ProjectWare
Equipment contract	Operational risk management contract dummy. Dummy equal to one if equipment contract exists.	ProjectWare
O&M contract	Operational risk management contract dummy. Dummy equal to one if O&M contract exists.	ProjectWare
Tranche with operational contracts	Dummy equal to one if at least one of the above six contracts exists, zero when no contract exists, and 0.5 when information is missing.	ProjectWare
Tranche with sponsors as counterparty	Dummy equal to one for projects where sponsors are counterparties in the special purpose vehicle company, zero if sponsors are not counterparties, and 0.5 when information is missing.	ProjectWare
Project's complexity	Dummy equal to one for tranches belonging to multiple tranche deals.	Dealscan
Syndicate's home bias	Indicator taking the value of: a) $-1 *$ number of lead arrangers if the syndicate contains only domestic lead arrangers, b) zero for a syndicate consisting of domestic and foreign lead arrangers, or c) $+1 *$ number of lead arrangers if the syndicate contains only foreign lead arrangers.	Dealscan
Tranche size to lender ratio	Log of size of the tranche divided by the number of lenders in the syndicate.	Dealscan
Number of lenders	Number of lenders in the tranche's syndicate. This includes banks in all roles. The defining characteristic is the fact that the bank lends to the project.	Dealscan
Number of lead arrangers	Number of lead arrangers in the tranche's syndicate. Banks are lead arrangers when they are listed in Dealscan's field "lead arranger."	Dealscan
Industry	For each of the following industry groups, a dummy is created: corporate, government, media & telecommunication, utilities, and unknown industry. The control group includes banks and financial services.	
Year	For each year in which the tranche is signed a dummy is created.	Dealscan
$crisis_{D,t=0to1}$	Dummy equal to one for projects in countries in which a banking crisis started in the year of loan signing or in the prior year.	Laeven and Valencia (2008)
$crisis_{D,t=0to2}$	Dummy equal to one for projects in countries in which a banking crisis started in the year of loan signing or in the prior two years.	
$crisis_{D,t=0to3}$	Dummy equal to one for projects in countries in which a banking crisis started in the year of loan signing or in the prior three years.	

Appendix B. Sources for the Lead Arranger's Certification Ability

The unit of observation is the loan tranche. Regression (1) reflects a Tobit model, while Regression (2) reflects a probit model. Both are estimated with maximum likelihood and robust standard errors clustered by PF deal. For each independent variable, the first row reports the estimated coefficient and the second row reports the *t*-statistic (in parentheses).

Dependent Variable	Average 3-Year Prior Market Share (1)	High Prestige Dummy (2)
Intercept	−1.73**	−2.46***
	(−2.51)	(−3.91)
Institutional risk proxies		
Country risk	0.00	0.00
	(0.97)	(0.74)
Creditor rights	−0.03	−0.03
	(−0.73)	(−0.74)
Microeconomic loan and deal characteristics		
Currency risk dummy	0.11	0.13
	(0.96)	(1.18)
ln(tranche maturity)	−0.06	−0.05
	(−1.02)	(−0.99)
ln(real tranche size)	0.42***	0.24***
	(9.57)	(5.87)
Guarantee dummy	−0.06	−0.04
	(−0.60)	(−0.42)
Rated tranche	0.52**	0.26*
	(2.22)	(1.75)
Operational risk proxies		
Secured tranche	−0.26***	−0.04
	(−2.95)	(−0.52)
Tranche with general covenants	−0.27	−0.06
	(−1.19)	(−0.29)
Tranche with financial covenants	−0.23**	−0.17
	(−2.04)	(−1.37)
Tranche with operational contracts	0.01	0.01
	(0.04)	(0.04)
Tranche with sponsors as counterparty	−0.34**	−0.32***
	(−2.54)	(−2.79)
Syndicate's home bias	0.09***	0.08***
	(5.54)	(3.45)
Tranche size to lender ratio	−0.26***	−0.15***
	(−5.30)	(−3.35)
Project's complexity	0.27***	0.18**
	(3.03)	(2.27)
log pseudolikelihood	−4, 338.12	−1, 316.09
pseudo-R^2	0.130	0.071
Number of observations	2,480	2,480

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

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