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Law and Project Finance

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LAW AND PROJECT FINANCE*

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Abstract

We investigate Project Finance as a private response to inefficiencies created by weak legal protection of outside investors. We offer a new illustration that *law matters* by demonstrating that for large investment projects, Project Finance provides a contractual and organizational substitute for investor protection laws. Project Finance accomplishes this by making cash flows verifiable through two mechanisms: (i) contractual arrangements made possible by structuring the project within a single, discrete entity legally separate from the sponsor; and (ii) private enforcement of these contracts through a network of project accounts that ensures lender control of project cash flows. Comparing bank loans for Project Finance with regular corporate loans for large investments, we show that Project Finance is more likely in countries with weaker laws against insider stealing and weaker creditor rights in bankruptcy. We identify the predicted effects using difference-in-difference and triple-difference tests that exploit *exogenous* country-level legal changes and inter-industry differences in free cash flow and tangibility of assets.

JEL classification: G32, G33, G34, K22

Keywords: Agency Cost, Bank Loan, Creditor Rights, Corporate Governance, Insider Stealing, Investor Protection, Law and Finance, Project Finance, Self-Dealing

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I. Introduction

The law and finance literature (La Porta *et al.*, 1997, 1998) highlights that legal rules protecting outside investors vary systematically across countries. As the Coase Theorem (Coase, 1960) predicts, market participants often respond to the inefficiencies from weak investor protection laws by resorting to contractual and private enforcement mechanisms. In this paper, we investigate one instance of this broader phenomenon. We examine Project Finance as a private response to the risks posed by the financing of large investment projects in countries with weak investor protection.

Project Finance (hereafter PF) represents an important financing mechanism for large investment projects. Worldwide, the use of PF has grown dramatically, from a then-record of $217 billion in 2001 to a record $328 billion in 2006 (Esty and Sesia, 2007), though current numbers are lower at $195 billion in 2012. Between 1991 and 2012, PF raised over $2.5 trillion to fund almost 6000 projects.[1] Moreover, the incidence of PF in a country correlates with its economic growth (Kleimeier and Versteeg, 2010). Yet, the choice between financing large projects through in-house Corporate Debt Finance (hereafter CDF) versus through PF has yet to be studied empirically. Our investigation intends to fill this gap.

We observe that PF is considerably more prevalent, relative to CDF, in French than in English legal origin countries: 55% versus 36%. Even when we exclude observations for the U.S., we find this difference to be quite significant: 55% versus 37%. Investor protection laws are also weaker in French legal origin countries than in the English legal origin countries (La Porta *et al.*, 1997, 1998), suggesting that investor protection laws may be important in determining the choice of PF versus CDF.

In PF, a legally independent project company is created to own and invest in the project, and the project debt is structured without recourse to the sponsors (Nevitt and Fabozzi 2000; Esty 2003). With this structure, project cash flows become the essential means for repaying the lender. Verifiability of cash flows, therefore, becomes crucial. PF enhances verifiability by the lender through (i) contractual constraints on cash flows that are made possible by the special structuring of the PF company; and

[1] Source: Loan Pricing Corporation's Dealscan database

(ii) private enforcement of these contracts through a network of project accounts that are under the lender's control and into which project cash flows are required to be deposited. Contractual constraints on cash flows are possible because the Project Company (i) owns only the single, discrete project for which it is created; and (ii) is legally separate from the sponsor. Therefore, project cash flows can be meaningfully separated from the sponsor's other cash flows.

With CDF, by contrast, the commingling of cash flows from multiple projects makes it difficult to segregate project cash flows. Lender monitoring of project cash flows is therefore difficult. Moreover, tightly enforced cash flow constraints similar to those in PF would impede managerial discretion in CDF, which involves not only multiple projects but also internal capital markets within the corporate entity. Therefore, contractual arrangements that are possible in PF cannot be effected in CDF. The choice of PF versus CDF thus presents a trade-off. CDF offers managerial flexibility with respect to allocation of cash flows, but these cash flows are less verifiable. Conversely, PF offers cash flow verifiability, but the attendant cash flow controls preclude managers from funding project-related growth opportunities from internal cash flows or reallocating cash flows across multiple projects, as is possible with CDF.[2]

In countries with weak investor protection, it is *a priori* unclear whether firms and their lenders will prefer the cash flow verifiability that PF offers or the financing flexibility of CDF. PF might be attractive in a country whose corporate and bankruptcy laws provide weak investor protection, since CDF can lead to expropriation of outside investors by corporate insiders. As in Diamond (2004), stronger laws against insider stealing limit diversion of cash flows *ex post*. *Ex ante*, this causes a rightward shift in the entire distribution of cash flows available to all claimants — creditors as well as equityholders. Given their concave payoffs, creditors care about the left tail of the cash flow distribution. Therefore, stronger laws against insider stealing increase the prospects for repayment and decrease the probability of default in CDF. At the same time, stronger creditor rights enhance the lender's threat to liquidate collateral assets.

[2] Project Finance also involves significant transaction costs. For example, creating a stand-alone project company may take from six months to more than a year, and the contracting and other transaction costs may consume from 5% to 10% of the project's total cost (Esty, 2003). Second, the up-front fees are considerably higher for project debt than for corporate debt. Finally, lenders to project companies charge advisory fees of up to 50 to 100 basis points for advice on the financial structure of the transaction (Esty, 2003b).

When cash flows are not verifiable, as with CDF, the lender's threat to liquidate collateral assets is central to forcing the borrower to repay (Hart 1995). However, the lender can liquidate collateral assets only if the legal system provides strong creditor rights. Firms and their lenders may respond to weak investor protection by employing PF, where cash flow verifiability reduces agency costs and enhances the project's debt capacity. With respect to financing of large investment projects, then, PF offers a private contractual and organizational substitute for investor protection laws. This analysis suggests that PF should be more prevalent than CDF in countries with weak investor protection.

However, weak investor protection laws may have the exact opposite effect. Because external financing is more expensive in countries offering weak investor protection, firms may value the flexibility offered by CDF, which enables firms to preserve larger internal capital markets. This flexibility may be more important to firms than the cash flow verifiability that PF offers. Ultimately, which of these two effects manifests is an empirical question, which we attempt to answer in this paper.

Since Project Finance involves primarily bank debt for large investments (Esty 2003), we test our hypotheses by comparing bank loans for PF with bank loans to conventional corporations for their large investments, i.e. CDF. We carefully identify categories of CDF loans such that for each loan in our sample, the counterfactual choice between PF and our sampled categories of CDF is plausible. The sample of bank loans is drawn from Loan Pricing Corporation's Dealscan database, which offers the best source for international bank loans (Qian and Strahan, 2007).

Given our cross-country setting, inferring a causal relationship between country-level investor protection laws and the deal-level choice between PF and CDF presents several challenges. First, country-level laws governing insider stealing and creditor rights may be correlated with other country-level unobserved factors. Second, agency cost considerations are not the sole motivation for PF. Proving our agency cost story requires that we account for other possible motivations as well – most importantly, those relating to asset choice, debt overhang, and risk management (Esty 2003). Third, potential sample selection problems could bias our results. Fourth, differences in tax rates and tax treatment of debt across different countries may affect the choice of PF versus CDF.

To address such econometric concerns, we undertake difference-in-difference and triple-difference tests that exploit exogenous country-level changes in (i) creditor rights; and (ii) laws relating to shareholder derivative suits, which affect shareholders' legal protection. In particular, to highlight a causal mechanism for our results and to rule out the effect of any country-level omitted variables, we investigate inter-industry differences in the effect of investor protection laws on the choice of PF versus CDF. We conduct triple-difference tests interacting measures of industry-level (a) free cash flow to assets and (b) asset tangibility with the variables reflecting the exogenous legal changes. Since PF renders cash flows verifiable, we predict that the effect of these legal changes would be disproportionately greater for industries with higher free cash flows, and hence higher agency costs (Jensen 1986). Conversely, we predict that the effect of our legal changes would be disproportionately weaker in tangible-asset-intensive industries. Because tangible assets are easier to monitor and harder to steal, they provide more attractive collateral than intangible assets. Since tangible-asset collateral provides better protection against default than intangible assets, the increased likelihood of strategic default from weak investor protection is less a constraint on firms' ability to raise CDF in tangible-asset-intensive industries than in intangible-asset-intensive industries. Therefore, investor protection should affect the choice of PF versus CDF disproportionately less in tangible-asset-intensive industries than in intangible-asset-intensive industries.

We instrument for industry-level free cash flows and asset tangibility in a given country using measures of U.S. industry free cash flow and asset tangibility (Rajan and Zingales, 1998). Consistent with our hypotheses, we find that changes in investor protection have disproportionately greater effects in industries with higher agency costs of free cash flow and disproportionately weaker effects in tangible-asset-intensive industries. These triple-difference tests alleviate endogeneity and sample selection concerns on many key dimensions and thereby offer strong evidence supporting our hypotheses. These tests also enable us to highlight the agency cost channel through which investor protection laws affect the choice of PF versus CDF.

The economic effects are significant. In our difference-in-difference tests, a decrease in creditor rights increases the likelihood of PF at least by 3.4%. Also, an improvement in shareholders' right to

derivative suits decreases the likelihood of PF at least by 7.1%. Given the baseline PF percentage of 42%, these differences are economically significant.

Our key contribution is to offer a new illustration that law matters, this time in the context of debt financing of large investment projects. Stronger investor protection laws enhance debt capacity in CDF by improving borrowers' ability to credibly commit ex-ante that they will not strategically default ex-post. Like concentrated ownership for equity investors (La Porta et al. 1998), PF represents the private response of firms and their investors – here, lenders – to weak investor protection. By employing PF as a counter-factual to CDF, our results imply that stronger investor protection encourages CDF by obviating the need for a costly and specialized form of financing that renders cash flows verifiable to the lender, namely PF. To our knowledge, our study is the first to offer such large sample cross-country evidence.

This paper is organized as follows. Section II reviews the literature. Section III explains the key institutional features of PF. Section IV describes our hypotheses. Section V describes our data while Section VI presents the results. Section VII provides a discussion of our results. Section VIII concludes.

II. Review of Literature

As a broad research inquiry, our paper is closely related to the law and finance literature (see La Porta et al. 1997, 1998; Djankov et. al., 2006; Djankov et. al., 2007). As noted earlier, PF offers an important financing vehicle for large investment projects and correlates with a country's economic growth. Our study complements the prior literature by examining the effect of investor protection laws on this important financing choice. We also show that legal origin matters through the provision of investor protection by reducing the effect of agency costs on financing choices. By identifying a micro channel for the effect of legal origins on financing outcomes, this paper complements Qian and Strahan (2007), who find evidence that country level legal and institutional variables affect various price and non-price features of debt contracts.

This paper augments the literature examining PF as an optimal organizational and financing choice. Like our study, Chemmanur and John (1996) focus on the cash flow aspect of PF, asserting that

PF's key feature is the segregation of project cash flows from those of the sponsor. Their formal analysis shows that PF would dominate other alternatives when the structure of the sponsor's private control benefits differs substantially across its projects. Related to this, Shah and Thakor (1987) show that in an asymmetric information setting, PF is sometimes optimal because it lowers creditors' screening costs in evaluating the separately-incorporated project cash flows and mitigates the potential contagion effect of high debt levels on sponsors' solvency. In contrast to Chemmanur and John (1996), we argue informally here that the (lack of) verifiability of cash flows in (CDF) PF, and therefore the (higher) lower private benefits, arise endogenously because of the nature of the contracts that can (not) be written in (CDF) PF. Hainz and Kleimeier (2011) offer a contemporaneous study closely related to ours. They investigate loan contracting in environments with high political risk. Controlling for the legal and institutional environment, they show that political risk correlates with both the use of PF and the participation of development banks in loan syndicates, suggesting that PF and the presence of development banks help mitigate political risk.[3]

Esty (2003) articulates the important institutional details of PF and argues that the governance structure of project companies combines with high leverage to mitigate agency conflicts. He supports his analysis with detailed case studies and field research. Corielli at al. (2010) study the effects on PF of projects' non-financial contracts. They show that use of non-financial contracts—contracts for engineering and construction, agreements for inputs and outputs, and operation and maintenance agreements—reduces loan spreads by reducing agency costs and volatility of project cash flow. Also when sponsors are not key counterparties to those contracts, loan spreads and lenders' demands for sponsor equity contributions are lower. Gatti et al. (2013) demonstrate the crucial certification role that lead arranging banks play in PF, finding that more prestigious lead arrangers reduce overall loan spreads.

[3] Interestingly for our purposes, they find a positive correlation between creditor rights and the incidence of PF, which is contrary to our results below. However, their sample differs from ours in a number of respects: Their sample excludes U.S. borrowers. Also their comparator set of non-PF loans includes what they call "asset-based" full recourse loans, based on a broader range of DealScan loan purpose categories than ours. As explained below in Section V.A., we include only "Capital Expenditure" loans and large "Corporate Purpose" term loans as our CDF comparators to PF. Hainz and Kleimeier's sample, however, additionally includes loans for "telecom buildout," "aircraft and ship finance," "leasing," and "real estate."

Berkovitch and Kim (1990) formally show that if information between debtholders and equityholders is symmetric, PF simultaneously alleviates the problems of under- and over-investment. We complement these studies by employing a large sample of international loans to demonstrate empirically that PF offers a private substitute for legal rules designed to reduce agency conflicts.

Other studies have examined the relationship between PF and legal environments. Kleimeier and Megginson (2000) compare PF loans to non-PF loans, and find that PF loans are far more likely to be extended to borrowers in riskier countries, particularly countries with higher political and economic risks. Esty and Megginson (2003) analyze syndicated PF loans to examine the effect of creditor rights and reliable legal enforcement on the pattern of debt ownership. We contribute to this literature by documenting the effect of a specific country-level risk – the quality of legal protection of outside investors – on the choice of PF versus CDF.

III. Institutional Aspects of PF

PF has four essential features. First, it involves creation of a legally independent Project Company to own and invest in the project. Second, the Project Company invests only in the particular project for which it is created; it is typically dissolved once the project is completed. Third, the project debt is structured without recourse to the sponsors (Nevitt and Fabozzi, 2000; Esty, 2003). These three features together imply that cash flows from the project are the essential means to repay the lender. This observation leads to the fourth essential aspect of PF, which has gone underemphasized in the literature but is the focus of our analysis: PF includes severe constraints on the use and disposition of project cash flows. Compared to CDF, the sponsoring firms have considerably reduced discretion over project cash flows. PF also typically involves very high leverage, the bulk of which is in the form of bank debt.

In PF, project cash flows can be easily separated from those of the sponsor since the Project Company is legally independent and consists of a single project. This enables the Project Company to enter into detailed arrangements with its lenders concerning the use of cash, including private

enforcement through lender-controlled project accounts. This extremely detailed control of cash flow is unique to PF, which is sometimes referred to as "contractual finance." (Esty and Megginson, 2003).

Contractual arrangements dictate a cash flow waterfall, specifying the order in which project cash flows must be distributed. Typically, the borrower is required to use project cash flows first in satisfaction of operating expenses, and then to pay interest and loan principal. The contracts also structure how excess cash flow – cash flow available in excess of what is required to satisfy project expenses and debt repayment – is distributed. The contracts adjust the borrower's repayment schedule for a number of contingencies based on pre-defined financial ratios. The contract commonly includes "cash sharing", "lockup" and "mandatory cash sweep" provisions, which effectively amortize debt at a rate faster than originally scheduled if the project performs appreciably better or appreciably worse than anticipated. We refer the reader to Borgonovo and Gatti (2013) for a detailed description of the covenants used in PF.

The waterfall arrangement is enforced through a variety of project accounts that are typically (a) under the lender's control, and (b) held offshore in order to mitigate currency and other political risks (Buljevich and Park, 1999). These accounts include (i) a proceeds account, into which project revenues are deposited; (ii) a disbursement account, into which all payments to the lender and any distributions to equityholders are deposited; and (iii) a debt service reserve account, in which cash flows are set aside to enable payment of principal and interest in case project revenues are not available. Since these accounts are controlled by the lender, they provide the lender a framework to monitor the borrower's activities without getting involved in the borrower's day-to-day affairs. These lender-controlled project accounts lend teeth to the elaborate and finely-tuned contracting undertaken in the cash flow waterfall contract. These teeth matter especially in countries with weak legal environments, where writing and enforcing contracts may be especially costly.

IV. Empirical Hypotheses

Our prior is that in countries with weak investor protection, firms and their lenders will generally prefer the cash flow verifiability of PF to the financing flexibility of CDF, and we articulate our

hypotheses accordingly. Since cash flows are verifiable with PF but more difficult to verify in CDF, we predict that:

HYPOTHESIS 1: Ceteris paribus, CDF is more likely than PF in countries where creditor rights in bankruptcy are stronger.

HYPOTHESIS 2: Ceteris paribus, CDF is more likely than PF in countries where the protection against insider stealing is stronger.

As well, because the entirety of project cash flows can be pledged in PF, but only a portion of cash flows can be pledged in CDF, this difference in pledgeable cash flows increases with the level of free cash flows in an industry. Since the pledgeability of cash flows in CDF increases with investor protection, we also predict that:

HYPOTHESIS 3: Ceteris paribus, the marginal effects of laws against insider stealing and creditor rights on the choice of PF versus CDF increase with the level of free cash flow in an industry.

PF is typically collateralized through project cash flows, while CDF is collateralized through project/sponsor assets. Because tangible assets are easier to monitor and harder to steal, they provide more attractive collateral than intangible assets. Since tangible-asset collateral provides better protection against default than intangible assets, the increased likelihood of strategic default from weak investor protection is less a constraint on firms' ability to raise CDF in tangible-asset-intensive industries than in intangible-asset-intensive industries. Therefore, the marginal effect of investor protection on the choice of PF versus CDF is disproportionately lower in tangible-asset-intensive industries than in intangible-asset-intensive industries. Thus:

HYPOTHESIS 4: Ceteris paribus, the marginal effects of laws against insider stealing and creditor rights on the choice of PF versus CDF decrease with the level of tangible assets in an industry.

V. Data, Sample and Proxies

A. Sample

We test our predictions using bank loans for PF and CDF from LPC Dealscan; thus our sample includes only firms with PF or CDF loans. Eighty percent of the debt in PF comprises bank debt (Esty, 2003), which is typically in the form of large internationally syndicated loans. We remove syndicated loans with lenders from multiple countries. This enables us to focus on the effect of investor protection on the choice of PF versus CDF within a given country.

We carefully identify categories of CDF loans such that for each loan in our sample, the counterfactual choice between PF and our sampled categories of CDF is plausible. To determine which CDF loans to include, we rely on Dealscan's attribution of the primary purpose for each loan, as well as industry classification. Since PF involves the creation of "a single purpose capital asset" (Esty, 2003), CDF loans with "Capital Expenditures" as their primary purpose offer a natural set of counterfactuals to PF. Indeed, after winsorizing at the 99% level to exclude outliers, we find in Panel A of Table 1 that the loan amounts for Capital Expenditure and PF loans are very similar. The distributions of Capital Expenditure and PF loans are also similar with respect to loan maturity and the number of lenders.[4]

In addition to Capital Expenditure loans, we also include large term loans for "Corporate Purposes" in our sampled CDF loans. Since PF involves large investments, large term loans for "Corporate Purposes" comprise another category where the counterfactual choice of PF is plausible. Consistent with the minimum loan amount for PF loans, which is $10.0 million after winsorizing at the 95% level, we exclude all Corporate Purpose Term Loans with loan amounts (converted in dollars) less than $10.0 million. After this exclusion, we find in Panel A of Table 1 that the mean and median loan amounts for Corporate Purpose term loans are slightly smaller than that for PF loans. Examining the distributions for loan size, loan maturity and number of lenders across the three loan categories suggests that the distribution of loans is very similar for both CDF and PF. Panel B of Table 1 shows the

[4] At the median (mean), the amount of the capital expenditure loan equals 12% (18%) of the CDF borrower's total assets, confirming that the identified capital expenditure projects indeed represent large investments.

distribution of PF and CDF bank loans by industry.[5] Panel C displays the summary statistics for the key explanatory variables.

Our sample includes loans originated from 1993 to 2007; we terminate our sample in 2007 to avoid the effects of changes due to the financial crisis starting in 2008. We treat as outliers those countries with less than five PF or CDF observations during our sample period, and we remove these countries from our sample. Our final deal-level sample contains 18257 deals from 43 countries.[6] In our industry level tests, we have a balanced sample of 4515 observations (43 countries x 15 years (1993-2007) x 7 broad industries). Table 2 displays the number of observations by country, the number of PF and CDF deals, and the percentage of PF deals.

B. Key Explanatory Variables

Table 3 provides a summary of all the explanatory variables and their sources. In the spirit of Shleifer and Wolfenzon (2002), where the ex-ante financing outcome is affected by the ex-post likelihood of a sponsor/manager being caught stealing, our proxy for protection against insider stealing is the index of ex-post private control of self-dealing constructed by Djankov, La Porta, Lopez-de-Silanes and Shleifer (2006) (DLLS). This measure captures the extent of ex-post disclosure that the controlling shareholder must provide in order to engage in a self-dealing transaction and the ease of proving wrongdoing once such a transaction is detected.[7] We also rely on one component of the DLLS index—shareholders' right to bring a derivative suit—in our differencing regressions. We use the creditor rights index constructed in

[5] In examining our data, we found that a few industries were outliers in terms of the dominance of PF over CDF deals or vice versa. Therefore, to ensure the integrity of our comparisons, we exclude all loans for Agriculture, Forestry and Fishing (SIC codes 1-8) and Public Administration (SIC codes 91-97). The former shows only seven PF deals during our sample period while the latter shows only four CDF deals.

[6] A loan deal in Dealscan may contain multiple facilities such as a term loan, a line of credit, etc. We carefully eyeballed the data and found that multiple facilities in a deal can be identified when (a) the borrower name and the deal active date are identical; (b) the primary purpose is the same across the facilities, and (c) aggregating the tranche amounts on each of the facilities yields a sum equal to the loan amount. Hence, we used these three criteria to aggregate the data from the facility to the deal level. For our Corporate Purpose Term Loans, we include only those deals that contain a facility designated as a Term Loan.

[7] This survey measure is not subject to inconsistent coding/ definition (Spamann 2010).

Djankov, McLeish and Shleifer (2007) (DMS) to proxy for creditor rights. A higher value for the DMS index indicates stronger creditor rights.

The laws against insider stealing and creditor rights we measure involve countries' corporate and bankruptcy laws, which are generally mandated based on the *location of the project*. As Bebchuk and Guzman note, the dominant approach to transnational bankruptcies is territorial (Bebchuk & Guzman 1999). Though international loan agreements frequently include a choice of law clause selecting U.K. or New York law (or the law of some other mature commercial jurisdiction) (Novo 2007), this choice of governing law affects only the construction of the credit contract, and not the laws we measure—shareholder rights and creditor rights in bankruptcy. Moreover, the creditor rights we measure have far greater impact on creditor recoveries than the relatively marginal advantages of New York's substantive law on financial contracts, such as limitations on lender liability (Eisenberg & Miller 2009).

VI. Results

We undertake a step-wise analysis to infer a causal relationship between country-level laws and the deal-level choice between PF and CDF. We first offer preliminary evidence favoring our hypotheses in the form of univariate tests. Second, we present the results of difference-in-difference tests exploiting exogenous country-level changes in investor protection laws. We support these results with a number of robustness checks to address potential endogeneity concerns. Third, to highlight a causal mechanism for our results, we run triple-difference tests to investigate inter-industry differences—based on industry-level free cash flow—in the effect of investor protection on the choice of PF versus CDF. Finally, we discuss potential sample selection concerns.

A. Preliminary Evidence

Figure 1 plots the percentage of PF in a country against creditor rights in each country. The graph illustrates that the percentage of PF is negatively associated with the level of creditor rights. This univariate finding is consistent with our Hypothesis 1. Similarly, Figure 2 plots the percentage of PF

against the proxy for protection against insider stealing. As with the level of creditor rights, this graph shows that the percentage of PF is negatively associated with our proxy for protection against insider stealing, consistent with Hypothesis 2. Table 2 also offers data consistent with Hypotheses 1 and 2. It shows that the likelihood of PF relative to CDF is considerably higher in the French legal origin countries than in the English legal origin countries: 55% versus 36%. Even when we exclude the U.S. observations, we find this difference to be quite significant: 55% versus 37%. Since investor protection laws are weaker in French than in the English legal origin countries (La Porta et al., 1997, 1998), this is consistent with our view that investor protection laws may be important in determining the choice of PF versus CDF.

B. Difference-in-Difference Tests

Inferring a causal relationship between PF and investor protection laws presents a challenge insofar as the relationship may be driven by country-level unobserved factors.8 First, country-level laws governing insider stealing and creditor rights may be correlated with other country-level unobserved factors. For example, Kleimeier and Megginson (2000) find that PF is more likely in countries with higher political and economic risks. The incidence of PF in a country may also be correlated with its time varying economic growth (Kleimeier and Versteeg, 2010). Second, agency cost considerations are not the sole motivation for PF. Proving our agency cost story requires that we account for other possible motivations as well – most importantly, those relating to asset choice, debt overhang, and risk management (Esty 2003). Third, since we have to rely on bank loans for our study, potential sample selection problems could hobble our analysis. Fourth, differences in tax rates and tax treatment of debt across different countries may affect the choice of PF.

To identify the causal effect of investor protection on the incidence of PF, we exploit exogenous country-level changes in creditor rights and in shareholders' right to bring derivative suits.

[8] We run unreported logit regressions for the likelihood of PF, obtaining evidence consistent with Figures 1-2. However, the possibility of country-level unobserved factors precludes us from drawing strong conclusions from these tests concerning our hypothesized effects.

Countries differ with respect to the rights they offer creditors during bankruptcy. The DMS creditor rights index assigns each country an index value from 0 to 4 based on how many of the following four creditor rights are recognized in bankruptcy: (i) no automatic stay applies to secured creditors' rights; (ii) secured creditors are paid first in bankruptcy; (iii) no majority creditor consent is required to initiate bankruptcy; and (iv) management is automatically ousted upon bankruptcy. Panel A of Table 4 shows the countries that underwent a change in creditor rights during our sample period. This list is drawn from Appendix A of Djankov, McLeish and Shleifer (2007).

Wider availability of shareholder derivative suits imposes stronger constraints on insider stealing, and this legal feature is included as a component of the DLLS index of ex-post private control of self-dealing. A shareholder derivative suit is an action brought by a shareholder of a company in the name and on behalf of that company in order to seek redress for a harm done to the company by the company's directors or officers.[9] Some countries restrict such suits based on the size of the putative shareholder-plaintiff's holdings in the firm. Others may impose a demand requirement, which forces the shareholder first to petition the company's board for redress before suit may proceed.

Panel B of Table 4 shows the countries that underwent a change in shareholders' right to bring derivative suits. This list is constructed from Siems et. al. (2008), as well as searches for changes in these laws in our sample countries through Lexis-Nexis Global. All these countries improved shareholders' derivative suit rights during our sample period. Three countries—Germany, Italy and Mexico—lowered the minimum ownership requirements for shareholders to file derivative suits, while Australia and Chile instituted the mechanism of shareholder derivative suits. Since the countries that effected changes in creditor rights do not overlap with countries that changed shareholder derivative suit rights, we can cleanly infer the effect of each of these changes.

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[9] Because the firm's top managers–who ordinarily decide for the company who it will or will not sue–cannot generally be expected to subject themselves to suit by the company, shareholders are given the right to sue management in the company's name. Such an action is "derivative" in the sense that the right to sue belongs not to the party actually bringing the action, but is `derived' from the company's rights. Given that it is the company's rights that are sought to be vindicated in such an action, the proceeds of a successful action are awarded to the corporation and not to the individual shareholders that initiated the suit.

Figure 3 depicts the difference-in-difference of the effect of increases in creditor rights on the percentage of PF to CDF at the country level while Figure 4 depicts the difference-in-difference effect of increases in shareholder derivative suit rights on the percentage of PF to CDF at the country level. In these figures, we plot the residuals from a regression of the percentage of PF on country and year fixed effects. Year 0 corresponds to the year of the legal change. Year -1 is one year before the legal change, and Year 1 is one year after the legal change, and so on. For each legal change in the treatment country, we define year 0 for the control group of countries as the year when the legal change happened in the treatment country; years -5 to +5 are then defined accordingly for each legal change. We then average by event year the percentage of PF for the treatment and control groups separately. In both figures, we notice that the time trend in the percentage of PF before the legal change is very similar for the treatment and control groups, which suggests that in the absence of the legal change, the trends for the percentage of PF in both groups would have been similar. Thus, figures 3 and 4 show that the key identifying assumption for a difference-in-difference estimation appears to hold in our sample. Moreover, we notice in Figures 3 and 4 that the percentage of PF decreased following increases in investor protection.

1. Panel Regressions

We implement the econometric variants of Figures 3 and 4 to test for the effect of changes in investor protection laws using the following regression:

(1) $$\text{prob}(y_{kct} = 1) = \beta_k + \beta_t + \beta_1 * \text{CreditorRights}_{ct} + \beta_2 * \text{DerivativeSuitRules}_{ct} + \epsilon_{kct}$$

where y_{kct} is an indicator variable equal to 1 if the bank loan deal to borrower k in country c in year t is PF and 0 if the deal corresponds to a capital expenditure loan or a corporate purpose term loan (our two categories of CDF loans). $\text{CreditorRights}_{ct}$ is defined as in Djankov, McLeish and Shleifer (2007). $\text{DerivativeSuitRules}_{ct}$ equals one for the years after a change occurs in the law governing shareholder derivative suits in the countries listed in panel B of table 4, and equals zero otherwise. β_k and β_t denote borrower and year fixed effects respectively. Since a borrower's country and industry do not change through time, borrower fixed effects subsume the country and industry fixed effects.

Consistent with Hypotheses 1 and 2, we predict that $\beta_1, \beta_2<0$, which we test in Table 5. In all our tests in Table 5, we compute cluster-robust standard errors using the cluster-correlated Huber-White covariance matrix method, where we cluster by country. Column (1) of Table 5 tests specification (1) above. In Column (2), we repeat specification (1) but include (country * industry) fixed effects instead of borrower fixed effects. While all our other specifications use 2-digit SIC industry definitions, in this specification we define industries as per Panel B of Table 1 to avoid an extraordinarily large number of dummies. In both Columns (1) and (2), we find that $\beta_1<0$ and $\beta_2<0$ and are statistically significant, thereby confirming Hypotheses 1 and 2.

We next aggregate deals at the 2-digit SIC level i in country c in year t and estimate an OLS regression that includes country, year and industry fixed effects:

(2) $$y_{ict} = \beta_i + \beta_c + \beta_t + \beta_1 * \text{CreditorRights}_{ct} + \beta_2 * \text{DerivativeSuitRules}_{ct} + \epsilon_{ict}$$

Column (3) of Table 5 shows that our results remain strong in this specification. Using Columns (1)-(3), we estimate the economic effect as follows. Compared to countries that did not undergo a change, an increase in creditor rights decreased the likelihood of PF by at least 4.4% and at most by 7.2%; a decrease in creditor rights increased the likelihood of PF similarly. Given the baseline PF percentage of 42%, these differences are economically significant. Compared to countries that did not undergo a change in rules governing derivative suits, the increase in shareholder protection in the countries in our sample decreased the likelihood of PF by at least 9.1% and at most by 13.7%. Again, given the baseline PF percentage of 42%, these differences are economically significant.

A potential source of bias stems from the possibility that weak investor protection may cause sponsors to forego projects. Since the set of foregone projects is not observable and this set would contract with an increase in investor protection, this dynamic could account for our results by simply increasing the number of CDF deals, even if PF were not a substitute for CDF (and therefore the choice of PF versus CDF would not vary with investor protection). We test for this potential bias by examining the effect of changes in investor protection on the number of PF deals, which should move inversely with

investor protection if our hypotheses are correct, but may not move at all if sampling bias from foregone projects is at work. In Column (4) of Table 5, we use the log of the number of PF deals in a country, industry, year as the dependent variable. We find that the number of PF deals does move inversely with investor protection laws. While a creditor rights change leads to a 14.6% change in the number of PF deals (= $e^{-0.158}$ -1), a change in rules governing shareholder lawsuits changes the number of PF deals by 7.0% (= $e^{-0.073}$ -1). In Column (5) of Table 5, to control for the possibility that the number of PF deals may be greater in larger countries, we normalize the number of PF deals in a country, industry, year by the country GDP in the particular year. This normalization also enables us to control for the possibility that firms in civil law countries may not use the syndicated loan market for CDF loans as much as firms in common law countries. This may be the case if relationship banking is more likely in civil law countries because loans from relationship banks are less likely to be syndicated. From Columns (4) and (5) of Table 5, we conclude that the hypothesized effects remain strong using these alternative measures.

Finally, to alleviate concerns that industry-level shocks may be driving our results, in unreported tests, we re-examine the above specifications by replacing the year fixed effects with industry*year fixed effects. Our results remain qualitatively and quantitatively unchanged.

2. Time-Varying Control Variables

The tests in Table 5 control for several time-varying sources of heterogeneity. First, we include several deal-level controls. The loan spread variable and the indicator variable for an unrated borrower proxy for the various lender costs from asymmetric information relating to the borrower. Rated borrowers are more transparent than unrated borrowers. As well, greater information asymmetry will cause the lender to charge a higher interest rate in order to account for the higher risk. If asymmetric information varies between PF and CDF loans, the loan spread variable and the dummy for unrated borrowers enable us to control for these effects. The variable for loan amount enables us to capture the possible contagion effect that higher debt can have on the sponsor's solvency. Shah and Thakor (1987) argue that separate incorporation, for example through PF, can mitigate this contagion effect. The loan amount variable

controls for this motivation for PF. We also control for the loan's maturity and include a dummy for whether the loan is secured. Our deal-level tests in Columns (1) and (2) include these deal-level controls. Our industry-level tests in Columns (3)-(5) include the averages of the deal-level variables as controls. Among these variables, we find the secured loan dummy to be positively correlated with PF, which is consistent with the greater risk associated with PF loans. We also find the senior loan dummy to be negatively correlated with PF. This result is consistent with the lower verifiability of cash flows in CDF, which causes CDF lenders to demand seniority. We also find loan maturity to be positively correlated with PF, consistent with PF loans having longer initial terms than CDF loans.

Table 5 also includes several industry-level controls. To capture the agency costs of free cash flow in an industry (Jensen and Meckling, 1976; Jensen, 1986), we follow Lang, Stulz, and Walking (1999) by including the median ratio of free cash flow to assets for each 4-digit SIC industry. We find a positive association between the likelihood of PF and industry free cash flow. We also include the median ratio of tangible assets to total assets, the median Tobin's Q, and the median ratio of long term debt to assets for each 4-digit SIC industry. We note that PF is positively associated with tangible-asset-intensive industries and industries with greater leverage. We also control for the possibility that PF could be advantageous in reducing the deadweight costs resulting from debt-equity conflicts that arise with CDF—in particular, leverage-induced under-investment or debt overhang. These deadweight costs arise when a firm has high leverage and significant growth opportunities, so we capture the extent of these deadweight costs at the industry level with our interaction of long term debt to assets with Tobin's Q. The positive coefficient on this interaction implies that PF is associated with industries with greater deadweight costs from such debt-equity conflicts. While the coefficient of long term debt to assets is also significant independent of the interaction, the effect of Tobin's Q is absorbed completely in its interaction with long term debt to assets. This suggests that while leverage is correlated with the choice of PF over and above the deadweight costs from debt-equity conflicts, growth opportunities are associated with PF primarily through their effect on debt-equity conflicts.

Finally, we include country-level controls. We capture time-varying influences of economic growth using the log of GDP per capita and time-varying availability of debt financing at the macro level using the log of private credit to GDP per capita. We find that the likelihood of PF is positively correlated with economic growth, consistent with the findings in Kleimeier and Versteeg (2010). However, the availability of debt financing does not seem to correlate with the likelihood of PF, which alleviates concerns that omitted variables related to changes in credit availability are driving our results.

3. Discussion

The difference-in-difference tests above alleviate important endogeneity concerns, since the tests exploit variation across time in the choice of PF versus CDF within a given industry in a given country. The tests thus compare deals with similar assets in the same country, before and after a law change, against a control group of deals that involve no such law change. First, the within-country variation that we exploit ensures that our results are not driven by time-invariant differences across countries in political or economic risk. Second, including fixed effects for each (country*industry) pair accounts for any unobserved differences in the choice of PF due to: (i) any country specialization with respect to asset choice or industries that might be correlated with investor protection; or (ii) different effective tax rates and tax treatment of debt across different industries within a country. Third, as explained in Section 6.5, these tests account for selection biases that do not vary with time. These tests therefore provide strong evidence that our results are not driven by endogenous country-level or country- and industry-level factors.

C. Robustness Tests.

1. Tests Excluding U.S. and U.K. Observations

One potential concern may be that our results are driven by the disproportionate number of U.S. and U.K. observations in our sample as the control group. To address this possibility, in unreported tests, we replicate the tests in Table 5 after excluding all U.S. observations, and then after separately excluding all U.K. observations. Our results remain unchanged.

2. Separate Effects Of Creditor Rights Increases/Decreases

As seen in Table 4, our sample includes countries that experienced increases in creditor rights as well as those that experienced decreases. We therefore test separately for the effects of increases and decreases on the choice of PF versus CDF. We interact the creditor rights variable with a dummy for countries that experienced a decrease in creditor rights and also with a dummy for countries that experienced an increase. In unreported tests, we find evidence consistent with our hypotheses for both increases and decreases. The economic effect of creditor rights decreases is greater than for creditor rights increases by at least 40%.

3. Dynamic Effects of Exogenous Legal Changes

Given the absence of a differential time trend before the legal changes as demonstrated in Figures 3 and 4 and the lack of correlation between the timing of legal changes and pre-existing patterns of PF, we infer that the legal changes are exogenous to our variable of interest. Nevertheless, we examine the dynamics of the effect of the legal changes on the choice of PF versus CDF for possible reverse causality. We follow Bertrand and Mulainathan (2003) and decompose the period surrounding a change in creditor rights into three separate subperiods: (i) Forwarded Creditor Rights Change, which captures any effect from two years to one year before the change); (ii) Contemporaneous Creditor Rights Change, which captures the effect in the year of and year after the change); and (iii) Lagged Creditor Rights Change, which captures the effect two years after the change and beyond. Similarly, we decompose the change in laws governing shareholder derivatives suits into Forwarded Change in Derivative Suit Rules, Contemporaneous Change in Derivative Suit Rules, and Lagged Change in Derivative Suit Rules. If the coefficient of Forwarded Creditor Rights Change or Forwarded Change in Derivative Suit Rules is negative and statistically significant, that may be symptomatic of reverse causation. However in Table 6, we find that the coefficients for these variables are not statistically significant, which implies that reverse causality may not be a material concern.

We do find crucially that the coefficients of the Contemporaneous and Lagged variables are negative and statistically significant. Moreover, the coefficients for Lagged Creditor Rights Change and Lagged Change in Derivative Suit Rules are consistently larger (in absolute value) than for Contemporaneous Creditor Rights Change and Contemporaneous Change in Derivative Suit Rules, respectively, which implies that the long-run effects of the legal changes are larger than their immediate effects. In fact, the long-run effects are at least 80% greater than the immediate effects.

The absence of reverse causality should not be surprising in our setting because influencing PF is usually not a priority that drives regulatory/legal change. As a result, it is unlikely that legal changes were effected to influence the choice of PF versus CDF. Neither is it likely that omitted variables that influence the choice of PF versus CDF were correlated with the legal changes. Together these various tests strongly imply that any effects on the likelihood of PF following the legal changes can plausibly be attributed to the legal changes themselves.

D. Triple-difference Tests

To highlight a causal mechanism for our results so far – cash flow verifiability in PF – we investigate inter-industry differences, based on industry-level free cash flows, in the effect of investor protection on the choice of PF versus CDF. We estimate the following model:

(3) $\text{prob}(y_{kct} = 1) = \beta_{k \to SIC2} + \beta_{ct} + (\beta_1 * \text{CreditorRights}_{ct} + \beta_2 * \text{DerivativeSuitRules}_{ct} + \beta_3) * \text{FCF/Assets}_{US,t} + \epsilon_{kct}$

where y_{kct} is defined as in (1) before. β_{ct} denotes the fixed effects for each (country, year) pair while $\beta_{k \to SIC2}$ denotes fixed effects for the 2-digit SIC industry. Following Rajan and Zingales (1998), we instrument for industry-level free cash flow in a given country using the median ratio of free cash flow to assets for each 2-digit SIC industry in the U.S. in a given year. Industry-level free cash flow in a given sample country may be endogenous, since industrial patterns in a country may be correlated systematically with country-wide unobserved factors. However, U.S. industry free cash flow is unlikely to be correlated with unobserved determinants of the dependent variable. At the same time, for technological

reasons, a U.S. industry cash flow measure is likely to be correlated with cash flow for the same industry in a different country, making it a useful instrument for capturing the extent to which cash flows may be diverted in a particular industry.[10] We exclude observations for U.S. deals to avoid spurious correlation.

This specification offers our strongest evidence on the causal effect of changes in investor protection on the choice of PF versus CDF. First, the inclusion of fixed effects for each (country, year) pair enables us to control for the effect of any omitted variables at the country level that may be correlated with the changes in investor protection. Changes in investor protection may have coincided with other changes in a given country. For example, the incidence of PF in a country correlates with its economic growth (Kleimeier and Versteeg, 2010), and economic growth may correlate with changes in investor protection laws as well. The inclusion of (country, year) fixed effects soaks up such confounding factors. Consistent with Figures 3 and 4, which suggest the absence of differential trends in the treatment and control groups of countries, these fixed effects enable us to directly control for possible differential trends, and thereby to identify the causal effect of the legal changes.

Moreover, if such biases were to vary at the (country, industry, year) level, because we interact the changes in investor protection with U.S. industry measures of free cash flow to assets, these biases are unlikely to vary with the explanatory variable of interest. β_1 and β_2 measure as a triple-difference the effect of the legal changes on PF. As earlier noted, we expect the effects of investor protection to be stronger in industries with greater free cash flows. Therefore, we expect $\beta_1, \beta_2 < 0$. In our tests in Table 7, we compute cluster-robust standard errors using the cluster-correlated Huber-White covariance matrix method, clustering at the country level. In addition, since the number of treatment clusters (country * two-digit SIC) is large, we use the asymptotic t-distribution for the tests of significance. Column (1) of Table 7 presents the results of the logit regression in equation (3). In Column (3), we aggregate deals at a broad industry level as described in Panel B of Table 1, in country c in year t using an OLS regression:

[10] The proportion of tangible assets in an industry could be an alternative measure for the extent to which cash flows could be diverted. However, since an increase in tangible assets also increases the borrower's ability to pledge assets as collateral for loans, increased tangibility does not offer as clean an interpretation as an increase in ability to divert cash flows.

(4) $$y_{ict} = \beta_i + \beta_{ct} + \left(\beta_1 * \text{CreditorRights}_{ct} + \beta_2 * \text{DerivativeSuitRules}_{ct} + \beta_3\right) * \text{FCF/Assets}_{US,t} + \epsilon_{kct}$$

where $\text{FCF/Assets}_{US,t}$ equals the median ratio of free cash flow to assets for the broad industry in the U.S. in a given year. The coefficients in Columns (1) and (3) confirm that β_1 and β_2 are negative and statistically significant, which suggests that legal changes have a disproportionate effect on the choice of PF versus CDF in industries where the agency costs of free cash flow are greater. These results are consistent with Hypothesis 3. To ascertain the economic magnitude of the effect, consider two industries: one for which the ratio of free cash flow to assets is equal to the mean (0.14) and another for which the ratio of free cash flow to assets is one standard deviation greater than the mean (0.31). The economic effect of a change in investor protection in the industry with higher free cash flows would be about 120% (=0.31/0.14 – 1) greater than in the industry with lower free cash flows.

Columns (2) and (4) of Table 7 present the results of the regressions in equations (3) and (4), respectively, where $\text{FCF/Assets}_{US,t}$ is replaced with $\text{Tangibility}_{US,t}$. These results show that while β_1 is negative and statistically significant, β_2 is positive and statistically significant. This suggests that the legal changes have a disproportionately smaller effect on the choice of PF versus CDF in industries where the tangible assets are greater, which is consistent with Hypothesis 4. For an industry with asset tangibility one standard deviation greater than the mean (0.72 versus 0.35), the economic effect of a change in investor protection is about 106% (=0.72/0.35 – 1) smaller than the effect in the industry at the mean.

E. Addressing Sample Selection Concerns

The exogenous legal changes also enable us to use the difference-in-difference and triple-difference tests to address sample selection issues that might potentially bias our results.

1. Counting Financing Deals versus Counting Projects

First, our sample is comprised of financing deals, as opposed to projects, and we implicitly assume a one-to-one correspondence between financing deals and projects. It is possible, however, that

this assumption is incorrect. For example, CDF projects might sometimes require more than one round of financing, and the number of rounds might vary with investor protection. In that case, our count of CDF deals would overstate the likelihood of CDF by treating multiple financings of the same project as separate financings for separate projects. However, our difference-in-difference tests using exogenous country-level legal changes mitigate this concern. First, our within-country analysis ensures that our results are not an artifact of time-invariant differences across countries. Second, any time-invariant biases that manifest differently across different industries in different countries are also captured by our (country*industry) fixed effects in Column (2) of Tables 5-6. To the extent that the effects of sample selection bias of this nature do not change significantly across time, the difference-in-difference tests provide robust evidence that such bias does not drive our results.

It might still be possible that sample selection problems explain our results of Tables 5-7 if such biases coincide with the country-level legal changes we test. We test directly for this possible sample selection bias in Table 8. If a legal change affected the number of CDF financing rounds per project, we should observe changes in the average maturity for CDF loans following a legal change. Column (1) of Table 8 shows no significant change in CDF loan maturity following a legal change. Therefore, we conclude that this sample selection problem is unlikely to be driving our results.

2. Alternatives to CDF

A second sample selection concern involves the existence of financing alternatives to CDF besides PF that we have not considered in our analysis. Equity financing, public debt, and internal financing at the sponsor level may also be potential alternatives to CDF. If the choice between CDF and any of these alternatives varies with investor protection, this could bias our results. First, consider equity financing. Since dispersed equity is relatively unattractive to investors in countries with weak investor protection, equity financing is relatively more likely to displace PF in countries with strong investor protection. Therefore, we are likely to undercount the equity-financed alternatives to PF by a greater margin in countries with stronger investor protection. Consequently, compared to the use of PF in the

population, our neglect of equity financing possibilities leads us to overestimate the likelihood of PF in countries with strong investor protection. But our hypothesis is that PF is used relatively less in countries with strong investor protection, so this bias works against our hypothesis. In a similar vein, dispersed public debt offers a practical alternative to PF only in countries with well-developed corporate bond markets, which are correlated with strong investor protection as well. Therefore, as with the equity financing alternative, the public debt alternative also stacks the odds against our finding results consistent with our central hypothesis.

Finally, consider internal financing. We anticipate two offsetting dynamics here. First, in countries with weak investor protection, managers are more likely to steal, which may make internal financing less likely because managers would rather steal free cash than invest it. Second, in weak legal regimes, information asymmetry may be severe, causing external financing alternatives to be scarce and leaving internal financing as the only alternative. Thus, the overall effect of investor protection on internal financing may be positive or negative. Irrespective of this net effect, our difference-in-difference tests in Tables 5-6 control for any time-invariant levels of over- or under-estimation in the percentage of PF deals at both the country-level and the country-industry level.

It is possible that following the legal changes we identify, firms altered the proportion of projects that were internally financed. To investigate this possibility, we test using the subsample of our borrower firms for which financial data are available in Global Compustat. Since Rajan and Zingales (1998) define external financing as one minus the ratio of Cash Flow from Operations to Capital Expenditures, we use the ratio of Cash Flow from Operations to Capital Expenditures as our measure of internal financing.[11] Column (2) of Table 8 shows the results of our tests, which include firm and year fixed effects. We find that changes in investor protection had no significant effect on internal financing employed by firms in our sample. Therefore, our primary findings are not an artifact of under- or over-estimation of the likelihood of PF from a failure to consider internal financing as an alternative financing device.

[11] As in Rajan and Zingales (1998), cash flow from operations equals Compustat cash flow from operations plus decreases in inventories, decreases in receivables, and increases in payables.

3. Deal Size and Dealscan

Finally, besides affecting the choice of PF versus CDF, investor protection might also affect deal size in a way that biases our results, because the Dealscan database includes only large deals. Suppose that creditor rights do not affect the likelihood of PF at all, but instead are positively correlated with CDF loan size. CDF might be as likely relative to PF in countries with weak creditor rights as those with strong creditor rights, but the smaller CDF loans in weaker creditor rights countries would drop out of Dealscan's coverage, biasing our sample in favor of our hypotheses. Our tests would be affected only if this (unobserved) sampling bias is correlated not only with the legal changes but also with the interaction of the legal changes with the U.S. measure of free cash flow to assets. Nevertheless, we test for this possibility using the logarithm of deal size as the dependent variable. The results in Column (3) of Table 8 show no significant change in deal size coinciding with the legal changes. In unreported tests, we also investigate whether the legal changes affect deal size for the separate subsamples of PF and CDF loans. We find no statistically significant change in deal size coinciding with the legal changes for either sub-sample. Therefore, we do not believe our results are driven by this sampling criterion.

In sum, our difference-in difference and triple-difference tests relying on exogenous legal changes as well as exogenous inter-industry variation induced by these legal changes enable us to mitigate endogeneity concerns as well as sample selection concerns. Our tests therefore provide strong support for the causal effect of investor protection laws on the choice of PF versus CDF.

VII. Distinguishing PF from Related Mechanisms

We have explained PF as a unique arrangement with both organizational and contractual features that work in tandem to offer a private substitute for investor protection laws by making Project cash flows verifiable. Here, we distinguish PF from related organizational and contractual mechanisms, which offer features similar to PF, but which are by themselves insufficient to make cash flows verifiable.

Separate legal incorporation significantly reduces the cost and difficulty of monitoring managerial actions. However, what is also essential to PF is that the sponsor own and operate only a

single, discrete project. Only this combination of separate incorporation and a single project enables transparent cash flow separation. A subsidiary with multiple projects, for example, offers no advantage as to cash flow separation and monitoring compared to the parent. Rather than monitoring commingled cash flows from numerous assets, and trying to sort out noisy signals on managerial skill, the PF lender monitors relatively simple cash flow streams from a single asset. If the subsidiary company houses multiple projects, the extensive contractual constraints on cash flow necessary to effective monitoring are as costly to the subsidiary as they are to the corporate parent in terms of lost managerial flexibility.

CDF in the form of secured debt offers some of the advantages of PF, but, again, is not a substitute. Secured debt with high leverage (SDHL), for example, offers two advantages of PF. SDHL collateralizes corporate debt with specific assets in the same way that PF does. The high leverage also reduces agency costs of free cash flow by reducing the amount of free cash a manager has available in any period. What SDHL misses, however is cash flow verifiability and concomitant control of the cash. With PF, very little cash is likely ever to be free cash. Even after project expenses and scheduled debt service have been paid in a given period, the cash flow waterfall arrangement dictates the use of any remaining cash. The waterfall arrangement adjusts to absorb any free cash, whether the project generates more or less cash flow than originally anticipated. The standard excess cash flow sweep covenant of Corporate Debt cannot effect the finely tuned cash management embodied in the cash flow waterfall arrangement of PF. Therefore, SDHL cannot explain our main hypothesis – the inverse relationship between the likelihood of PF and the strength of legal protections for outside investors.

Finally, PF requires this tight control of cash since the lender can look only to project cash flows for repayment. More so than with CDF, where multiple projects and growth opportunities offer some risk diversification, the PF lender must guard against the possibility that future cash flows may be poor. This vigilance requires the cash flow waterfall arrangement with its multiple lender-monitored cash accounts. This feature further distinguishes PF from subsidiary incorporation with multiple projects and SDHL.

VIII. Conclusion

We investigate Project Finance as a private response to inefficiencies created by weak legal protection of outside investors. For large investment projects, Project Finance offers a contractual and organizational substitute for investor protection laws by making cash flows verifiable, thereby enhancing debt capacity. Project Finance makes cash flows verifiable through: (i) contractual arrangements made possible by structuring the Project Company as a single, discrete project legally separate from the sponsor; and (ii) private enforcement of these contracts through a network of project accounts that ensures lender control of project cash flows. Comparing the incidence of bank loans for Project Finance with regular corporate loans for large investments ("Corporate Debt Finance"), we show that Project Finance is more likely in countries with weaker laws against insider stealing and weaker creditor rights laws.

While we focus on private debt alternatives to Project Finance, our results may have broader implications. In weak legal environments, Project Finance may be preferable not only to Corporate Debt Finance, but also to equity and public debt finance since weak investor protection laws reduce their attractiveness. If this conjecture holds, then our findings may extend to the choice of Project Finance versus external Corporate Finance in general. This is an interesting question for future study.

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Figure 1: Percentage of Project Finance by Country versus Creditor Rights

The y-axis plots the percentage of Project Finance deals in a country while the x-axis plots the DMS creditor rights. Higher values indicate greater creditor rights.

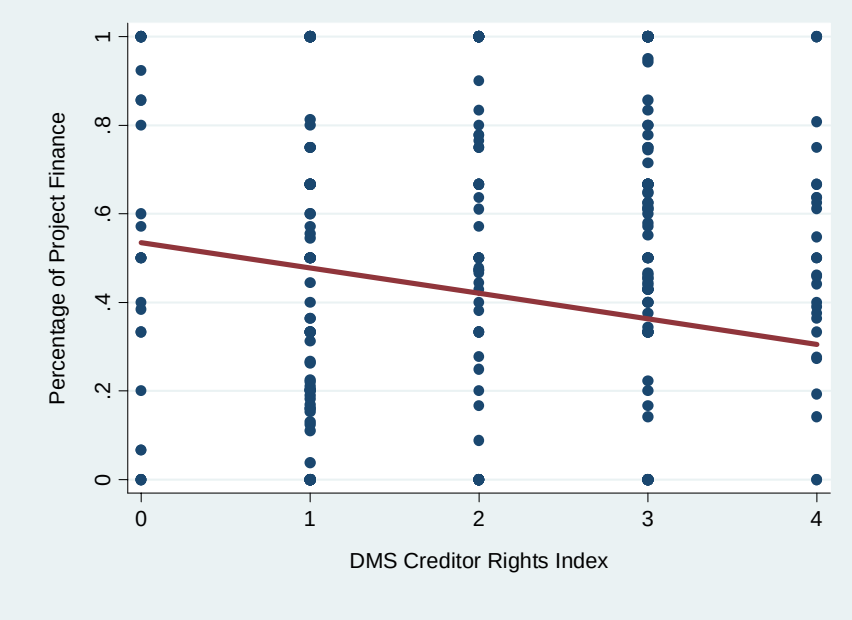


Figure 2: Percentage of Project Finance by Country versus Protection Against Insider Stealing

The y-axis plots the percentage of Project Finance deals in a country while the x-axis plots the DLLS (2006) proxy for protection against insider stealing. Higher values for the x-variable indicate greater protection against insider stealing.

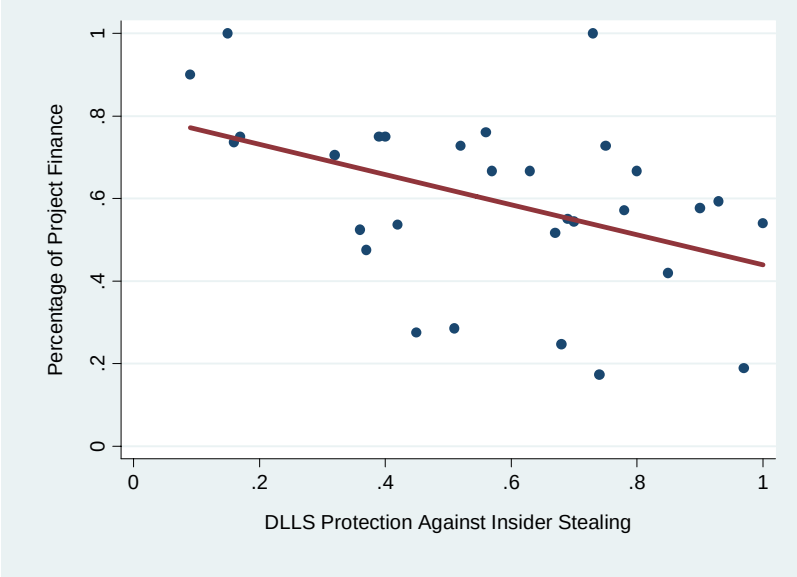
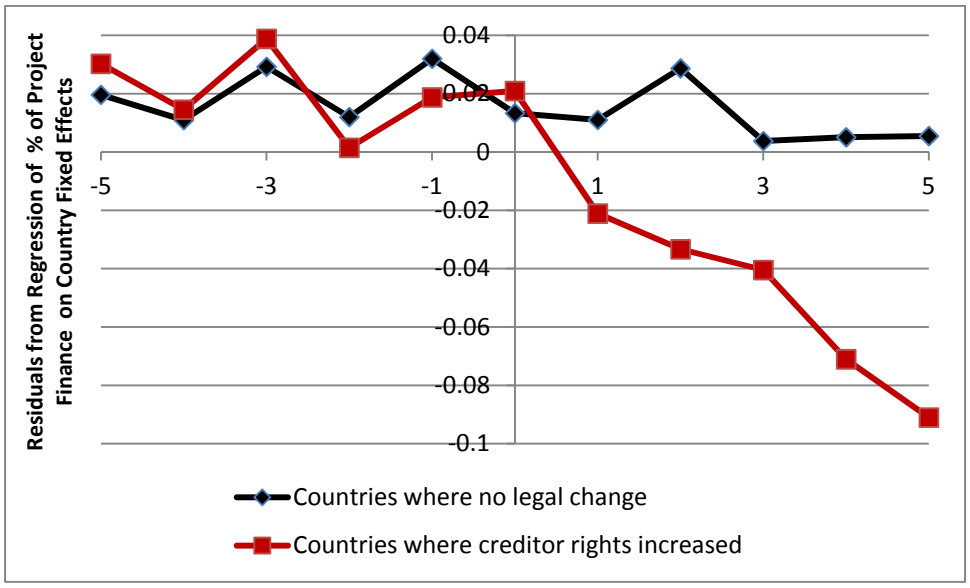


Figure 3: Effect of Exogenous Creditor Rights Changes on Project Finance

For each figure below, the y-axis plots the residuals from the regression of the percentage of Project Finance deals in a country on country and year fixed effects for: (i) countries experiencing an increase (decrease) in Creditor Rights; and (ii) countries without a change in creditor rights, i.e. the set of countries not included in panel A of table 4. The top figure shows the effect for countries with creditor rights increases, while the bottom figure shows the effect for countries with creditor rights decreases. The x-axis represents years before/after a legal change. For each country experiencing a creditor rights change, the year 0 for the control group of countries is defined as the year of the change in the treatment country. For each of the years from -5 to 5, the values for that year are averaged across the control group of countries.



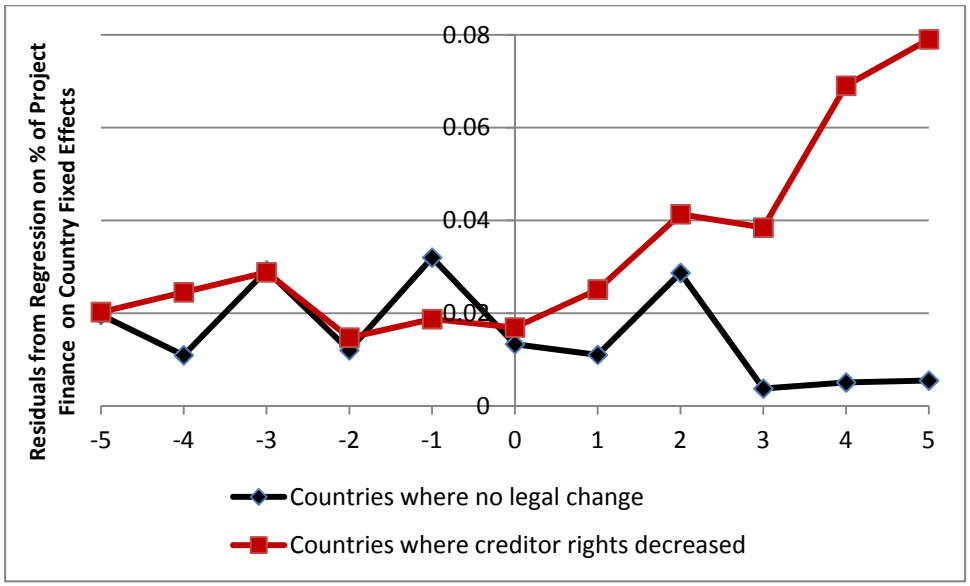


Figure 4: Effect of Exogenous Increases in Shareholder Derivative Suit Rights on Project Finance

The y-axis plots the residuals from the regression of the percentage of Project Finance deals in a country on country and year fixed effects for: (i) countries experiencing an increase in Shareholder Derivative Suit Rights; and (ii) countries without a change in rules governing shareholder derivatives suits, i.e. the set of countries not included in panel B of table 4. The x-axis represents years before/after a legal change. For each country experiencing an increase in Shareholder Derivative Suit Rights, the year 0 for the control group of countries is defined as the year of the change in the treatment country. For each of the years from -5 to 5, the values for that year are averaged across the control group of countries.

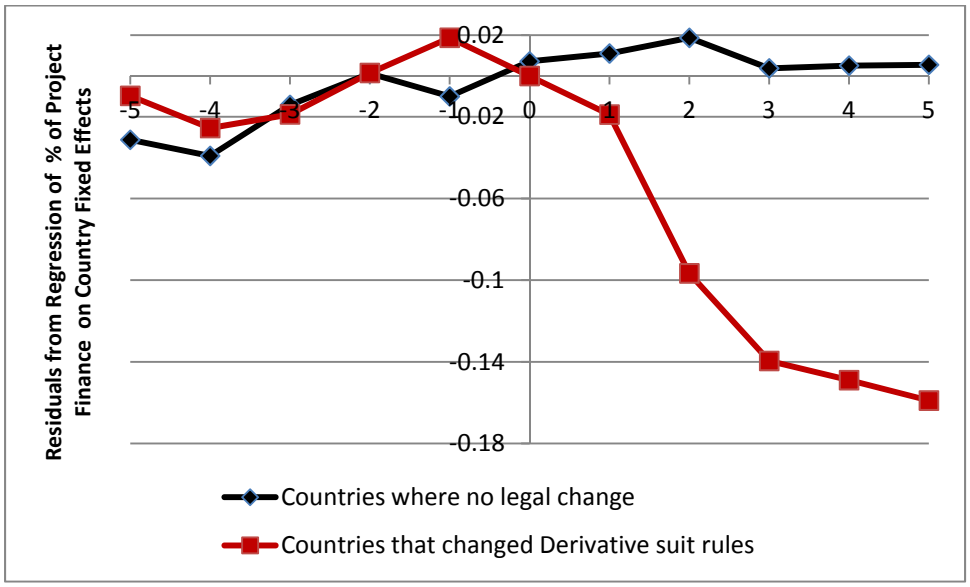


Table 1: Summary Statistics

Panel A: Features of Project Finance and Corporate Debt Finance Deals

Summary Statistic	Project Finance	Capital Expenditures	Corporate Purpose Term Loans
Observations	7763	2351	8327
Deal Amount (in $ millions)			
Mean	255.2	215.5	244.4
Median	123.9	155.0	100.0
Std. Devn.	482.2	597.9	635.1
Minimum	10	10	10
Maximum	10513.8	10586.3	10588.9
Maturity (in years)			
Mean	10.7	10.5	10.4
Median	10.6	10.5	10.4
Std. Devn.	0.7	0.4	0.4
Minimum	9.5	9.5	9.5
Maximum	20.0	12.8	12.8
Number of Lenders			
Mean	7.1	5.3	5
Median	4	3	3
Std. Devn.	7.4	6.1	6.4
Minimum	1	1	1
Maximum	50	48	97

Panel B: Project and Corporate Debt Finance Deals by Industry

Industry Description	SIC Codes	Corporate Debt Finance	Project Finance	Total	% Project Finance
Construction	15-17	188	888	1076	83%
Manufacturing	20-39	3702	1392	5094	27%
Mining	10-14	566	674	1240	54%
Real Estate, Insurance and Other Finance	60-67	1564	1121	2685	42%
Retail/Wholesale/Distributors	50-59	1127	224	1351	17%
Services	70-89	1929	727	2656	27%
Transportation	40-49	1602	2737	4339	63%

Panel C: Summary Statistics for the Main Explanatory Variables

	Observations	Mean	Std. Devn.	Minimum	Maximum
Ex-post private control of self-dealing	18257	0.87	0.19	0.09	1
Creditor Rights	18257	1.54	1.00	0	4
Change in Derivative Suit Rules	18257	0.18	0.25	0	1
Creditor Rights Change	18257	0.07	0.13	0	1
Free Cash Flow to Assets	18257	0.14	0.17	-2	2
Asset Tangibility	18257	0.35	0.37	0	1

Table 2: Distribution of Project Finance and Corporate Debt Finance by Country

	Total	Corporate Debt Finance	Project Finance	% Project Finance
English:				
Australia	884	393	521	59%
Canada	534	437	97	18%
Hong Kong	688	437	281	41%
Israel	30	19	11	37%
Ireland	145	65	80	55%
Malaysia	440	199	265	60%
New Zealand	125	60	65	52%
Singapore	294	167	127	43%
South Africa	120	56	64	53%
Thailand	386	227	159	41%
USA	5184	3461	1823	35%
United Kingdom	1992	1553	439	22%
All English Legal Origin	10822	7074	3932	36%
All English Legal Origin excluding U.S.	5638	3613	2109	37%
French:				
Argentina	146	65	81	55%
Belgium	100	55	45	45%
Brazil	108	49	59	55%
Chile	118	51	67	57%
Colombia	180	90	90	50%
Egypt	150	70	80	53%
France	118	68	50	42%
Greece	106	56	50	47%
Indonesia	562	247	315	56%
Italy	858	411	447	52%
Lithuania	30	15	15	50%
Mexico	986	463	523	53%
Netherlands	104	54	50	48%
Philippines	338	141	197	58%
Portugal	105	39	66	63%
Romania	60	28	32	53%
Spain	292	87	205	70%
Turkey	250	100	150	60%
Venezuela	190	60	130	68%
All French Legal Origin	4801	2149	2652	55%
German:				
Bulgaria	80	44	36	45%
Germany	548	317	231	42%
Japan	174	133	41	24%
Korea (South)	340	163	177	52%
Switzerland	105	70	35	33%
Taiwan	736	353	383	52%
All German Legal Origin:	1983	1080	903	46%

Scandinavian:				
Finland	112	48	64	57%
Norway	110	74	36	33%
Sweden	104	64	40	38%
All Scandinavian Legal Origin:	326	186	140	43%
Socialist:				
Azerbaijan	50	31	19	38%
Kazakhstan	30	19	11	37%
Russia	245	139	106	43%
All Socialist Legal Origin:	325	189	136	42%
All Countries:	18257	10678	7763	42%

Table 3: Key Explanatory Variables

Variables	**Description**	**Sources**
Ex-post private control of self-dealing	Index of ex-post control over self-dealing transactions. Average of disclosure in periodic filings and ease of proving wrongdoing	DLLS (2006)
Creditor Rights	An index aggregating four different credit rights: restrictions on entering reorganization, no automatic stay on secured assets, secured creditors first paid, and management is automatically ousted.	DMS (2007)
Project Finance	Equals 1 if it is a non-recourse loan to finance a specific project, 0 if the loan is a Capital Expenditure loan or a Corporate Purpose Term Loan	Dealscan
Capital Expenditure loan	A loan for capital expenditures purpose	Dealscan
Corporate Purpose Term Loan	A term loan categorized as "Corporate Purposes" in Dealscan with minimum loan amount (converted in dollars) $0.5mm	Dealscan
Free Cash Flow to Assets (U.S.)	The median measure of free cash flow divided by book value of assets, where the median is calculated for the 2-digit SIC industry for U.S. firms. Free Cash Flow to Assets is computed as net income plus depreciation and amortization minus capital expenditures and increases in net working capital	Compustat

Table 4: Countries experiencing changes in legal investor protection

The list of countries with creditor rights changes is drawn from Appendix A of Djankov, S., McLeish, C. and Shleifer, A. (2007). The list of countries with changes governing shareholder derivative suits is drawn from Siems *et al.* (2008).

Panel A: Creditor Rights Changes			**Panel B: Changes Governing Shareholder Derivative Suits**		
Country	**Year**	**Increase/ Decrease?**	**Country**	**Year**	**Description of change**
Azerbaijan	1997	Increase	Australia	2000	Instituted
Bulgaria	2000	Increase	Chile	2000	Instituted
Indonesia	1998	Decrease	Germany	1998	Minimum share ownership required for enforcing claims changed from 10% to 5%
Israel	1995	Decrease	Italy	1998	Minimum share ownership required for enforcing claims changed from 10% to 5%
Japan	2000	Decrease	Mexico	2001	Minimum share ownership required for enforcing claims changed from 33% to 15%
	2002	Increase			
Kazakhstan	1997	Increase			
	1998	Increase			
	2001	Decrease			
Lithuania	1995	Increase			
	1998	Increase			
Romania	1994	Increase			
	2003	Increase			
Russia	1994	Increase			
	1998	Decrease			
	2004	Increase			
Spain	2004	Increase			
Sweden	1995	Decrease			
Thailand	1999	Decrease			

Table 5: Difference-in-Difference Tests Using Exogenous Country-Level Legal Changes

All columns report results relating to creditor rights and changes in rules governing shareholder derivative suits. Columns 1-2 report logit results using a deal-level sample with various fixed effects. Columns 3-5 report OLS results using an industry-level sample with country, industry and year fixed effects, and using industry level averages of the deal level control variables. We compute cluster-robust t-statistics using the cluster-correlated Huber-White covariance matrix method where the clustering is done at the country level. ***, **, * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent variable is:	Prob (PF=1)		% PF	Ln (PF Loans)	Ln (PF Loans/GDP)
Sample:	Deal		Industry, Country, Year		
Regression model:	Logit	Logit	OLS	OLS	OLS
Creditor Rights	-0.054***	-0.044***	-0.072***	-0.158*	-0.075***
	(6.08)	(3.85)	(5.17)	(3.50)	(3.25)
Change in Derivative	-0.091***	-0.093***	-0.137***	-0.073*	-0.135***
Suit Rules	(4.65)	(3.83)	(4.85)	(3.26)	(3.18)
All in spread drawn	0.012	0.008	0.024	0.024	0.024
	(0.45)	(0.28)	(0.23)	(0.24)	(0.23)
Log of Deal Amount	0.004	0.002	0.027	0.027	0.027
	(0.50)	(0.22)	(0.14)	(0.14)	(0.15)
One if Secured	0.021**	0.021**	0.066**	0.095**	0.072**
	(2.29)	(2.63)	(2.54)	(2.61)	(2.56)
Maturity	0.134***	0.152***	0.165***	0.186***	0.193***
	(7.66)	(6.77)	(6.60)	(6.58)	(6.63)
One if Borrower	0.042	0.038	0.081	0.081	0.081
not rated	(1.55)	(1.30)	(1.19)	(1.20)	(1.16)
One if Senior	-0.042	-0.05**	-0.024**	-0.029**	-0.024**
	(1.70)	(2.14)	(2.08)	(2.12)	(2.08)
Free Cash Flow / Assets	0.152***	0.113***	0.165***	0.166***	0.172***
	(5.85)	(5.55)	(5.81)	(5.86)	(5.78)
Tangibility	0.124**	0.096*	0.173**	0.138**	0.125**
	(2.67)	(1.82)	(2.64)	(2.52)	(2.54)
Interest Expense /	0.012	0.005	0.048	0.048	0.048
Net Income	(1.44)	(0.59)	(1.37)	(1.36)	(1.37)
LT Debt / Total Assets	0.337***	0.23***	0.345***	0.356***	0.29***
	(4.36)	(3.70)	(4.22)	(4.35)	(4.31)
Tobin's Q	0.100	0.063	0.120	0.120	0.120
	(1.06)	(0.70)	(1.01)	(1.00)	(1.02)
LT Debt / Total Assets *	1.183***	1.017***	0.859***	1.048***	0.952***
Tobin's Q	(8.42)	(7.03)	(8.16)	(8.22)	(8.13)
Log of GDP per capita	0.181**	0.194**	0.183**	0.19**	0.188**
	(2.47)	(2.72)	(3.04)	(3.06)	(3.09)
Log of Private Credit	-0.030	-0.038	-0.064	-0.064	-0.064
to GDP per capita	(0.71)	(1.08)	(1.29)	(1.28)	(1.31)
Borrower FE	Yes	No	N/A	N/A	N/A
(Country*Industry) FE	No	Yes	No	No	No
Country and Industry FE	No	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	18257	18257	4515	4515	4515
R-squared	0.82	0.29	0.42	0.37	0.45

Table 6: Dynamic Effects

All columns examine the dynamic effects of changes in creditor rights and in rules governing shareholder derivative suits. Columns 1-2 report logit results using a deal-level sample with various fixed effects while Column 3 reports OLS results using an industry-level sample with country, industry and year fixed effects. We omit the coefficients and t-statistics for the control variables in the interest of brevity. We compute cluster-robust t-statistics using the cluster-correlated Huber-White covariance matrix method where the clustering is done at the country level. ***, **, * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)
Dependent variable is:	Prob (PF=1)		% PF
Sample:	Deal	Deal	Industry, Country, Year
Regression model:	Logit	Logit	OLS
Forwarded Creditor Rights Change	-0.004	-0.013	-0.004
	(0.71)	(1.41)	(1.04)
Contemporaneous Creditor Rights Change	-0.026***	-0.033**	-0.112**
	(3.30)	(2.66)	(2.26)
Lagged Creditor Rights Change	-0.167***	-0.086***	-0.204***
	(3.00)	(3.41)	(4.42)
Forwarded Change in Derivative Suit Rules	-0.012	-0.013	-0.007
	(1.17)	(1.40)	(1.47)
Contemporaneous Change in Derivative Suit Rules	-0.014**	-0.042**	-0.072***
	(2.65)	(2.29)	(4.18)
Lagged Change in Derivative Suit Rules	-0.147**	-0.071**	-0.135***
	(2.25)	(2.43)	(4.61)
Control variables	Yes	Yes	Yes
Borrower FE	Yes	No	N/A
(Country * Industry) FE	No	Yes	No
Country and Industry FE	No	No	Yes
Year FE	Yes	Yes	Yes
Observations	18257	18257	4515
R-squared	0.65	0.18	0.31

Table 7: Triple-Difference Tests

Columns 1 and 3 (2 and 4) report results using Free Cash Flow to Assets (Asset Tangibility) calculated for U.S. firms. Columns 1 and 2 report logit results using a deal-level sample. Columns 3 and 4 report OLS results using an industry-level sample. Each specification includes country x year as well as industry (two-digit SIC) fixed effects. We omit the coefficients and t-statistics for the control variables in the interest of brevity. We compute cluster-robust t-statistics using the cluster-correlated Huber-White covariance matrix method, clustering at the country level. ***, **, * represent statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
Dependent variable is:	Prob(PF=1)	Prob(PF=1)	% PF	% PF
Sample	Deal		Industry, Country, Year	
Regression model:	Logit		OLS	
Creditor Rights * Free Cash Flow to Assets (U.S.)	-0.427**		-0.793***	
	(2.24)		(2.85)	
Change in Derivative Suit Rules * Free Cash Flow to Assets (U.S.)	-0.613**		-0.762***	
	(2.35)		(2.96)	
Creditor Rights * Asset Tangibility (U.S.)		0.512**		0.952***
		(2.69)		(3.42)
Change in Derivative Suit Rules * Asset Tangibility (U.S.)		0.736**		0.914***
		(2.82)		(3.55)
Free Cash Flow to Assets (U.S.)	0.677*		0.757	
	(2.16)		(1.62)	
Asset Tangibility (U.S.)		0.189		0.336
		(1.18)		(1.68)
Control variables	Yes	Yes	Yes	Yes
Country x Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	13073	13073	4410	4410
R-squared	0.73	0.77	0.43	0.51

Table 8: Additional Robustness Tests

All OLS regressions employ country, year and industry fixed effects. We omit the coefficients and t-statistics for the control variables in the interest of brevity. We compute cluster-robust t-statistics using the cluster-correlated Huber-White covariance matrix method. ***, **, * represent coefficients that are statistically significant at the 1%, 5% and 10% levels respectively.

Dependent variable is:	(1) Maturity of CDF loans	(2) Cash Flow from Operations / Capital Expenditures	(3) Log (Deal Size in $m)
Creditor Rights	1.760	0.256	1.877
	(1.54)	(1.57)	(1.26)
Change in Derivative Suit Rules	1.006	0.304	1.160
	(1.12)	(1.41)	(1.32)
Control variables	Yes	Yes	Yes
Borrower FE	No	No	No
Country, industry and year FE	Yes	Yes	Yes
R-squared	0.28	0.37	0.37

Appendix to Tables: Description of Control Variables and their Sources

Variables	Description	Sources
Country Level Data		
GDP per capita	Real gross domestic product per capita	Penn World Tables
Private credit to GDP per capita	Ratio of Private credit to gross domestic product per capita	Penn World Tables
Industry-level data		
Tobin's Q	The median Tobin's Q for the 4-digit SIC industry. Tobin's Q is computed as the ratio of the Market Value of Assets to their Book Value. The Market Value of Assets is constructed as the total book value of assets minus the book value of common equity minus the book value of deferred taxes plus the market value of equity.	Worldscope
Asset Tangibility	The median net PP&E / total assets for the 4-digit SIC industry	Worldscope
Long Term Debt / Total Assets	The median long term debt divided by total assets for the 4-digit SIC industry	Worldscope
Interest Expense/ Net Income	The median of interest expense/ net income " for the 4-digit SIC industry	Worldscope
Deal-level data		
Deal amount	The commitment amount at the loan origination, in billions of dollars	Dealscan
All-in-spread	The amount the borrower pays in basis points over LIBOR for each dollar drawn down	Dealscan
Maturity	Loan maturity, in years	Dealscan
Secured	Equals 1 if the bank loan is secured by collateral, 0 otherwise	Dealscan
Senior	Equals 1 if the lenders are senior creditors, 0 otherwise	Dealscan