

**CREDITOR RIGHTS, ENFORCEMENT, AND DEBT OWNERSHIP STRUCTURE:  
EVIDENCE FROM THE GLOBAL SYNDICATED LOAN MARKET \***

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First Draft: June 27, 2000

Current Draft: June 24, 2002

Comments Welcome

\* The authors thank Yiorgos Allayannis, Viral Acharya, Malcolm Baker, Amir Barnea, Michael Fishman, Charlie Hadlock, Campbell Harvey, Kose John, Leora Klapper, Stefanie Kleimeier, Larry Lang, Josh Lerner, Scott Mayfield, John McConnell, Lalitha Naveen, Ehud Ronn, Rick Ruback, Andrei Shleifer, David Smith, Jeremy Stein, and two anonymous referees. We would also like to thank seminar participants at the European Financial Management Association (Paris), Federal Reserve Board (Washington), Federal Reserve Bank of Chicago, Florida, Harvard's Kennedy School of Government, Harvard Business School, Illinois, International Finance Conference at Georgia Tech, Kansas, London Business School, Maryland, NYU, Texas Finance Festival, World Bank, and the University of Zurich for helpful comments on earlier drafts. We also thank Fuaad Qureshi for research assistance. Finally, we are especially grateful for the financial support from the University of Oklahoma's Michael F. Price College of Business, which allowed us to purchase the *Loanware* database, and the Division of Research at Harvard Business School. An earlier version of this paper was titled, "Legal Risk as a Determinant of Syndicate Structure in the Project Finance Loan Market."

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# **CREDITOR RIGHTS, ENFORCEMENT, AND DEBT OWNERSHIP STRUCTURE: EVIDENCE FROM THE GLOBAL SYNDICATED LOAN MARKET**

## **Abstract**

This paper examines the relation between legal risk—defined as the strength and enforcement of creditors’ rights—and debt ownership concentration to understand the various governance roles played by banks as large creditors. Using a sample of 495 project finance loan tranches (worth \$151 billion) to borrowers in 61 different countries, we document high absolute levels of debt ownership concentration: the largest single bank holds 20.3% while the top five banks collectively hold 61.2% of a typical loan tranche. We also show that syndicates in countries with weak creditor rights and poor legal enforcement are larger and more diffuse. Based on this finding, we conclude that lenders structure loan syndicates to facilitate monitoring and low-cost re-contracting in countries where creditors have strong and enforceable legal rights. In contrast, lenders attempt to deter strategic defaults by creating larger and more diffuse syndicates when they cannot resort to legal enforcement mechanisms to protect their claims.

Key words: creditor rights, international corporate governance, bank lending, project finance, syndication

JEL classification: G21, G32, F34, K33

# **CREDITOR RIGHTS, ENFORCEMENT, AND DEBT OWNERSHIP STRUCTURE: EVIDENCE FROM THE GLOBAL SYNDICATED LOAN MARKET**

## **I. Introduction**

Using the power of cross-country comparisons, economists have documented a relation between legal rules and such things as corporate ownership, financing policies, and capital allocation. Early work by La Porta, López-de-Silanes, Shleifer, and Vishny (hereafter, LLSV; 1998, 2000) shows that common law systems provide stronger investor protection than civil law systems, and that stronger investor protection enables investors to hold smaller equity positions without fearing expropriation by majority shareholders or other insiders. As a result, we observe more diffuse equity ownership structures in countries with stronger investor protection (La Porta, López-de-Silanes, and Shleifer, 1999, Claessens et al., 2000). Related work shows that stronger investor protection and better legal enforcement results in larger and more efficient capital markets (LLSV, 1997), higher equity values (LLSV 2002, Claessens et al. 2002), and faster economic growth (Demirgüç-Kunt and Maksimovic, 1998; Levine, 1999; and Wurgler, 2000).

Virtually all of this research, however, has focused on shareholder rights, equity ownership, and governance by large shareholders. Yet debt markets have historically provided a much greater percentage of external finance than equity markets, at least in developed countries. Moreover, one can logically predict that legal rules (creditor rights) and enforcement should also affect debt financing policies. As a first step towards understanding this relation, we analyze how creditor rights and legal enforcement affect the structure of debt ownership using a sample of international syndicated loans. Although there is some theoretical research on the structure of debt ownership and the nature of governance by banks available to guide us, there is relatively little empirical research.<sup>1</sup> In fact, Shleifer and Vishny (1997) note that empirical research on creditor governance is one of the important holes in the corporate governance literature. While our initial objective is to document the structure of debt ownership, our ultimate goal is to improve our understanding of creditor-based governance by exploring the different governance functions banks play and how they vary as a function of country's legal environment.

Researchers assume bank lending improves corporate governance in three ways. First,

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<sup>1</sup> The theoretical work includes: Diamond (1991), Chowdry (1991), Bolton and Scharfstein (1996), and Bris and Welch (2002). The empirical work includes: Simons (1993), Preece and Mullineaux (1996), Dennis and

bankers are expected to monitor borrower performance, and intervene in an effective and timely manner in case borrower non-performance seems likely. Second, concentrated ownership of the debt claim facilitates low-cost, and thus value preserving, re-contracting in the event of default. Finally, by including a large number of creditors in a loan syndicate, banks can deter voluntary, or strategic, default by making it more costly to do. We focus on these three governance functions because they generate different empirical predictions regarding the relation between syndicate structure and legal risk. By syndicate structure, we mean the concentration and size of lending syndicates; by legal risk, we mean the degree to which creditors have legal rights and can rely on local enforcement. Following LLSV (1998) and other legal scholars (Hoffman, 1998; Walsh, 1999), we assume that civil law systems provide fewer and weaker creditor rights. We measure legal enforcement using Berkowitz, Pistor, and Richard's (hereafter BPR, 2001) composite legality index. When creditors have fewer rights, face less reliable enforcement, or both, we assume they are exposed to greater legal risk and have a lower probability of achieving a satisfactory return on their invested capital.

We believe there should be a relation between syndicate structure and legal risk, and that this relation will help us understand the governance roles played by banks. As legal risk increases, both the need for monitoring increase, because there are more opportunities for misappropriation of cash flows, and the need for re-contracting increases, because the probability of economic default increases. If either effect is at work, we should observe an increase in syndicate concentration (i.e. fewer banks and larger individual shares). Conversely, if banks are structuring syndicates to deter strategic default, then we should observe a decrease in syndicate concentration as legal risk increases (i.e. more banks and smaller individual shares). By making the syndicates larger, the lenders credibly pre-commit to a more costly restructuring process and to an expanded group of "injured" banks that will be less likely to lend in the future.

We test these hypotheses using a sample of international syndicated loans for project-financed transactions. We analyze *international* loans because they provide the necessary cross-sectional heterogeneity of legal systems and enforcement. We analyze *syndicated* loans because they exhibit a wide range of ownership structures ranging from two or three banks up to 200 banks in a pyramidal structure. Finally, we analyze *project finance* loans because governance by banks is likely to be more important in this than in other contexts. Project finance is defined by

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Mullineaux (2000), Jones, Lang, and Nigro (2000), and Lee and Mullineaux (2001).

the creation of a legally independent project company financed with non-recourse debt for the purpose of investing in an industrial asset. The reason governance by banks is important in this context is because project companies are highly leveraged entities—the average project company has a debt-to-total capitalization ratio of 70% compared to 30-35% in the average publicly-traded company (Esty, 2002a)—and they get virtually all of their debt in the form of syndicated bank loans. Both collectively and individually, syndicate members are important capital providers, having contributed more capital than most of the individual equity investors (known as sponsors). In addition, we chose to study project finance loans because they are more international than other types of syndicated loans, and because the non-recourse nature of the loan limits the scope of our analysis to the borrower-creditor contracting relationship.

Our sample includes 495 loan tranches worth a total of \$151 billion. They come from loans made between 1986 and 2000 to borrowers in 61 different countries. Using univariate analysis, we document high absolute levels of debt ownership concentration. At closing, the largest single debt provider holds an average (median) of 20.3% (14.8%) of the tranche while the top five banks hold an average (median) of 61.2% (57.3%). Although the largest share declines with tranche size, the largest single bank still holds almost 10% of tranches over \$500 million.

We also document a significant relation between legal risk and syndicate concentration: tranches in countries with weaker (stronger) creditor rights or weaker (stronger) legal enforcement exhibit less (more) concentrated ownership structures. Holding all else constant, loan tranches in civil law countries involve 3.2 more banks (for a total of 17.6 banks), compared to 14.4 banks in the average tranche in our sample. This positive relation between creditor rights and debt ownership concentration is particularly interesting because it is the opposite of the *negative* relation LLS (1999) find between shareholder rights and equity ownership concentration. Similarly, loan tranches in countries with weak legal enforcement such as Turkey contain 8.5 more banks than comparable tranches in countries with stronger legal enforcement such as Australia. These results are more significant in countries with low to medium sovereign risk, which leads us to conclude that legal considerations, rather than concerns about portfolio diversification, are driving our results. Based on this evidence, we conclude that banks act as monitors and providers of low-cost re-contracting in settings where they have stronger legal rights and can rely on legal enforcement to protect their rights and invested capital. As legal risk increases, however, their governance role shifts to one of deterring strategic defaults.

The paper is organized into four sections. In Section II, we present important institutional details about syndicated lending and the project finance loan market, and describe how this helps us test the relationship between syndicate structure and legal risk. Section III discusses our dataset and provides univariate analyses of creditor rights, enforcement, and syndicate structure variables. Our analysis on the determinants of syndicate structure appears in Section IV. We conclude with a brief discussion of our findings and their implications in Section V.

## II. Background Information and Hypotheses

Before presenting our hypotheses, we need to establish some basic facts and terminology about syndicated lending, describe project finance, and define legal risk. A bank syndicate is a collection of banks that jointly extends a loan to a specific borrower.<sup>2</sup> Unlike a loan sale to a third party in which no direct contract exists between the borrower and the buyer, syndication involves a direct contract between each member bank and the borrower (Pennachi, 1988; and Gorton and Pennachi, 1995). Lending syndicates resemble pyramids with *arranging banks* (arrangers) at the top and *providing banks* (providers) at the bottom. Prior to closing a loan, the arranging (or mandated) banks meet with the borrower, perform a credit analysis, negotiate key terms and conditions, and prepare an information memorandum for providing banks. Once the key terms are in place, the arranging banks invite other banks to participate in the deal and allocate shares to them as they see fit.<sup>3</sup> The syndication process allows us to assume that syndicate structures are endogenously determined in response to project characteristics including legal risk. After closing, the arranging banks monitor compliance with loan covenants, negotiate contingent agreements when they arise, and lead negotiations in default situations. Because the arranging banks play a more prominent role than providing banks leading up to and after syndication, we focus most of our attention on the arranging banks.

Syndicated loans are the predominant form of funding for project-financed investments. What makes project companies particularly appropriate for our analysis is that they, perhaps more than almost any other setting, are built on contractual agreements—in fact, some people

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<sup>2</sup> For a detailed analysis of loan syndication, see Esty's (2001) case study on the Hong Kong Disneyland project.

<sup>3</sup> In an underwritten deal, the process works somewhat differently. The arranging banks agree to make the loan,

refer to project finance as “contractual finance.” Prior to financing a project company, sponsoring firms sign contracts with construction firms, suppliers, customers, and host governments. Lenders, on the other hand, negotiate commitment letters, collateral packages, and loan documents with project companies, and inter-creditor agreements among themselves. This nexus of contracts is intended to ensure loan repayment when the project is solvent and loan recoverability when the project is in default (Jensen and Meckling, 1976). Typically, New York or UK law governs the financing contracts. In contrast, the operating contracts and the enforcement of security provisions (e.g., seizure of collateral upon default) depend on the legal system in the country where the project is located. As a result, lenders must understand their rights as creditors and the efficiency of local enforcement before lending in a given country.

In practice, countries vary considerably in terms of the rights they grant creditors and the efficiency with which they respect property rights and enforce contract law. For example, there is a well documented difference between civil law and common law jurisdictions in terms of investor protection. Coffee (2000) argues that common law systems provide greater flexibility to address new unforeseen situations because civil law systems are restricted to the body of current laws. Consistent with this view, LLSV (1998) show that common law countries provide stronger legal protection for both shareholders and creditors. In the context of project finance, Hoffman (1998, pp. 76-77) notes that common law countries provide greater leeway in the types of collateral that can be seized in default situations and the types of liens that can be placed on assets.<sup>4</sup> Resolving these differences, particularly when the financing documents and the collateral agreements are governed by different legal systems, is time consuming and complex. Esty (2000), in his case study of the Mozal project (a \$1.4 billion aluminum smelter in Mozambique), notes that resolving legal differences between Mozambique (civil law), England (common law), and South Africa (common law) was one of the major structuring challenges.<sup>5</sup>

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and later attempt to syndicate it to providing banks in a process known as general syndication.

<sup>4</sup> For similar reasons, Walsh (1999, p. 125) concludes, “...civil law jurisdictions restrict the security rights available to project lenders...In contrast to the civil law, the common law offers a far more expedient approach to securing assets.” As an example, civil law countries generally forbid “floating liens,” do not permit mortgages to be registered in a foreign currency, and forbid foreign entities from operating or purchasing foreclosed assets. Penrose and Rigby (2000, p. 60), two S&P analysts, claim that, “In many countries, the notion of contract supported debt remains a novelty. Little case law or civil law, for instance, exists to support the assignment of contracts to lenders as collateral. The legal system may not support the Western-style contracts so typical in project finance.”

<sup>5</sup> A second example is Esty’s (2002b) analysis of the A2 Motorway in Poland. Once again, the financing

In addition to ensuring they have legal rights, creditors must also ensure their rights are enforceable. According to Moody's (2001, pp. 47, 48):

*Project finance is typically a pyramid of contracts. In many countries, investors simply do not know if these contracts will be upheld as legal, binding, or enforceable ...these contracts are worth little more than the paper on which they are written if the host country's legal and political system cannot guarantee that they will be consistently enforced.*

Ratings reports by Fitch (2001, p. 10) and S&P (Penrose and Rigby, 2000, pp. 44-51) echo similar sentiments regarding the importance of contract enforceability. We refer to situations where creditors have few rights and/or cannot rely on local enforcement as characterized by high legal risk.

#### *A. Hypotheses Relating Syndicate Structure and Legal Risk*

We hypothesize that legal risk affects the way banks perform their primary governance functions, and that banks will adjust syndicate structure in response to legal risk to facilitate their various governance roles. According to previous research, banks have three primary governance functions. First, as described in Diamond (1984) and Fama (1985), they provide valuable *monitoring* services. Subsequent empirical research by James (1987), Lummer and McConnell (1989), and Dahiya, Puri, and Saunders (2001) on the returns associated with new loan agreements, and by De Long (1991) and Hoshi, Kashyap, and Scharfstein (1991) on the relation between firm performance and bank finance, validates the effectiveness of bank monitoring.<sup>6</sup>

Second, they facilitate low-cost *re-contracting* in the event of default. Bolton and Scharfstein (1996) and Gertner and Scharfstein (1991) present theoretical models showing that small groups of banks are able to restructure firms faster and more cheaply than large groups of public bondholders can. Consistent with these models, Gilson, John, and Lang (1990) report that the time and cost of restructuring increases as the number of creditors increases, yet declines

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documents were governed by UK common law, but enforcement ran through Polish civil law. One difference between the two systems was that Polish law did not allow interest on interest in default situations.

<sup>6</sup> Rajan (1992), Kang and Stulz (2000), and Weinstein and Yafeh (1998) highlight the disadvantages of bank control, namely the danger of getting locked into banking relationships. Because project finance involves a one-time transaction rather than an on-going relationship, and involves multiple rather than single creditors, concerns regarding lock-in are less relevant in this setting.

with the fraction of bank debt. Further research by Preece and Mullineaux (1996) shows that the positive abnormal return associated with new bank loan announcements is negatively related to syndicate size, which they assert shows that increased renegotiation costs gradually offset monitoring benefits as syndicate size increases. Low-cost re-structuring is very important in the context of project finance because projects involve dedicated assets with going concern, but little salvage value. As a result, asset liquidations are rare and restructurings are the norm (see Hoffman, 1998, p. 656). Knowing that restructuring is the likely course for a defaulted project, lenders rationally structure syndicates to minimize restructuring costs.

Bolton and Scharfstein (1996) aptly point out that low restructuring costs can, perversely, encourage borrowers to default strategically. Lenders can discourage strategic defaults by intentionally making such discretionary acts very costly to the borrowers. One way to discourage strategic default is to increase the number of creditors in a syndicate, thereby creating a more costly restructuring process and pre-committing to imposing costs on the strategic defaulter (Gertner and Scharfstein, 1991; Diamond, 1991; and Bolton and Scharfstein, 1996). A second way to make default more costly is to impose a penalty on defaulting firms. In Chowdry's (1991) model of sovereign lending, banks threaten to withhold future lending. He assumes that banks can credibly commit not to lend in the future (after a default) only if they have previously lost money to a particular borrower. Thus, as you increase syndicate size, you reduce the pool of potential creditors willing to lend to a defaulting borrower at some point in the future. Of course, the defaulting borrower must depend on external finance for this threat to be credible. For projects with little on-going funding needs, this form of deterrence may be less effective. It may, however, be effective against sponsoring firms that rely on external finance to fund their capital expenditures.

We focus on these three governance functions—monitoring, re-contracting, and deterrence—because they generate different empirical predictions regarding the relation between syndicate structure and legal risk. To test for such a relation, we present three hypotheses, though readily admit that observed structures represent complex combinations of these and other factors. The *monitoring hypothesis* predicts that banks will hold larger shares, resulting in smaller and more concentrated syndicates, when monitoring is needed and valuable. Banks with larger positions have less incentive to free ride on the monitoring of others. While we expect monitoring to be more important in countries with high legal risk—there is greater opportunity

for misappropriation of cash flow—there is an offsetting effect: banks have fewer legal rights and cannot rely on enforcement. Thus we expect more concentrated lending syndicates in countries with low legal risk where detection of problems can lead to corrective actions through legal mechanisms. In countries with high legal risk, however, the empirical prediction is not clear. Nevertheless, an increase in syndicate concentration particularly among the arranging banks would be consistent with an attempt to improve monitoring incentives. The *low-cost re-contracting hypothesis* similarly predicts that banks will choose more concentrated loan syndicates to reduce re-contracting costs when the probability of economic default is higher. By definition, low-cost re-contracting is similar to monitoring in that it relies on the existence of legal rights and the enforcement of contracts. For this reason, we predict more concentrated syndicates in countries with low legal risk, and would view a positive relation between increases in legal risk and debt ownership concentration as being consistent with the re-contracting hypothesis (as well as the monitoring hypothesis). Finally, the *deterrence hypothesis* predicts the opposite: there should be a negative relation between legal risk and debt ownership concentration. Banks, knowing they have few legal rights and cannot rely on local enforcement, attempt to deter strategic default by making it more costly to default. They can make voluntary default costly by choosing more diffuse ownership structures. Of course, lenders must be mindful of the potential for economic defaults in which case they themselves will bear the incremental restructuring costs. This concern, combined with the fixed costs of underwriting a loan, prevents them from expanding the syndicate size (or decreasing the concentration) too far.

### **III. Data and Methodology**

Our sample of syndicated loans comes from Capital Data's (now Dealogic) Loanware database, which contains information on more than 85,000 syndicated loan tranches made between 1980 and April 2000.<sup>7</sup> We begin with the 6,505 loan tranches designated as project

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<sup>7</sup> Although comprehensive in many ways, the Loanware database has two shortcomings for our purposes. First, it provides detailed project and limited sponsor information only after 1995, and even then on an apparently random basis. As a result, we are unable to collect potentially interesting data items such as project leverage or sponsor characteristics. Nor are we able to collect information about the lenders other than name and participation levels. Second, the loan data is incomplete, which reduces our sample size because most observations lack syndicate share and pricing information.

finance loans, and then apply three screens to obtain the final sample. First, we exclude all bilateral loans—loans between a single bank and a borrower. Second, we exclude tranches less than \$75 million as a way to limit the sample size because all of the data must be hand collected.<sup>8</sup> We also exclude the smaller tranches because they have simpler structures: the median number of banks in tranches under \$75 million is three compared to five banks for tranches from \$75-\$85 million and 20 banks for tranches greater than \$250 million. To determine if this selection criteria induces a bias against risky countries, we test for and reject the hypothesis that syndicates are smaller in countries with high sovereign or legal risk. And third, we require that the database contain complete syndicate share information so that we can analyze the structure of the syndicate. The presence of syndicate share information, however, is not related to either tranche size or signing date. After applying these three screens, our final sample consists of 495 tranches for loans to borrowers in 61 different countries. Because the unit of observation is a loan tranche, multiple tranches from the same loan appear as separate observations in our database—there are 468 different loans, 22 of which have multiple tranches in our dataset (446 loans have a single tranche while 22 loans account for 49 tranches). Thus, most observations are independent.

Given the reported dollar investment made by each bank at closing, we manually calculate several concentration measures for each tranche, including the Herfindahl-Hirschman Index (HHI)<sup>9</sup>, the share of the five largest participating banks (five-bank concentration ratio, CR5), the largest single bank share (CR1), and the total share held by arranging banks. We define arrangers to include any bank that is listed as a mandated arranger, arranger, or co-arranger in the database. Because Loanware reports syndicate structure as of the closing date, we are unable to track what happens to ownership after the loan has closed.<sup>10</sup> As part of this process, we calculate syndicate size in terms of the number of total banks, number of arranging banks, and number of providing banks. Finally, we collect information on loan pricing, loan characteristics (signing date, tranche size, maturity, whether the loan was secured or guaranteed,

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<sup>8</sup> Altman and Suggitt (2000) use a \$100 million threshold in their analysis of syndicated loan default rates.

<sup>9</sup> The HHI is given by the formula  $HHI = \sum_{i=1}^N S_i^2$  where  $S_i$  is the dollar share of the  $i^{th}$  bank. Other studies of corporate governance use the Herfindahl index to measure the concentration of control rights (see, for example, Demsetz and Lehn, 1985; or Gorton and Schmid, 2000).

<sup>10</sup> Although arranging banks can and occasionally do sell down their positions after closing, they usually retain meaningful positions. In personal interviews with bankers and traders, they are very aware and concerned about

and whether it was a refinancing), and project characteristics (industrial sector and location). To control for sovereign risk, we collect the most recent *Institutional Investor* country credit rating (II RATING) prior to closing—the scale runs from zero (high risk) to 100 (low risk).

*Institutional Investor* publishes ratings twice per year based on a survey of international bankers.<sup>11</sup> The ratings are forward-looking estimates of sovereign debt capacity and repayment probabilities. As a word of caution, it is important to remember that the II RATING is an inverse scale so that country risk decreases as the II RATING increases.

**Table 1** presents the geographic distributions for the full listing of all PF loans and for our final sample of 495 loan tranches. Consistent with Kleimeier and Megginson's (2000) analysis of syndicated lending, we find that project loans are predominantly international credits, yet the U.S. and U.K. account for 15.1% and 9.5%, respectively, of the number of loans in our final sample. Although our sample corresponds to the full database of PF loans, we are somewhat surprised at the relative absence of loans from South American projects.

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

For our final sample, we gather data on the legal rules and enforcement in the countries where the projects are located. We measure creditor and shareholder (anti-director) rights using LLSV's (1998, 1999) indices. The creditor rights index runs from 0 (weak protection) to 4 (strong),<sup>12</sup> but suffers from two problems: it is based on a single point in time and it yields some counter-intuitive results. For example, the US, Canada, and Australia are classified as having weak creditor rights while South Korea, Indonesia, and Egypt are classified as having the strongest creditor rights. A more general classification scheme based on legal origin—common vs. civil law—yields more intuitive results and is more consistent with legal research on creditor rights: the US, Canada, and Australia are all common law countries while South Korea, Indonesia and Egypt are civil law countries. We measure the strength of a country's legal system using BPR's (2001) legality index, which is a summary statistic from a principal components analysis on five measures of legal enforcement: effectiveness of the judiciary, rule

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signaling effects associated with selling down loans they originated. In general, trading is relatively infrequent.

<sup>11</sup> This rating is based on assessments from 75 to 100 leading international banks. The responses are weighted by a formula that gives greater weight to banks with more global exposure and better country analysis systems.

<sup>12</sup> LLSV (1998, p. 1135) award one point if there is no automatic stay on assets, secured creditors get paid first, there are restrictions on reorganizations, and if management does not stay in reorganizations.

of law, risk of contract repudiation, absence of corruption, and risk of expropriation. The index runs from 8.51 for the Philippines to 21.91 for Switzerland, and covers the same 49 countries in the LLSV (1998) analysis.

Having described the data and defined the key variables, we now present summary statistics. **Table 2** presents four panels describing project characteristics, legal environment, syndicate structure, and loan pricing variables. To illustrate the importance of size effects, we report results for all 495 loan tranches greater than \$75 million in size and for the 74 loan tranches greater than \$500 million in size.

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

#### *A. Project and Tranche Variables*

Panel A of **Table 2** provides general information about the projects and loan tranches in our sample. Because project data is available for only a limited number of observations, the sample sizes drop from 495 to as low as 45 observations for some variables. For the full sample, the average (median) tranche size is \$304 (\$180) million and is part of a project costing \$820 (\$586) million. Panel A also confirms our earlier assertion that projects are highly leveraged transactions. Projects have an average (median) debt-to-total capitalization ratio of 69.4% (70.7%), and the tranches provide 47.8% (43.8%) of total capital. The average tranche matures in just over nine years and is in a country with an II Rating of 68.5. For purposes of comparison, New Zealand, Iceland, and the United Arab Emirates had 1999 II Ratings of 74.0, 67.8, and 63.2, respectively. More than 10% of our tranches are in countries with risk ratings below 44.0; Egypt (45.4), India (44.3) and Argentina (42.4) had 1999 II Ratings at this level. In terms of size effects, the tranches over \$500 million are from projects with slightly lower leverage, but longer maturities (neither is statistically significant).

#### *B. Legal Risk Variables*

Panel B of **Table 2** presents descriptive statistics for our creditor rights and enforcement indices. The LLSV (1998) creditor rights index shows that the average score is 2.4 on a scale from 0 to 4. Larger tranches tend to be in countries with stronger creditor rights: the median index is 3.0 compared to 2.0 for the full sample. When it comes to the shareholder rights index,

both the means (3.8 for the full sample, 4.1 for the larger loans) and medians (4.0 and 4.1) are approximately equal. Finally, the BPR legality index has an average score of 17.6 and a standard deviation of 4.0, which indicates there is significant heterogeneity across our sample in terms of enforcement. Larger projects tend to be located in countries with stronger legal enforcement.

### *C. Syndicate Structure Variables*

Panel C of **Table 2** presents a description of syndicate structure. We find that debt ownership is highly concentrated. On average, the single largest bank holds an average (median) of 20.3% of the tranche (14.8%), the five largest banks hold 61.2% (57.3 %), and the average Herfindahl-Hirschman Index is 14.9% (10.25%). It is not necessarily surprising that the top 5 banks cluster near 60% because waivers of loan terms typically requires approval from banks controlling at least 60% of the outstanding principal. When you consider that loan tranches represent on average 47.8% of total project capital, the largest single lender is providing almost 10% of the total capital provided by all banks. In dollar terms, the largest single bank holds an average of \$61.7 million while the top five banks hold a total of \$186.0 million.

There are noticeable size effects across the two samples: the single largest (top five) bank share declines from 20.3% (61.2%) for all tranches greater than \$75 million to 9.6% (36.7%) for the tranches greater than \$500 million. With regard to the average arranger share, it falls from 16.7% to 7.0% as you move from the full sample to the largest tranches. What is more surprising is the fact that the total arranger share does not decline much as size increases: the average total arranger share falls from 39.2% to 34.2%. The reason total arranger share is relatively invariant to size is that the number of arrangers increases from 3.6 banks in the average tranche to 5.8 banks in the largest tranches.

### *D. Loan Pricing Variables*

Panel D of **Table 2** describes loan spreads and fees for the loans used in this study. In terms of loan fees, the median commitment fee (the fee charged for making funds available) and the median Undrawn Return (the sum of all fees paid assuming the borrower does not draw down any of the loan proceeds) are both approximately 30 basis points. In terms of loan spreads, we collect the spreads over various base lending rates such as LIBOR, HIBOR (Honk Kong) and

SIBOR (Singapore). The median loan spread is 102.5 basis points. Finally, we collect the Drawn Return (the sum of fees and spreads assuming the loan is fully drawn). The mean and median drawn returns are 132.2 and 122.2 basis points, respectively. The fees and spreads are slightly smaller for the larger tranches. As a caveat, note that loan pricing data is reported far less frequently than other data items, which limits our sample size in later analysis.

In summary, this analysis shows that projects are highly leveraged transactions, that project debt is highly concentrated, and that size has a major effect on debt ownership concentration. The analysis also shows there is significant heterogeneity in both legal and sovereign risk as well as in syndicate structures. We now attempt to explain the determinants of syndicate structure using regression analysis, with particular attention being paid to the role of creditor rights and enforcement efficiency.

#### **IV. The Determinants of Syndicate Structure**

This section examines the relation between syndicate structure, creditor rights, and legal enforcement using two sets of Tobit regressions. In the first set of regressions, we use syndicate concentration as the dependent variable. We measure concentration in six ways: Herfindahl Index, largest single bank share, combined share of the top five banks, total arranging bank share, average arranging bank share, and average providing bank share (we do not include total providing bank share because it is the complement of total arranging bank share). In the second set of regressions, we use syndicate size (measured as the number of total banks, number of arrangers, and number of providers) as the dependent variable. While syndicate concentration and size are clearly related, they differ in important ways. The concentration variables incorporate bank-specific shares in a measure of combined ownership. In contrast, the size variables do not distinguish between banks other than by type (arranger vs. provider)—all banks count as a single observation. Moreover, the concentration measure allows us to analyze monitoring intensity as a motivation for syndicate structure under the assumption that incentives are correlated with fractional holdings while the size measure allows us to analyze the re-contracting and deterrence functions under the assumption that restructuring costs increase with syndicate size. We use a Tobit specification because the data are censored: loan shares run between 0% and 100% while the number of banks is limited below.

The key independent variables are our measures of legal risk. We use a CIVIL LAW dummy variable to measure creditor rights—it equals one for civil law countries, indicating weaker creditor rights, and zero for common law countries. The BPR LEGALITY INDEX measures legal enforcement. We also include LLSV’s SHAREHOLDER (anti-director) RIGHTS as an independent variable for two reasons.<sup>13</sup> On the one hand, stronger shareholder rights could be a measure of shareholder monitoring, which, in turn, could be a substitute for creditor monitoring. On the other hand, stronger shareholder rights could be used against creditors. With limited power against shareholders, creditors might resort to high-cost re-contracting (diffuse ownership) as the only way to curb abusive use of powers. Both explanations predict a negative relation between debt concentration and shareholder rights. Furthermore, the correlation between shareholder and creditor rights is very low: the correlation is 11% for the 49 countries in the LLSV (1998) sample.

The independent variables control for tranche characteristics, project characteristics, and sovereign risk. In particular, the tranche variables are: SIZE (the *inverse* of tranche size, in millions of US dollars); MATURITY (tranche maturity, in years); and dummy variables equal to one for REFINANCED, GUARANTEED, and SECURED loans. We also include an AGENCY PARTICIPATION dummy variable equal to one when a multi- or bi-lateral agency such as the International Finance Corporation (IFC) or the U.S. Export-Import Bank (US Exim—an export credit agency) is involved in the deal. These agencies help facilitate lending in high-risk settings and help deter sovereign interference. They participate as equity investors, lenders, and guarantors. Their involvement not only suggests a higher level of ex ante sovereign risk, it also indicates a lower level of ex post project risk.

The project variables include J.P. Morgan’s Emerging Markets Bond Spread (a weighted index of spreads used to measure lending conditions in emerging markets) and industry sector dummy variables. We do not include other information on the sponsors due to the non-recourse nature of the loan. Without doubt, other project characteristics are important. For example, whether a project contains a long-term, off-take (purchase) contract or a fixed-price, turnkey construction contract has a major effect on the overall level of risk. The Loanware database does not include this information nor can we get it from the proprietary loan documents supporting

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<sup>13</sup> The nature of project finance largely precludes investment-related distortions such as risk shifting or under-

each deal. The fact that most project companies are private (not listed) firms severely hinders data collection. To address this problem, we create a new variable using the loan spread to measure residual project risk. We first regress the loan spread on all of the independent variables using an OLS specification (results not shown), and then calculate a LOAN PRICING RESIDUAL for use in the Tobit regressions on syndicate structure. The idea is that the regression residual will be a proxy for unobserved project risk: high positive residuals indicate high, unmitigated project risk. In an attempt to distinguish between sovereign and project risk, we include the II RATING as a measure of sovereign risk in both the loan pricing and syndicate structure regressions. We also include a dummy variable for tranches in the US because they account for 15.2% of our sample, and because the US has a large bond market available for borrowers. Similar dummy variables for tranches in other countries are not significant.

Although we run Tobit regressions that treat the independent variables as exogenous, several of them, particularly the tranche variables, are likely to be endogenous. As robustness checks, we run a series of simultaneous equation regressions with up to three dependent variables (maturity, loan pricing, and syndicate structure). Despite lacking truly exogenous variables, which are needed to identify the equations, the regressions (results not shown) produce coefficients that are similar in sign, magnitude, and significance to the results in our Tobit regressions presented below. We also run the Tobit regressions with just the country and legal risk variables, the ones most likely to be exogenous. Again the results (not shown) are similar.

#### *A. Syndicate Concentration and Legal Risk*

**Table 3** presents the results on the relation between loan concentration, creditor rights, and enforcement. Based on the Chi-square statistics, all of which are significant at the 1% level, the regressions explain a significant amount of variation in syndicate structure. Unfortunately, data restrictions reduce the sample from 495 tranches to approximately 300 tranches. We are, however, unable to detect statistical differences for any of the key variables when we compare the tranches included in the regression analysis against those that are excluded from it.

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

In almost all of the regressions, the creditor rights and legal enforcement variables are

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investment (debt overhang) because projects require little on-going investment (most investment occurs upfront).

significant. The CIVIL LAW dummy variable is negative and significant, which implies that tranches in civil law countries (weaker creditor rights) are less concentrated. Importantly, the coefficients are economically meaningful, as well. For example, the coefficient is - 0.037 for the largest single bank share. When you consider that the largest single bank share holds on average 20.3% of the total tranche (see **Table 2**), the 3.7 percentage point decline for tranches in countries with weak creditor rights equals a 18.2% reduction. Judged against the median value for the largest single bank share of 14.8%, the decline is 25.0%. Similar calculations for the average Herfindahl Index and total arranger share show declines of 29% and 45%, respectively, in civil law countries. The existence of a *positive* relation between creditor rights and debt ownership concentration stands in contrast to the *negative* relation between shareholder rights and equity ownership concentration found by LLSV (1998).<sup>14</sup> The BPR Legality Index is positive and significant in five out of six regressions, which indicates that debt becomes more concentrated and individual banks are willing to hold larger shares as legal enforcement improves. Moving from a country like Turkey with an index rating of 11.84 to a country like Australia with a rating of 20.44 (the inter-quartile range), increases the largest single bank share by 9.5 percentage points. This change represents a 42% increase over the average share held by the largest single bank. These findings are consistent with the idea that banks structure syndicates to facilitate monitoring or low-cost re-contracting in countries where they have stronger rights and more reliable enforcement mechanisms. However, when banks have fewer rights or face less certain enforcement, they decrease syndicate concentration to deter strategic defaults.<sup>15</sup> An alternative interpretation, discussed below, is that banks choose to hold smaller portions of riskier loans because of portfolio diversification concerns.

Of the other variables, shareholder rights, agency participation, size, and sovereign risk are all significant in at least three regressions. The SHAREHOLDER RIGHTS variable is negative and significant, which is consistent with either of two propositions: first, that shareholder and creditor monitoring are substitutes or, second, that creditors protect themselves from stronger shareholders by making strategic default more costly. We cannot econometrically

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<sup>14</sup> Ongena and Smith (2000) find that firms maintain fewer and, presumably, larger banking relationships in countries with strong creditor rights and effective legal systems.

<sup>15</sup> We are unable to determine whether the deterrence comes from credible threats to withhold future lending [Chowdry's (1991) explanation] or from increased restructuring complexity [Bolton and Scharfstein's, (1996) explanation].

distinguish between these two propositions. The positive coefficient on the AGENCY PARTICIPATION dummy variable indicates that banks hold larger shares and that syndicates are more concentrated when one of these agencies participates in the deal. The positive coefficient on the SIZE variable (inverse of size) implies that larger tranches are less concentrated (consistent with **Table 2**). The II RATING variable is negative and highly significant in all but one regression. Given this variable's scale (high ratings imply low sovereign risk), a negative coefficient means that ownership concentration *increases* in countries with high sovereign risk, and that the arranging banks hold larger shares of riskier loans. Perhaps more interestingly, we see that even the providing banks hold larger shares of loans in riskier countries. While limited lending capacity in high-risk markets could explain this finding, it is consistent with other research on syndicated lending. Simons (1993), Dennis and Mullineaux (2000), and Jones, Lang, and Nigro (2000) find that arranging banks retain larger shares of riskier syndicated loans, and attribute this finding to agency concerns about adverse selection.<sup>16</sup> Gorton and Pennachi (1995) find the same thing in the case of loan sales. Apparently, reputation alone is not sufficient to mitigate concerns about adverse selection.<sup>17</sup> Our finding of greater concentration and larger individual loan shares in high-risk countries is not consistent with a diversification motive.

#### *B. Syndicate Size and Legal Risk*

**Table 4** presents the results on the relation between syndicate size and creditor rights, and largely mirrors the results in **Table 3**. Using a similar Tobit specification, we find that the regressions have a high degree of explanatory power: the chi-square statistics are all significant at the 1% level. The CIVIL LAW (weak creditor rights) dummy variable is positively related to the number of total banks and providing banks, but negatively related to the number of arranging banks. In other words, syndicates are larger in civil law countries because there are more providing banks. On average, tranches in civil law countries contain 3.2 more total banks (4.8

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<sup>16</sup> Increasing ownership also resolves adverse selection problems in equity transactions (see Leland and Pyle, 1977; Admati and Pfleiderer, 1994; and Lerner, 1994).

<sup>17</sup> While the evidence is consistent with agency explanations, we cannot distinguish between adverse selection or moral hazard as a motivating force. If we had post-closing ownership data, e.g. after any sell-down had occurred, then we might be able to distinguish between the two explanations. Adverse selection would predict high original ownership while moral hazard would predict high on-going ownership.

more providing banks) than an equivalent tranche in a common law country. Considering the average tranche has 14.4 banks (see **Table 2**), this represents a 22% increase in the total number of banks. Similarly, weak enforcement results in larger syndicates. Moving from Australia with a rating of 20.44 to Turkey with an index rating of 11.84 increases the total number of banks by 8.4 banks. This represents a 58% increase in syndicate size.

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

This evidence is again consistent with only the deterrence function. In countries with weak creditor rights or weak enforcement, syndicates are larger and banks hold smaller shares. Clearly this increase in syndicate size runs contrary to a desire to facilitate low-cost re-contracting. The results also appear to refute the monitoring hypothesis. At first, the finding that there are fewer arranging banks in situations with weak creditor rights appears to be consistent with a desire to enhance monitoring incentives—having fewer lead banks (arrangers) would reduce free-riding. The arrangers, however, hold smaller shares in these settings (**Table 3** shows the average arranger share falls by 5.7% off an average holding of 16.7%, see **Table 2**), which would reduce monitoring incentives. Once again, this evidence seems most consistent with the idea that banks monitor when monitoring can be effective (i.e. in low legal risk settings), and resort to deterrence in situations where legal recourse is in doubt.

An alternative interpretation of the negative (positive) relation between legal risk and syndicate size (concentration) is that lenders structure syndicates to diversify their exposure to legal risk rather than to deter strategic defaults. Because the results reflect a net, not a gross, benefit of a given syndicate structure, both factors are certainly relevant, and we cannot definitively distinguish between them. We address this issue first indirectly by examining sovereign risk and then directly by examining legal risk. To begin with, the results are not consistent with banks attempting to diversification away sovereign risk. In fact, both arranger loan shares and overall concentration increase, and portfolio size decreases, as sovereign risk increases (II rating falls). Interestingly, even providing banks, the ones presumably most interested in diversification because they are smaller, hold larger shares of riskier loans (see **Table 3**)—we discuss the possibility of capacity constraints in the next section.

Additional evidence against a pure diversification explanation for the observed positive relation between legal risk and syndicate size comes from the impact of multi-lateral agency

participation in a loan. Given the positive relation between syndicate concentration and sovereign risk documented above, one would expect the presence of a multi-lateral agency (AGENCY PARTICIPATION dummy variable) to reduce sovereign risk and, therefore, reduce concentration. Yet the opposite happens: there are fewer banks and they hold larger positions when an agency also participates in a transaction. In contrast, one would expect this result based on deterrence motives. Multi-lateral agencies such as the IFC and European Bank for Reconstruction and Development (EBRD), as lenders of last resort, deter strategic defaults and help resolve complicated legal issues. In other words, they lower legal risk and reduce the need for syndicate-based deterrence. Consistent with our findings on the effects of creditor rights and enforcement, agency participation results in greater concentration.

To verify this result, we reran the regressions in **Tables 3** and **4** after eliminating the tranches in high-risk countries (the bottom quartile). The negative relation between legal risk and syndicate concentration is significant for the low- and medium-risk countries, but insignificant for the high-risk countries. Finally, we examine the magnitude of the changes to shed light on the diversification vs. deterrence question. In civil law countries, syndicates contain up to 50% more providing banks. This dramatic increase in size complicates restructuring efforts. In contrast, the average providing bank cuts its holdings by \$5.5 million compared to an average holding of \$28.3 million—a 19% decline. For the large banks that participate in the syndicated loan market, the diversification benefits resulting from a relatively small reduction in loan amounts, especially compared to a multi-billion dollar loan portfolio, seem small compared to the deterrence benefits created by increasing the syndicate size by 20-50%. Nevertheless, we believe the net change incorporates both deterrence and diversification effects.

Of the remaining variables, the coefficients on SIZE are negative and significant (larger tranches include more banks), on MATURITY are negative and significant (longer maturity tranches have more banks), and on the US dummy variable are negative and significant (US tranches are smaller). Consistent with earlier results, we observe a positive coefficient on II RATING at least in Regressions #1 and #3. Holding creditor rights and enforcement constant, this finding implies smaller syndicates in countries with higher levels of sovereign risk. One interpretation of this finding is that projects exposed to higher levels of sovereign risk may be more subject to *liquidity* defaults, caused by temporary imbalances between cash inflows and

outflows. As a result, bankers want to ensure rapid approval of covenant waivers in the event of minor problems or low-cost restructuring in the event of more serious problems.

### *C. Sensitivity Analysis*

We run sensitivity analyses to ensure the results in **Tables 3** and **4** are robust to alternative independent variables and regression specifications. With regard to the independent variables, we replace the II RATING with International Country Risk Guide's (ICRG) composite rating,<sup>18</sup> the inverse of tranche size with the natural logarithm of size in millions, and year dummy variables with the JP Morgan Emerging Markets Bond Index, all without changing the basic results. Instead of the BPR legality index, we try the various components (legality, enforcement, and corruption variables) from LLSV (1998), both individually and in combination. The problem with this approach is that the variables are highly correlated, which is exactly why BPR did the principal components analysis in the first place. For this reason, the composite legality index provides more meaningful results. We also change the sample period by including only tranches from 1990 to 2000, and the regressions' specifications by running a fixed effects specification to control for inclusion of loans with multiple tranches. Again, the key results remain intact. Based on this analysis, we conclude that our primary finding, that syndicates are larger (more banks participating) and less concentrated in countries characterized by weak creditor rights or weak enforcement, is robust.

Although we believe our secondary finding—that syndicates are smaller and more concentrated in countries with greater sovereign risk—is largely due to agency and re-contracting concerns, an alternative explanation based on restricted lending capacity in high-risk countries could also explain this finding. Because lending to projects in high-risk countries is a complex activity requiring specialized underwriting skills, only a limited number of banks participate in this market. By necessity, syndicates are smaller and more concentrated in these markets.

We test the capacity hypothesis in several ways. First, we spoke with project finance bankers and loan arrangers who told us that limited lending capacity is, indeed, an issue in high-risk countries. To test this assertion, we analyze the number of banks involved in a typical

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<sup>18</sup> The PRS Group (Political Risk Services) publishes the ICRG ratings. They provide a composite rating based

syndicate and compare that number against the total number of participating banks for each II Rating decile. In all but the most risky deciles of the II Rating spectrum (the two lowest deciles with ratings from 0 to 10 and from 11 to 20), fewer than 10% of the available banks participate in any given tranche. For example, 211 different banks participate in syndicates for loans made in countries with an II Rating between 20 and 30.<sup>19</sup> Yet according to **Table 2**, the average syndicate has only 11 providing banks, which means that almost 95% of the available banks do not participate. Based on this and other analysis (not shown), we conclude that capacity constraints bind only in the most risky countries (II ratings below 20 or so) though they probably have some impact in countries with moderate sovereign risk. Even if we remove all the observations from riskiest quintile of our dataset, the basic result holds: both arranging banks and providing banks hold larger shares in riskier countries.

The apparent robustness of the positive relation between sovereign risk and syndicate concentration raises an interesting question. Why would banks respond to greater *legal* risk with larger, less concentrated syndicates, but respond to greater *sovereign* risk with smaller, more concentrated syndicates. One explanation may be that the banks are trying to address different kinds of problems. Legal risk exposes banks to strategic defaults, which they try to deter by increasing syndicate size. The presence of sovereign risk, on the other hand, creates two kinds of problems. First, there are greater concerns about adverse selection because it is more difficult to assess sovereign risk *ex ante* than it is to assess legal risk. Compare the following two questions: is Peru likely to expropriate project cash flows (sovereign risk) vs. is Peru a civil law country (legal risk). Second, sovereign risk may be a proxy for the probability of economic or liquidity defaults. For example, a project may default for sovereign reasons (e.g. currency inconvertibility) rather than strategic reasons (e.g. managerial theft). When facing an economic default, lenders want smaller syndicates to ensure low-cost re-contracting because they bear the economic consequences. In summary, we believe that syndicate structure reflects a complex interaction of capacity considerations, reputation effects, portfolio concerns, agency conflicts, and optimal contracting. Yet we maintain that the net positive relation between syndicate

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on 22 individual ratings in three risk sub-categories: political, economic, and financial.

<sup>19</sup> The number 211 is an understatement of the actual number of arrangers because the Loanware database treats merged banks as a single bank rather than two banks, and there have been numerous bank mergers during the 1990s. Unfortunately, if you fail to correct for mergers, the database does not consolidate subsidiaries into bank holding companies either. As a result, Chase New York and Chase Hong Kong appear as separate arrangers.

concentration and sovereign risk is the result of concerns about adverse selection and low-cost re-contracting. This assertion is consistent with not only our findings, but also the findings in related work on syndication in other settings.

## **V. Summary and Conclusions**

This paper examines the relationship between creditor rights, legal enforcement, and syndicate structure in the global market for syndicated project finance loans as a way to improve our understanding of the governance role played by large creditors in general and banks in particular. We find that debt ownership is highly concentrated, and significantly more concentrated than equity ownership in most US industrial firms. While it is true that debt does not have the control rights associated with equity, except in default scenarios, the structure of debt ownership affects monitoring incentives, re-contracting costs, and deterrence effectiveness, three functions traditionally associated with bank debt. Second, we show that debt ownership concentration (syndicate size) is positively (negatively) related to the strength of creditor rights and the reliability of legal enforcement after controlling for loan size, sovereign risk, and project risk. These findings are consistent with the idea that banks monitor and provide low-cost re-contracting when they have strong legal rights and can rely on enforcement mechanisms, but resort to deterrence through costly re-contracting when they possess few legal rights or cannot rely on local enforcement.

We view these results as an initial foray into two, largely unexplored realms of finance—creditor governance and syndicated lending—and believe more research is needed on both fronts. For example, we show that creditor rights and legal enforcement affect the structure of debt ownership, but have not shown that there is a link to either corporate financing policies more generally or to economic growth. What our results do show, however, is that syndicated loans represent an intermediate form of debt financing. Observed debt structures are far more complex than most of the simple financing models admit, and the range between single bank creditors (private debt) and atomistic public bondholders is far more continuous than binary. We hope this paper informs future models of debt choice by clarifying actual debt ownership structures and highlighting some key determinants of syndicate structure. Finally, with regard to the governance role played by banks, we have shown that bankers structure syndicates in ways

that are consistent with attempts to deter strategic default. Whether less concentrated syndicates do, indeed, deter strategic default is an unanswered question. Just as the research on equity ownership and governance by large shareholders has branched out over the past five years, we expect the research on debt ownership to do the same.

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**Table 1**  
 Distribution of Syndicated Loans by Country  
 (Sorted by the dollar value of all Project Finance Loans)

This table shows the geographic distribution of syndicated loans from the Loanware database for the 15 countries with the largest dollar value of project finance loans (it excludes bilateral loans with only one lender). The table includes all project finance tranches and project finance tranches greater than \$75 million with syndicate data (our sample).

No.	Country	Project Finance Loans All Tranches				Project Finance Loans Tranches >\$75 Million with Syndicate Data			
		Value (\$B)	Percent	Number	Percent	Value (\$B)	Percent	Number	Percent
1	United States	\$141.2	16.3%	964	14.8%	\$20.2	13.4%	75	15.2%
2	United Kingdom	110.4	12.8	405	6.2	17.1	11.4	47	9.5
3	Australia	46.1	5.3	268	4.1	10.9	7.2	33	6.7
4	Indonesia	47.6	5.5	330	5.1	8.9	5.9	30	6.1
5	China	37.1	4.3	558	8.6	7.3	4.9	38	5.7
6	Taiwan	24.7	2.9	83	1.3	17.5	11.6	25	5.1
7	Malaysia	26.0	3.0	195	3.0	5.6	3.7	24	4.9
8	Canada	24.5	2.8	148	2.3	2.3	1.5	7	1.4
9	Hong Kong	24.9	2.9	159	2.4	13.9	9.2	38	7.7
10	Thailand	24.9	2.9	204	3.1	5.1	3.4	18	3.6
11	Italy	15.3	1.8	81	1.3	0.8	0.5	5	1.0
12	Saudi Arabia	16.0	1.9	99	1.5	3.6	2.4	8	1.6
13	Turkey	17.9	2.1	240	3.7	1.6	1.1	7	1.4
14	Mexico	15.8	1.8	130	2.0	0.5	0.3	4	0.8
15	Qatar	15.2	1.0	34	0.5	0.6	0.4	2	0.4
<b>Totals:</b>									
<b>Top 15 Countries</b>		<b>\$587.6</b>	<b>68.0%</b>	<b>3,898</b>	<b>59.9%</b>	<b>\$115.9</b>	<b>77.0%</b>	<b>361</b>	<b>72.9%</b>
<b>Full Database</b>		<b>\$864.3</b>		<b>6,505</b>		<b>\$150.5</b>		<b>495</b>	

Source: Capital DATA Loanware



**Table 2**  
Univariate Analysis of Syndicate Structure

This table provides a univariate description of the main variables used in the study. The variables are broken into four groups: project variables (Panel A), legal variables (Panel B), syndicate structure variables (Panel C), and loan pricing variables (Panel D). The table shows the number of loan tranches with data available, and the mean, median, and standard deviation for each variable.

Variable	Project Finance Loan Tranches >\$75m				Project Finance Loan Tranches >\$500m			
	Number	Mean	Median	Std. Dev.	Number	Mean	Median	Std. Dev.
<b>Panel A: Project and Loan Variables</b>								
Project Size (\$ millions)	113	820.0	586.0	1302.1	20	1927.9	1304.7	2683.8
Tranche Size (\$ millions)	495	304.0	180.0	540.9	74	948.2	702.3	1194.3
Leverage: Debt/Total Project Size (%)	45	69.4%	70.7%	13.7%	9	65.6%	68.0%	13.4%
Tranche/Total Debt (%)	45	66.3%	67.6%	28.2%	9	60.5%	59.5%	34.9%
Tranche/Total Project Size (%)	113	47.8%	43.8%	26.2%	20	42.5%	43.6%	23.2%
Maturity (Years)	474	9.4	9.0	4.8	74	10.2	10.0	5.6
Instit. Investor Rating [0-100 low risk]	493	68.5	68.5	18.2	74	70.4	72.5	16.7
<b>Panel B: Legal Risk Variables</b>								
LLSV (1998) Creditor Rights [0-4 strong]	406	2.4	2.0	1.4	57	2.5	3.0	1.5
LLSV (1998) Shareholder Rights [0-6 strong]	408	3.8	4.0	1.3	57	4.1	4.1	1.2
BPR (1999) Legality Index	408	17.5	19.1	4.0	57	18.5	20.4	3.6
<b>Panel C: Syndicate Structure Variables</b>								
<b>Concentration Ratios</b>								
Herfindahl-Hirschman Index (HHI)	495	14.9%	10.25%	13.5%	74	5.7%	4.9%	3.4%
Largest Single Share (CR1)	495	20.3%	14.8%	16.2%	74	9.6%	8.0%	5.3%
Top Five Shares (CR5)	495	61.2%	57.3%	25.6%	74	36.7%	33.4%	15.6%
<b>Arranging Banks</b>								
Total Arranger Share (%)	495	39.2%	33.0%	28.5%	74	34.2%	30.2%	25.9%
Number of Arrangers	495	3.6	2.0	3.9	74	5.8	4.0	5.8
Average Arranger Share (%)	490	16.7%	11.4%	16.1%	73	7.0%	5.9%	5.0%
<b>Providing (Non-arranging) Banks</b>								
Total Non-Arranger Provider Share	495	60.8%	67.0%	28.5%	74	65.8%	69.8%	11.6%
Number of Non-Arranger Providers	495	11.0	9.0	9.3	74	22.2	21.0	11.6
Average Non-Arranger Provider	457	9.3%	6.5%	9.9%	73	3.6%	3.1%	2.5%
<b>Total Number of Banks</b>	495	14.4	12.0	10.3	74	28.0	25.5	11.7
<b>Syndicate Shape (Providers/Arrangers)</b>	490	5.7	3.5	6.5	73	8.4	5.2	9.4
<b>Panel D: Loan Pricing Variables</b>								
<b>Fees (bp)</b>								
Commitment	262	31.9	30.0	20.3	47	29.1	25.0	15.1
Undrawn Return	349	30.4	28.4	23.5	65	28.5	28.6	19.8
<b>Spreads (bp)</b>								
Loan Spread	404	122.8	102.5	79.1	68	105.0	95.0	53.1
Drawn Return	287	132.2	122.2	77.9	46	112.3	100.8	60.3

Source: Capital DATA Loanware.

**Table 3**  
Determinants of Syndicate Structure—Concentration and Share Measures

This table shows the results of Tobit regressions on syndicate structure variables. The dependent variables are various debt ownership concentration measures: Herfindahl Index, largest single bank share, share of the five largest banks, arranging banks, total and average share for arranging banks, and average share for providing banks.

	Concentration and Share Measures					
	Herfindahl Index	Largest Single Share	Top 5 Banks Share	Total Arranger Share	Average Arranger Share	Average Provider Share
	Reg. #1	Reg. #2	Reg. #3	Reg. #4	Reg. #5	Reg. #6
Constant	<b>0.100 *</b> (2.04)	<b>0.143*</b> (2.33)	<b>0.495 **</b> (4.28)	<b>0.783 **</b> (5.18)	0.108 (1.59)	0.038 (1.20)
Weak Creditor Rights (Civil Law) Dummy Variable	<b>-0.043 **</b> (-2.63)	<b>-0.037 *</b> (-1.79)	<b>-0.113 **</b> (-2.90)	<b>-0.175 **</b> (-3.43)	<b>-0.057 *</b> (-2.49)	-0.017 (-1.63)
LLSV Shareholder Rights	<b>-0.012 *</b> (-1.70)	<b>-0.016 *</b> (-1.86)	<b>-0.038 *</b> (-2.33)	-0.017 (-0.83)	<b>-0.025 **</b> (-2.70)	<b>-0.009 *</b> (-2.13)
BPR Legality Index	<b>0.008 **</b> (2.70)	<b>0.011 **</b> (2.75)	<b>0.032 **</b> (4.27)	0.008 (-0.88)	<b>0.013 **</b> (2.93)	<b>0.009 **</b> (4.67)
Loan Pricing Residual	0.0001 (1.12)	0.0001 (0.90)	0.0003 (1.55)	0.0002 (0.83)	0.0001 (1.08)	9.9e-06 (0.22)
Multi-/Bi-lateral Agency Dummy Variable	<b>0.054 *</b> (1.86)	<b>0.063 *</b> (1.74)	0.072 (1.05)	0.079 (0.89)	<b>0.106 **</b> (2.65)	-0.006 (-0.34)
Inverse of Tranche Size (\$m)	<b>13.404 **</b> (8.42)	<b>15.898 **</b> (7.96)	<b>39.654 **</b> (10.41)	6.783 (1.39)	<b>14.597 **</b> (6.65)	8.847 (8.08)
Institutional Investor Rating	<b>-0.002 **</b> (-2.80)	<b>-0.003 **</b> (-2.77)	<b>-0.008 **</b> (-4.32)	-0.002 (-0.97)	<b>-0.002 *</b> (-2.10)	<b>-0.002 **</b> (-4.91)
Maturity (Years)	0.002 (1.40)	0.002 (1.01)	<b>0.008 **</b> (2.62)	0.002 (-0.49)	0.002 (1.16)	0.003 (3.18)
Refinanced Loan Dummy Variable	-0.013 (-0.70)	-0.018 (-0.82)	-0.014 (-0.33)	-0.007 (-0.14)	-0.001 (-0.06)	0.005 (0.45)
Guaranteed Loan Dummy Variable	0.003 (0.19)	0.001 (0.06)	0.013 (0.41)	-0.012 (-0.29)	-0.015 (-0.83)	0.004 (0.53)
Secured Loan Dummy Variable	0.005 (0.50)	0.014 (0.99)	-0.005 (-0.21)	0.047 (1.41)	0.016 (1.09)	-0.003 (-0.39)
JP Morgan Emerging Market Bond Spread (bps)	6.0e-06 (0.34)	22.0e-06 (0.98)	12.7e-06 (0.30)	84.6e-06 (1.53)	16.9e-06 (0.68)	-5.9e-06 (-0.50)
US Dummy Variable	<b>0.038 *</b> (2.17)	<b>0.059 **</b> (2.69)	<b>0.154 **</b> (3.74)	-0.032 (-0.59)	0.032 (1.35)	<b>0.049 **</b> (4.27)
Sector Dummy Variables	Included *	Included *	Included *	Included *	Included *	Included *
Number of Observations	304	304	304	304	303	290
Likelihood Ratio	101.85	99.53	152.27	43.61	77.39	114.36
Prob. > Chi-Square	0.000	0.000	0.000	0.001	0.000	0.000

Note: \* and \*\* denote significance at the 10% and 1% level in a one-tailed test, respectively. NM denotes not meaningful.

**Table 4**  
Determinants of Syndicate Structure—Syndicate Size

This table shows the results of Tobit regressions on the number of banks included in the syndicate. The dependent variables are the number of total banks, arranging banks, and providing banks.

	<b>Syndicate Size (Number of Banks)</b>		
	<b>Total Banks</b>	<b>Arranging Banks</b>	<b>Providing Banks</b>
	Reg. #1	Reg. #2	Reg. #3
Constant	<b>29.911 **</b> (6.71)	<b>19.182 **</b> (4.89)	<b>14.883 **</b> (3.50)
Weak Creditor Rights (Civil Law) Dummy Variable	<b>3.215 *</b> (2.15)	<b>-2.510 *</b> (-1.90)	<b>4.805 **</b> (3.36)
LLSV Shareholder Rights	0.907 (1.46)	0.710 (1.18)	<b>1.016 *</b> (1.72)
BPR Legality Index	<b>-0.984 **</b> (-3.47)	<b>-0.760 **</b> (-3.01)	<b>-0.709 **</b> (-2.66)
Loan Pricing Residual	<b>-0.013 *</b> (-2.09)	-0.004 (-0.63)	<b>-0.010 *</b> (-1.67)
Multi-/Bi-lateral Agency Dummy Variable	<b>-5.777 *</b> (-2.19)	<b>-10.481 **</b> (-3.48)	-1.875 (-0.74)
Inverse of Tranche Size (\$m)	<b>-1715.943 **</b> (-11.84)	<b>-686.028 **</b> (-4.98)	<b>-1394.872 *</b> (-10.09)
Institutional Investor Rating	<b>0.169 *</b> (2.51)	-0.033 (-0.57)	<b>0.200 **</b> (3.11)
Maturity (Years)	<b>-0.306 **</b> (-2.77)	-0.135 (-1.35)	<b>-0.234 *</b> (-2.23)
Refinanced Loan Dummy Variable	1.444 (0.90)	-0.468 (-0.31)	1.492 (0.98)
Guaranteed Loan Dummy Variable	0.609 (0.51)	-0.332 (-0.31)	0.905 (0.79)
Secured Loan Dummy Variable	0.101 (0.10)	0.647 (0.73)	0.235 (0.25)
JP Morgan Emerging Market Bond Spread (bps)	-0.001 (-0.86)	0.002 (1.32)	-0.001 (-0.93)
US Dummy Variable	<b>-2.797 *</b> (-1.77)	-0.658 (-0.45)	<b>-2.708 *</b> (-1.80)
Sector Dummy Variables	Included *	Included	Included *
Number of Observations	304	304	304
Likelihood Ratio	159.87	77.21	130.91
Prob. > Chi-Squared	0.000	0.000	0.000

Note: \* and \*\* denote significance at the 10% and 1% level in a one-tailed test, respectively.  
NM denotes not meaningful.