Financial Management

Why Larger Lenders Obtain Higher Returns: Evidence from Sovereign Syndicated Loans

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Lenders who make large funding commitments earn higher rates of return than those who make smaller commitments. We analyze a data set of sovereign syndicated loan contracts to document study and this phenomenon. We show that the "large lenders" in the lending syndicates earn a "return premium," which is positively affected by the likelihood of future liquidity problems of the borrower. This finding suggests that the onus would be on the large lenders in particular to provide services, such as liquidity insurance and coordinating the workout. The return premium also increases in the fraction of banks among the larger syndicate members, suggesting that banks are special lenders in terms of addressing idiosyncratic liquidity problems.

Lenders who make large funding commitments earn higher rates of return than those who make smaller commitments. In this paper, we use a syndicated loans data set to document and analyze this striking feature of loan pricing. The data reveal that while all syndicate members receive the same interest spreads, their so-called *all-in margins* tend to increase in the committed amounts. The all-in margin incorporates the interest spread as well as the upfront fees lenders may receive, where the upfront fee is amortized over the average lifetime of the loan.[1] Upfront fees, and hence all-in margins, typically increase in discrete steps in the committed amounts. For example, the upfront fee may be 20 basis points for lenders that commit between $5 and $10 million, 30 basis points for lenders in the $10-20 million bracket, and 40 basis points for lenders in the $20 million plus bracket. In our data set of 288 syndicated loans issued by or guaranteed by sovereign entities in developing countries in 1982-2006, the lenders in the highest bracket are promised an all-in margin, which is 8.5% higher than the all-in margin of the lenders in the lowest bracket. Assuming that all syndicate members can attract their funds at the benchmark interest

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[1]The all-in margin incorporates annual fees to banks as well and typically also contains the amortized underwriting fee. However, in our paper, we expressly exclude the underwriting fee when computing the all-in margin as it is associated with a service (insuring funding availability). We focus on compensation for funding commitments only.

rate on the loans (almost always the six-month Libor in our data set), the return net of funding cost is therefore 8.5% higher for "large lenders" than for "small lenders."

While risk aversion can perhaps explain why lenders would demand a higher return for greater funding commitments, we address the puzzle of why borrowers are prepared to pay larger lenders more, and thus seem to pay more than would be necessary if there were only small lenders. For instance, in a syndicated loan context, borrowers could work with larger syndicates of lenders who each make small commitments. The main hypothesis we explore, the *Borrower Liquidity Hypothesis*, states that the phenomenon of higher returns for larger lenders can be attributed to their disproportionately greater role than small lenders when addressing future liquidity problems of the borrower. Such borrower illiquidity results in costly loan renegotiations involving time commitments, creditor coordination, and potentially new funding injections.[2] For example, in a syndicated lending context, the large syndicate members may carry a disproportionately large share of these potential costs, which is why their all-in margin is higher.

The Borrower Liquidity Hypothesis ties in with the literature regarding relationship lending. Elsas and Krahnen (1998), Boot (2000), and others demonstrate that relationship lenders monitor borrowers and act as liquidity insurers in situations of liquidity problems of the borrower. Elsas (2005) confirms that the key factor in explaining whether a lender views itself as a borrower's relationship lender is the relative size of that lender's share of the borrower's debt. Large lenders may play a similar role in syndicated lending and this is indeed suggested by Dennis and Mullineaux (2000), Lee and Mullineaux (2004), and Sufi (2007). Yet, so far this evidence of large lender activism in the case of idiosyncratic liquidity problems has not been linked to the pricing of loan contracts, which is the main contribution of this paper.

In line with the Borrower Liquidity Hypothesis, we find that standard proxies for the likelihood of borrower illiquidity are associated with higher values of what we call the *return premium* i.e., the difference between the maximum and the minimum all-in margin received by the lenders in the syndicate, expressed as a fraction of the minimum all-in margin. We also find that the return premium is positively affected by factors that are known to aggravate the coordination problems of lenders in case of loan renegotiations. These factors are the number of lenders and the presence of information issues between the lenders and the borrower. In contrast, factors that are traditionally associated with insolvency problems of the borrower are not associated with higher values of the return premium.

Taken together, our findings strongly support the Borrower Liquidity Hypothesis that large lenders obtain higher returns because they carry a disproportionately large share of the cost associated with potential workouts, which involve coordinating lenders, renegotiating the loan, and providing liquidity insurance. These findings complement those of Gatev and Strahan (2009) who determine that anticipated liquidity insurance needs affect the structure of lending syndicates. In Gatev and Strahan (2009), the need for liquidity insurance is associated with liquidity shocks in the commercial paper *market*, which affect multiple borrowers simultaneously. Our findings indicate that *idiosyncratic* liquidity shocks result in return differences across lenders. Do idiosyncratic liquidity shocks also affect the structure of lending syndicates? We try to address this question through two complementary hypotheses.

The *Syndicate Structure Hypothesis* states that borrowers offer a higher rate of return for greater funding commitments with the objective of reducing the number of lenders that join the syndicate.

[2] In a sovereign lending context, borrowers are said to be illiquid if they attempt to renegotiate the terms of the loan rather than to repudiate the contract outright (which is termed insolvency). This is different in principle from borrower illiquidity in a corporate lending context where the cash balance of the borrower is insufficient to fulfill current debt obligations, while the borrower may still have positive equity value and thus be solvent.

This hypothesis rests on the logic that borrowers and lenders that appreciate the possibility of future liquidity problems will structure the loan contract so as to minimize the expected damage of disorderly workouts. Bergman and Callen (1991) demonstrate that the incentive of lenders, small lenders in particular, to free-ride causes inefficiencies in debt renegotiations. The evidence presented by Ongena and Smith (2000), Esty and Megginson (2003), and Brunner and Krahnen (2008) demonstrates that coordination costs in workouts depend upon the number of lending relationships (as well as on institutional factors such as bankruptcy legislation or "bank pools" in Germany). Hao and Roberts (2007) confirm that the number of lenders affects the interest spreads on syndicated loans. However, none of these papers discuss the mechanism that is used to control the number of lenders. In the context of syndicated lending, the return premium may serve this purpose. Higher return premiums may invite greater average funding commitments thereby reducing the number of lenders that join the syndicate during the general syndication stage.[3] However, our results do not support the Syndicate Structure Hypothesis, or the closely related hypothesis that the return premium reduces the "concentration ratio" of the syndicate. The major determinants of the number of joining lenders are the size of the loan and credit market liquidity.

Our third and final hypothesis is that banks (depository institutions) are better at managing borrower illiquidity than nonbank lenders. Banks could be special because their dependence on deposit financing make them superior monitors (Coleman, Esho, and Sharpe, 2006), superior at providing liquidity insurance (Gatev and Strahan, 2006; Gatev and Strahan, 2009), or because repeated lending has rendered banks special skills that are useful in workouts. We find evidence consistent with the *Banks Are Special Hypothesis*. Specifically, we show that the return premium is positively affected by the fraction of banks among the lenders in the higher ranks (that obtain the highest returns), while the return premium is not significantly affected by the fraction of banks in the entire syndicate or the fraction of banks in the lower ranks of the syndicate. Our evidence in support of the Banks Are Special Hypothesis is consistent with the recent study of the US credit market of Huang and Ramírez (2010), who conclude that banks gravitate toward segments of the credit market where monitoring, renegotiation, and liquidation are important. They show, for example, that in the so-called Rule-144A credit market, both banks and qualified institutional investors have advantages over public lenders at screening borrowers with high credit risk and information asymmetry. However, banks tend to adopt a buy-and-hold strategy, whereas qualified institutional investors are transient investors that pick up Rule-144A issues that are subsequently registered for public trading.

Hallak (2009) is the only other paper that reveals that the pricing of loans is affected by the likelihood of borrower liquidity problems. Using a sovereign loans data set, he confirms that anticipated borrower liquidity problems have a positive effect on the upfront fee the lender(s) charge but do not impact the interest spread. Our paper is the first to address the different question of why large lenders earn more than small ones. There is a degree of overlap between our data set and that of Hallak (2009); however, Hallak's (2009) or other existing loans data sets would not be appropriate to address the question of this paper. The heart of the problem of existing syndicated loans databases is that information regarding the compensation of the individual syndicate members is typically either missing or unreliable. Indeed, to put together our data set, we verified and completed each observation from a standard loans database by consulting a

[3]In the general syndication stage (also known as the public syndication stage or postmandate stage), the mandated arrangers (i.e., the syndicate members that have been mandated by the borrower to form the syndicate) actively search for additional syndicate members to bring together the envisaged amount. Therefore, typical loan syndicates consist of the mandated arrangers plus the lenders that join the syndicate during the general syndication stage.

variety of other sources (see Section I). This procedure has come at the expense of a reduction in the sample size to 288 loans.

Our paper relates to two strands of research on syndicated lending. First, there is a sizable body of research about the pricing of syndicated loans. Interest spreads are found to depend on borrower characteristics (Eichengreen and Mody, 2000; Gupta, Singh, and Zebedee, 2008), the financial market environment (Ciarlone, Piselli, and Trebeschi, 2009), and information asymmetries between borrower and the lenders (Wittenberg-Moerman, 2008; Ivashina, 2009). The works of Esty and Megginson (2003), Coleman et al. (2006), Harjoto, Mullineaux, and Yi (2006), and Hao and Roberts (2007) demonstrate that loan spreads may also depend on the type of lead lender and syndicate size (i.e., the syndicate structure more generally). This paper underscores the importance of accounting for the differences in compensation between lenders in the same syndicate. Second, Dennis and Mullineaux (2000), Esty and Megginson (2003), Lee and Mullineaux (2004), Sufi (2007), Gatev and Strahan (2009), Panyagometh and Roberts (2010), and others assess which characteristics of the borrowers and the financial market environment affect the syndication decision and the structure of the lending syndicate. In our paper, we detect a link between the return premium and the fraction of banks among the large lenders in the syndicate. Although we do not provide a direct test, this finding suggests there is also a connection between idiosyncratic borrower liquidity risk and syndicate structure.

Our data set comprises loans for which borrower liquidity problems may tend to be substantial. First, syndicated loans involve, by definition, multiple lenders, introducing potential coordination problems between lenders like hold-outs in workouts.[4] Our data set also consists of sovereign loans, which implies that defaults and workouts are not governed by structures akin to bankruptcy codes in a corporate debt context. Sovereign loan defaults are complicated further by sovereign immunity resulting in the inability of creditors to collateralize the assets of sovereign debtors.[5] Finally, our focus on borrowers residing in developing countries may matter. An assessment of the importance of idiosyncratic liquidity problems on lender compensation in the context of corporate debt markets is deferred to future research.

The rest of the paper is organized as follows. In the next section, we describe our data set of sovereign syndicated loans and document the characteristics of the fees received by lenders. Section II provides a detailed account of the hypotheses we test and the empirical strategy. Section III presents the main results and Section IV explores several robustness tests. The final section concludes.

I. The Data and the Return Premium of Large Lenders

Our main data source for the syndicated loan contracts is Thomson One Banker. We selected all foreign-currency-denominated syndicated loans issued or guaranteed by sovereign borrowers from developing countries from November 1982 to December 2006.[6] The beginning of this time

[4] As in the Bolton and Scharfstein (1996) argument. See also Morris and Shin (2004) for the context of sovereign debt markets. Preece and Mullineaux (1996), Bolton and Freixas (2000), and Brunner and Krahnen (2008) demonstrate the importance of coordination costs between lenders.

[5] Sovereign borrowers in default are subject to at least two risks, namely, the loss of access to international capital markets and international trade disruption, which is impeded if lenders no longer grant letters of credit (Eaton and Gersovitz, 1981; Cole, Dow, and English, 1995; Grossman and Han, 1999; Rose, 2005). Bulow and Rogoff (1989) challenged the reality of sovereign immunity and also claimed that sovereign debt is not sustainable unless creditors have the right to seize the debtor's cash and assets available abroad. See Eaton and Fernandez (1995) for a survey.

[6] The World Bank defines developing countries as countries in which 2006 gross national income per capita is less than $11,116.

period is marked by the starting date of Thomson One Banker. Sovereign borrowers are central governments, ministries, or central banks. In the case of borrowers guaranteed by sovereigns, the beneficiaries are usually local authorities or state-owned firms such as utility firms, grain boards, and import-export banks. Almost all of the loans are in US dollars.

In the sample period, sovereign entities from developing countries issued or guaranteed 1,697 loans, 1,454 of which were reported as completed. Of these 1,454 completed loans, 1,230 were "publicly syndicated loans" and we kept the 1,228 variable interest rate loans only. We removed all loans with insufficient information regarding variables we use in our analysis, namely, interest spread, loan amount, lifetime, upfront fees, and the identity of the lenders in the syndicate. In this last step, we lost many observations.

Unfortunately, Thomson One Banker, as well as other databases such as LPC's DealScan or Euromoney's Loanware, suffers from lack of accuracy when it comes to documenting the composition of the syndicate and the upfront fee schedule in most contracts. For instance, frequently only the highest or the lowest upfront fee is reported and errors have been made in labeling the many reported fees. Therefore, we manually checked each observation that was left over using various issues of the *International Financing Review* (i.e., the most important magazine on syndicated lending for practitioners) as well as several news databanks such as Dow Jones' Factiva and LexisNexis. In the process of our verification, we managed to extract the necessary information for a few additional loan contracts that were not reported in Thompson One Banker. However, our screening job also led to the loss of quite a few nonrepresentative observations, such as those that were part of bigger renegotiation packages (e.g., Brazilian loans issued in the 1980s). We also screened out loans that were not publicly syndicated (so-called "club loans") and those we found to be "sponsored" or partially guaranteed by firms rather than sovereigns from developed countries.

Another important reason for checking the observations contract by contract was to determine exactly when the lenders had joined the syndicate. Typically, loan syndications proceed in two stages (Rhodes, 2004). During the premandate stage, the borrower searches for an arranger or a set of arrangers and agrees on a draft lending agreement or mandate. In the postmandate stage or general syndication stage, the mandated arrangers actively search for additional syndicate members. The general syndication stage ends when the borrower and all lenders in the completed syndicate sign the loan contract.[7] The upfront fees schedule is announced by the arranger(s) at the beginning of the general syndication stage and lenders that join the syndicate during this stage receive their upfront fee without a formal obligation to offer any services ex post. As our study focuses on the relationship between committed funding amount and promised return, it is crucial to know whether lenders joined the syndicate in the premandate phase or during the general syndication stage. While the timing is usually clear from the titles awarded to the lenders (e.g., managers, comanagers, and participants always join the syndicate during general syndication), titles do not give away everything. We found that the coarrangers in our data set commonly joined the syndicate in the general syndication stage, but occasionally entered during the premandate phase.

Our data set eventually includes 288 loans issued by sovereign borrowers from 32 developing countries. There are 248 term loans, 20 revolving credits, and 2 project finance loans. Additionally, there are eight other credit instruments representing 18 loans that have "trade purposes" as the primary use of funds. Table I describes the distribution of loans over time. We observe that volume

[7]What has been described is an outline of a typical process prior to the signing of a syndicated loan agreement. Sometimes enough syndicate members are found by the end of the premandate stage so that a contract can be signed immediately. These loans are called "club loans." It also happens that there are two general syndication stages.

Table I. Distribution of the Number of Loans Over Time

The "Final Sample" is the sample of 288 loans used in our estimations. The "Full Sample" is the sample of all 1,228 sovereign, variable-rate, publicly syndicated loans in Thompson One Banker.

Year	Final Sample		Full Sample		Final Sample
	Number of Observations	Percentage of Sample Size	Number of Observations	Percentage of Sample Size	Percentage of Full Sample
1982	1	0.35	13	1.06	7.7
1983	24	8.33	117	9.53	20.5
1984	23	7.99	99	8.06	23.2
1985	21	7.29	78	6.35	26.9
1986	21	7.29	60	4.89	35.0
1987	21	7.29	73	5.94	28.8
1988	16	5.56	55	4.48	29.1
1989	13	4.51	28	2.28	46.4
1990	11	3.82	32	2.61	34.4
1991	5	1.74	54	4.40	9.3
1992	11	3.82	64	5.21	17.2
1993	7	2.43	63	5.13	11.1
1994	7	2.43	36	2.93	19.4
1995	11	3.82	47	3.83	23.4
1996	15	5.21	49	3.99	30.6
1997	16	5.56	68	5.54	23.5
1998	17	5.9	51	4.15	33.3
1999	7	2.43	52	4.23	13.5
2000	6	2.08	44	3.58	13.6
2001	8	2.78	26	2.12	30.8
2002	14	4.86	43	3.50	32.6
2003	4	1.39	30	2.44	13.3
2004	6	2.08	20	1.63	30.0
2005	1	0.35	12	0.98	8.3
2006	2	0.69	14	1.14	14.3
Total	288	100	1,228	100	23.5

in the sovereign syndicated loan market was relatively high in the first half of the 1980s. Volume in the sovereign syndicated debt market was at a more or less stable level from 1986 to 2003, while it appears lower during 2004 to 2006.

Table II provides several descriptive statistics of the contracts in the final sample. In Table II, we see that the average loan amount is $181.3 million 1995 dollars (about $260 million in 2008 dollars). The average loan amount is comparable to the $150 million found in Hallak (2009). Additionally, the lifetime of the loan and the average lifetime (essentially the duration of the principal when the loan is granted) are 5.7 and 4.3 years, respectively, with quite a bit of variation across loans. The average lifetimes in Eichengreen and Mody (2000) (5.3 years) and Hale (2007) (4.9 years) are similar. Furthermore, the average syndicate is larger than the average of 14.4 in the sample of international project finance loans in Esty and Megginson (2003). The total number of syndicate members is 23.4, on average. Additional investigation indicated that the syndicate size declines to approximately 18.4 lenders during the 1990s and 2000s (not reported in Table II). Finally, on average 19.6 lenders join during the general syndication stage.

Table II. Descriptive Statistics of the Final Sample

Variable definitions are reported in Tables IV and V.

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Loan Size (millions of 1995 USD)	288	181.1	167.1	7.16	1118
Lifetime (years)	288	5.7	3.6	0.25	17.5
Average Lifetime (years)	288	4.3	2.5	0.25	12.0
Number of Joining Lenders	288	19.1	14.1	2	76
Total Number of Lenders	288	23.4	15.5	4	78
Number of Large Lenders[a]	288	10.9	8.0	1	61
Fraction of Banks[b] *as Large Lenders*	288	0.95	0.10	0	1
Number of Small Lenders[c]	288	12.5	11.8	0	54
Fraction of Banks as Small Lenders	258	0.91	0.11	0	1
Interest Spread (basis points)	288	93.4	81.7	3.13	450
Minimum Upfront Fee (bps)	288	32.0	30.5	3.125	225
Maximum Upfront Fee (bps)	288	52.0	37.3	10	275
Minimum All-In Margin (bps)	288	107.8	91.5	4.5	480
Maximum All-In Margin (bps)	288	115.8	97.1	6.5	500
Return Premium (%)	288	8.52	7.81	0.86	45.84

Notes: a, b, and c, are clarified in Table III

Next, let us turn to the composition of the syndicates. In this context, we define "large lenders" as lenders in one of the following ranks: 1) colead manager, 2) lead manager, 3) senior lead manager, 4) senior manager, 5) senior colead manager, 6) coordinating arranger, 7) coordinator, 8) agent, 9) coagent, 10) arranger, or 11) coarranger.[8] We found that in our data set, the lenders that receive the highest compensation are always found in these ranks. "Small lenders" are the syndicate members that were not classified as large, namely: 1) participants, 2) comanagers, and 3) managers. Table II shows that there are on average slightly more small lenders on syndicates than large lenders. The *Fraction of Banks as Large Lenders*, represents the fraction of banks among the large lenders in the syndicate, and the *Fraction of Banks as Small Lenders* the fraction of banks among the small lenders. Here, we earmarked lenders as "banks" if they are essentially depository institutions. However, the details are a bit involved as Thomson One Banker does not report lender type (see Table III, footnote c). Tables II and III make clear that banks generally constitute a large percentage of the syndicate members, both across ranks and loans types. The percentages are high because there are 1,202 banks among the total 1,367 lenders that are involved at least once in any of the 288 syndicated lending arrangements. Note that the average *Fraction of Banks as Large Lenders* is slightly higher than the *Fraction of Banks as Small Lenders*.

Finally, let us address the compensation of lenders. For the vast majority of observations, the interest spread represents the spread over the six-month USD Libor. The minimum and maximum upfront fees (received by the smallest and largest lenders that join the syndicate during the general syndication stage) are, on average, 32 and 52 basis points, respectively. The 52 basis point figure for the average maximum upfront fee is lower than the 74.3 basis points

[8]Hao and Roberts (2007) and Gatev and Strahan (2009) look at a broader set of ranks among the active lenders in their studies, namely, comanager or higher. However, in our data set the ranks of comanager and manager are usually the lowest available ranks, which receive the lowest compensation among the syndicate members.

Table III. More Descriptive Statistics of the Final Sample

	All Loans	Revolving Credits	Term Loans[a]	Trade Type Loans[b]
Fraction of banks,[c] all lenders	93.2%	94.1%	93.1%	92.4%
Fraction of banks as large lenders[d] (*Colead managers to arrangers*)	94.7%	96.7%	94.5%	94.9%
Fraction of banks as small lenders[e] (*Participants to managers*)	91.2%	93.8%	91.0%	91.6%

[a]Includes two Project Finance loans.
[b]Primary use is for trade purposes. In our sample, this applies to 18 loans: one "Acceptance Credit Facility," four "Bankers Acceptance," one "Buyer Credit," eight "Export Credit," one "Letter of Credit," one "Note Issuance," one "PreExport Finance," and one "Trade Facility."
[c]The classification of lenders into banks and nonbanks has been based on LPC DealScan, Bureau van Dijk's Bankscope, and Dow Jones Factiva. Specifically, we proceeded as follows to classify 1,367 lenders that are involved at least once in any of the 288 syndicated lending arrangements in our data set.

Step 1. If the lender was found in Dealscan, we defined it to be a bank if it is one of the following DealScan types: "African Bank," "Asia-Pacific Bank," "East Europe/Russian Bank," "Foreign Bank," "Middle Eastern Bank," "Thrift / S&L," "US Bank," "Western European Bank." All other lenders, notably "Corporation," "Finance Company," "Insurance Company," and "Investment Bank" were deemed "nonbanks." In this first step, we were able to classify about 90% of our 1,367 lenders into either banks or non-banks.
Step 2. We used Bankscope to search for lenders that did not feature in DealScan. We defined the following BankScope lender types to be banks: "Commercial Bank," "Cooperative Bank," "Medium & Long Term Credit Bank," "Real Estate/Mortgage Bank," "Savings Bank," and "Specialized Governmental Credit Institutions" (in this case only German Landesbanken) and the following types as nonbanks: "Investment Bank/Securities House," "Non-banking Credit Institution." Lenders of type "Bank Holding & Holding Company" as well as the few lenders for which there was no information in either DealScan or BankScope were classified in Step 3.
Step 3. In Step 3, we classified the last few remaining lenders as banks or non-banks using Factiva. We classified the lender as a bank if and only if Factiva showed the lender was a depository institution.

[d]Large lenders are defined as syndicate members in the ranks "colead manager," "lead manager," "senior lead manager," "senior manager," "senior colead manager," "coordinating arranger," "coordinator," "agent," "coagent," "arranger," or "coarranger." Based on the 288 loans in the final sample.
[e]Small lenders are defined as syndicate members in the ranks "participants," "comanagers," or "managers." Based on 258 loans (30 loans had no participants, comanagers, or managers).

reported in Hallak (2009), but his data set includes publicly owned firms in addition to sovereign borrowers.

Upfront fees have a quite notable impact on the all-in margins obtained by lenders. To compute the minimum and maximum all-in margin, the minimum and maximum upfront fees have been amortized over the average lifetime of the loan and the result is added to the interest spread. We computed that the lowest and highest annualized upfront fees constitute, on average, 13.4% and 20.9% of the minimum and maximum all-in margin, respectively.

Finally, we define *return premium* as the difference between the maximum and minimum all-in margins expressed as a fraction of the minimum all-in margin for each facility

$$\textit{Return premium} = \left(\frac{\textit{all-in margin}_{\text{high}} - \textit{all-in margin}_{\text{low}}}{\textit{all-in margin}_{\text{low}}} \right). \tag{1}$$

The average return premium is 8.52%. This means that the largest lender in the syndicate receives 8.52% more than the smallest lenders annually. The return premium varies substantially across observations. The lowest return premium is 0.86% while the highest is 45.84%.

II. The Empirical Strategy

A. Hypotheses

As explained in the introduction, there are good theoretical and empirical reasons to hypothesize that syndicate members that provide large funding shares carry disproportionately larger shares of the burden should the borrower ever enter into liquidity problems and renegotiate the loan. The costs of large lenders would arise from monitoring, coordinating lenders, and providing liquidity insurance. The main hypothesis of this paper is:

H1 (*Borrower Liquidity Hypothesis*): The return premium compensates lenders that commit large amounts for a set of services they are expected to perform in case of borrower liquidity problems (illiquidity) (e.g., monitoring the borrower, renegotiating the loan, coordinating the lenders, and providing liquidity insurance in case of a workout).

A straightforward empirical implication of the Borrower Liquidity Hypothesis is that the return premium increases in the likelihood of liquidity shortages as perceived at the time the loan contract is written. A second prediction based on the Borrower Liquidity Hypothesis is that the anticipated number of lenders that join the syndicate positively affects the return premium. This prediction is based on several studies (reviewed in the introduction) that demonstrate that the number of lenders positively affects their coordination cost during loan renegotiations.[9] Finally, information problems surrounding the borrower (e.g., costs to overcome information asymmetries between the borrower and the lenders) may also increase the coordination costs between lenders (Brunner and Krahnen, 2008). Thus, proxies for information problems may also be associated with increased return premiums.

Our second hypothesis is inspired by the observation that borrowers and lenders that recognize the possibility of future liquidity problems may structure the loan contract so as to minimize the expected damage of disorderly workouts. The return premium may possibly play a role in this context. Borrowers that wish to reduce the number of lenders in the syndicate may do so by inviting greater commitments by increasing the return premium thus attracting larger commitments. If this were the case, the return premium and the number of lenders would tend to move in opposite directions when controlling for loan size and other factors. This possible role for the return premium to control the structure of the lending syndicate is obviously related to the Borrower Liquidity Hypothesis. However, note that the Borrower Liquidity Hypothesis does not imply the Syndicate Structure Hypothesis because arrangers may employ different instruments to control syndicate size.[10]

H2 (*Syndicate Structure Hypothesis*): The return premium is aimed at targeting the number of lenders that join the syndicate. Higher values of the return premium tend to reduce the number of lenders that join the syndicate.

Our final hypothesis ties in with recent literature regarding banks as liquidity providers. Gatev and Strahan (2006) indicate that the funding position of banks improves in case of adverse liquidity shocks in the commercial paper market. Thus, investors that pull out of commercial paper do not tend to exit the financial system altogether but deposit these funds (or at least part of them) with

[9]However, Schure, Scoones, and Gu (2005) argue that syndication may align the risk structure of the loan portfolios of lenders, and hence also their incentives if borrowers default.

[10]We are not aware of any research that touches upon the mechanism through which the size of the syndicate is controlled.

banks. Gatev and Strahan (2006) attribute this result to deposit insurance and "too-big-to-fail," making banks safe havens in times of liquidity shocks.

The finding of Gatev and Strahan (2006) implies that banks have a competitive edge over nonbank lenders in providing liquidity insurance (e.g., finance companies, investment banks), particularly for borrowers that also tap the commercial paper market. Gatev and Strahan (2009) demonstrate that the structure of lending syndicates is consistent with the prediction in Gatev and Strahan (2006). Specifically, they find that the fraction of banks in the syndicate is significantly higher: 1) if the loan is a line of credit and 2) the borrower is rated. This finding makes sense as liquidity insurance is the main purpose of lines of credit and a rating is a necessary condition for accessing the commercial paper market. As such, rated borrowers are more likely to benefit from the natural liquidity hedge position of banks. Gatev and Strahan (2009) also confirm that the liquidity insurance effect on the fraction of banks in the syndicate is fully attributable to the passive lenders in the syndicate; that is, the lenders who provide funding, but are not directly involved in maintaining a relationship with the borrower.

Are banks special when illiquidity strikes in the context of our paper as well? In our paper, illiquidity corresponds to an idiosyncratic liquidity shock, rather than a market liquidity shock as in Gatev and Strahan (2006, 2009). Illiquidity corresponds to borrower default in an attempt to renegotiate the loan. It involves monitoring the borrower, coordinating the workout, renegotiating the contract, and providing liquidity insurance. In contrast, in Gatev and Strahan (2009), illiquidity results in multiple borrowers drawing down funds under existing loan arrangements if these loans are lines of credit. Since there are more tasks involved in managing idiosyncratic borrower illiquidity, it is not clear a priori whether the liquidity hypothesis leads to the measurable impact it has in Gatev and Strahan (2009). This is unclear also because: 1) most of our loans are term loans (rather than lines of credit for which, as is suggested by Gatev and Strahan, 2009, the liquidity hypothesis is the strongest) and 2) it is unclear whether banks are actually in a better liquidity hedge position than nonbanks in the case of idiosyncratic borrower illiquidity.

On the other hand, in the case of lines of credit, *all* syndicate members inject liquidity when illiquidity strikes, while in our context with predominantly term loans, not every syndicate member necessarily provides liquidity insurance. In fact, the Borrower Liquidity Hypothesis suggests that large lenders carry a greater burden than small lenders and thus, also potentially, a stronger role for banks among the large, active syndicate members. Banks would also be expected to dominate the active ranks of syndicates if they are special in terms of monitoring. Diamond and Rajan (2001) present a theory as to why banks have greater incentive to exert monitoring effort than non-depository-taking institutions while Coleman et al. (2006) offer evidence regarding the uniqueness of banks in terms of monitoring. Finally, Harjoto et al. (2006) demonstrate that syndicated loan pricing differs depending on whether a commercial bank or an investment bank is the lead arranger.

In conclusion, the question as to whether banks are special lenders when it comes to dealing with idiosyncratic liquidity shocks is an empirical one. However, if banks were indeed special, the Borrower Liquidity Hypothesis suggests that the effect would surface among the large, active syndicate members. For example, a greater fraction of banks among the lenders in the higher ranks of the syndicate would tend to be associated with higher return premiums.

H3 (*Banks Are Special Hypothesis*): A greater fraction of banks among the lenders in the higher ranks of the syndicate is associated with a higher return premium.

B. The Empirical Model

Our main model is as follows:

$$\begin{aligned}
\text{Log}(\textit{Return Premium}_i) = {} & \\
& \textit{Constant 1} + \psi_1 \textit{Number of Joining Lenders}_i + \psi_2 \textit{Reserves/Short-TermDebt}_{j,t} \\
& + \psi_3 \textit{St. Dev.Income Growth}_{j,t} + \psi_4 \textit{Fraction of Banks as Large Lenders}_i \\
& + \psi_5 \textit{Long-Term Debt/GNP}_{j,t} + \psi_6 \textit{GDP Growth}_{j,t} + \psi_7 \textit{Investment}_{j,t} \\
& + \psi_8 \textit{Political Stability}_{j,t} + \psi_9 \textit{log}(\textit{GDP}_{j,t}) \\
& + \psi_{10} \textit{Government Size}_{j,t} + \psi_{11} \textit{Dummies1}_i + \textit{Error1}_{i,j,t},
\end{aligned} \tag{2}$$

$$\begin{aligned}
\text{Log}(\textit{Number of Joining Lenders}_i) = {} & \\
& \textit{Constant2} + \phi_1 \textit{Return Premium}_i + \phi_2 \textit{Credit Market Illiquidity}_i \\
& + \phi_3 \textit{Log}(\textit{Loan Size}_i) + \phi_4 \textit{Dummies2}_i + \textit{Error2}_{i,j,t}.
\end{aligned} \tag{3}$$

In Equations (2) and (3), subscripts i are used for observations at the loan level, subscripts j to indicate the country of the sovereign borrower, and t the year. Lowercase Greek letters indicate scalars, while the two uppercase Greek letters represent vectors of coefficients. Tables IV and V provide comprehensive definitions of the endogenous and exogenous variables. Below, we review the most important definitions and relate their coefficients to the hypotheses.

Equation (2) has two variables specific to the loan contract, namely the *Number of Joining Lenders* (the number of lenders that joined the syndicate during the general syndication phase) and the *Fraction of Banks as Large Lenders* (the fraction of banks among the lenders in one of the higher ranks of the syndicate). According to the Borrower Liquidity Hypothesis, the coefficient of the former variable is positive ($\psi_1 > 0$), and the Banks Are Special Hypothesis predicts the coefficient of the latter is also positive ($\psi_4 > 0$). The other variables in Equation (2) are macroeconomic and political indicators at the country level and a set of dummies at the loan level. The choice of the macroeconomic indicators is in line with the literature on international sovereign debt (Boehmer and Megginson, 1990; Cline, 1995; Eichengreen and Mody, 2000; Block and Vaaler, 2004; Hale, 2007; Ciarlone et al., 2009; Hallak, 2009). *Reserves/Short-Term Debt* is the amount of foreign currency reserves available to the government and central bank of the sovereign borrower divided by the outstanding amount of short-term (maturity less than one year) public and publicly guaranteed debt denominated in foreign currencies. *Reserves/Short-Term Debt* is a standard proxy for borrower liquidity as an increase improves the ability of the sovereign borrower to weather temporary financial troubles, hence reducing the likelihood that the borrower needs to renegotiate its outstanding debt. The Borrower Liquidity Hypothesis predicts that *Reserves/Short-Term Debt* has a negative impact on the *Return Premium* ($\psi_2 < 0$). Another variable that may affect the likelihood of short-term liquidity shortages is *St. Dev. GDP Growth*, the standard deviation of the GDP growth rate in the five years prior to the year (t) the loan is issued. Generally, greater values of *St. Dev. GDP Growth* mean a greater likelihood of a temporary liquidity shortage, so that the Borrower Liquidity Hypothesis suggests its coefficient is positive ($\psi_3 > 0$). In Lee (1991), *St. Dev. GDP Growth* is used as a proxy for potential information issues, rather than illiquidity. The expectation regarding the sign of the coefficient of *St. Dev. GDP Growth* would also be positive according to the Borrower Liquidity Hypothesis if Lee's (1991) interpretation is correct.

We next turn to the variables that capture the likelihood of insolvency where the sovereign borrower feels its long-term prospects do not justify debt repayment and decides to repudiate the

Table IV. Description of Endogenous Variables

Both endogenous variables are based on lenders that joined the syndicate during the general syndication stage. That is, we made sure, in a manual check of each loan, to exclude mandated arrangers and/or underwriters as well as their respective fee payments.

Variable	Description
Return Premium	Difference in the yearly return between the largest and the smallest syndicate members expressed as a fraction of the yearly return of the smallest members: $$\frac{\textit{all-in margin}_{\text{high}} - \textit{all-in margin}_{\text{low}}}{\textit{all-in margin}_{\text{low}}}$$ $\textit{All-in margin}_{high}$ is the sum of the interest spread and the annualized highest upfront fee. The annualization is done over the average lifetime of the loan, while the interest spread takes into account possible variations over the lifetime of the loan whenever indicated (e.g., 20 bp over Libor during Years 1-2 and 30 bp in Years 3-5). Annualized $\textit{all-in}_{\text{low}}$ is the sum of the interest spread and the annualized lowest upfront fee.
Number of Joining Lenders	Number of lenders in the syndicated loan that were not mandated arrangers and/or underwriters.
Endogenous variables used for robustness analysis (see Table VII).	
Total Number of Lenders	Total number of lenders participating in the syndicate (i.e., number of joining lenders plus the number of participating mandated arrangers and underwriters).

Source: Thomson One Banker, Thomson Reuters. Endogenous variables in Equations (2) and (3).

contract. Empirical studies indicate that insolvency is an important determinant for the interest spread; however, the Borrower Liquidity Hypothesis yields no prediction as to the impact of insolvency on the *Return Premium*. We nevertheless included the insolvency variables as controls since they could have a potential impact on the return premium. For instance, it could be that the borrower needs large lenders for the provision of a particular service above and beyond the services they offer in workouts. Equation (2) contains the following proxies for borrower insolvency. *Long-Term Debt/GNP* is the ratio of the amount of foreign-currency-denominated public and publicly guaranteed long-term debt to GNP. *GDP Growth* is the average growth rate of GDP in the constant local currency unit over the previous five years. *Investment* is the investment share of GDP of the country of the sovereign borrower. *Political Stability* is the number of years that have passed since the most recent political regime change (e.g., a transition from a dictatorship to democracy). Regime shifts increase the chance that governments repudiate their outstanding sovereign debt suggesting the variable is inversely related to the likelihood of insolvency.

Finally, let us discuss the other controls in Equation (2). *GDP* is the sovereign country's GDP in constant 2000 US dollars. There are two reasons why there may be a negative correlation between

Table V. Description of Exogenous Variables

Variable	Description
Variables Affecting the Likelihood of Illiquidity/Renegotiation	
Reserves/Short-Term Debt	Ratio of the country's foreign currencies reserves relative to the amount of foreign-currency-denominated public and publicly guaranteed (PPG) debts with a lifetime of a year or less. (*Source*: Global Development Finance, World Bank)
St. Dev. GDP Growth	Standard deviation GDP growth rate of the issuer's country (in constant local currency). For country j of the sovereign borrower and year t: $\text{St. Dev. GDP Growth}_{j,t} = \sqrt{\sum_{k=t-4}^{t} \frac{(\text{GDP Growth}_{i,j} - \text{Average GDP Growth}_t)^2}{5}}$ (*Source*: World Development Indicators, World Bank)
Debt Service/Exports	Ratio of total foreign debt service relative to exports of goods and services. (*Source*: Global Development Finance, World Bank)
Variables Affecting the Likelihood of Insolvency/Repudiation	
Long-Term Debt/GNP	Ratio of foreign-currency-denominated PPG debt with a lifetime of more than a year and GNP. (*Source*: Global Development Finance, World Bank) (*Source*: Global Development Finance, World Bank)
GDP Growth	Yearly growth rate of GDP in constant local currency averaged over the previous five years. (*Source*: World Development Indicators, World Bank)
Investment	Investment share of GDP. (*Source*: Penn World Data, University of Pennsylvania)
Political Stability	Political Stability. Number of years since the most recent political regime change in the country. (*Source*: The Polity IV Project, Center for Systemic Peace).
Other Variables	
Fraction of Banks as Large Lenders	Large lenders are defined as syndicate members in the ranks "colead manager," "lead manager," "senior lead manager," "senior manager," "senior colead manager," "coordinating arranger," "coordinator," "agent," "coagent," "arranger," or "coarranger." *Fraction of Banks as Large Lenders* = ratio of the number of depository institutions in these ranks and the number of banks in these ranks.
GDP	GDP of the country in constant US dollars. (*Source*: World Development Indicators, World Bank)
Government Size	Government Share of GDP. (*Source*: Penn World Tables, University of Pennsylvania)

(Continued)

Table V. Description of Exogenous Variables (*Continued*)

Variable	Description
Credit Market Illiquidity	Yield spread between 30-year US Corporate BAA bonds and the 30-year US Treasury yield averaged over the first 20 working days after the mandate date. (*Source*: Board of Governors of the Federal Reserve System and Datastream International)
Loan Size	Size of the facility in millions of 1995 US dollars. The computation is based on monthly US consumption prices. Inflation figures provided by the US Department of Labor.
Share Top 5 Banks	(Joint) share of the loan provided by the five largest providers. (*Sources*: Thomson One Banker, DealScan, Loanware, Factiva, LexisNexis, and authors' analysis)
Dummy Variables	
dRefinance	The loan refinances a previous loan (a refinancing is not a renegotiation).
dFirm	The borrower is a firm (which is guaranteed by a sovereign).
dRevolving Credit	The loan is a revolving credit.
dTax Spare	The loan includes a clause that partially or fully exempts interest payments of withholding tax.
dWorld Bank Co-Financing	The loan is cofinanced (but not guaranteed) by the World Bank.
dTrade	The primary purpose of the loan is "export-import financing."
dGrace	The loan includes a grace period.
d1982-1983	The loan was mandated in 1982 or in 1983.
d1990-2006	The loan was mandated in the period 1990-2006.

GDP and the return premium ($\psi_9 < 0$). First, bigger players may be better known, therefore suffering less from potential information issues, just as borrower size is often associated with fewer information asymmetries in corporate credit markets (Diamond and Verrecchia, 1991; Bharath et al., 2007). As such, the Borrower Liquidity Hypothesis would suggest $\psi_9 < 0$. Second, countries with higher *GDP* are more prone to tap the international debt markets frequently such that default (be it to renegotiate or to repudiate) is more costly for these countries. Consequently, greater GDP improves fiscal discipline reducing anticipated renegotiation costs and return premiums. *Government Size* is the government's share of GDP of the country. *Government Size* may be relevant as larger governments tend to be less efficient or less likely to be able to raise taxes to service debt. As such, greater values of *Government Size* would be associated with a greater likelihood of illiquidity and greater values of the return premium ($\psi_{10} < 0$). The *Dummies* in Equation (2) are a vector of dummy variables. *dRefinance* is equal to one if the purpose of the funds is to refinance an existing loan. *dFirm* denotes whether the borrower is a firm (guaranteed by a sovereign entity). *dRevolving credit* indicates whether the loan is a revolving credit. *dTax Spare* denotes whether the interest payments received by the lenders are exempt from withholding taxes, while *dWorld Bank Co-Financing* determines whether the World Bank finances or cofinances a tranche of the loan. *dTrade* determines the purpose of the loan is trade finance, whereas *dGrace* indicates that the borrower has been granted a grace period. *d1982-1983* represents the years of the Latin American sovereign debt crisis and *d1990-2006* covers the period 1990 to 2006. These dummies were included because there are either theoretical considerations as to why they would potentially matter or because our estimations repeatedly indicated that the dummies were significant and raised the explained variation in the data. For example, according to Preece and

Mullineaux (1996), refinancing is associated with less information asymmetry. Therefore, the Borrower Liquidity Hypothesis would predict *dRefinance* has a negative coefficient. The choices for the time dummies are based on commonly accepted major events in the sovereign debt market. The years 1982 and 1983 are considered to be the worst years of the Latin American debt crisis (i.e., the years of the first sovereign debt defaults since the 1930s). These defaults rocked the sovereign debt markets and led to a decade of major renegotiation plans like the Baker plan, which failed, and the Brady plan that was adopted in 1989 marking the end of an era.[11]

We next turn to Equation (3). *Credit Market Illiquidity* is the yield spread in basis points between representative portfolios of US 30-year Corporate BAA Bonds and 30-year US Treasury Bonds. A larger value of the yield spread indicates that, as a whole, lenders are more cautious in terms of increasing their credit risk exposure. Such unwillingness to lend may mean smaller individual commitments. Therefore, we anticipate *Credit Market Illiquidity* has a positive effect on the *Number of Joining Lenders* ($\varphi_2 > 0$). *Loan Size* is the size of the loan facility expressed in 1995 US dollars. Ongena and Smith (2000) and Machauer and Weber (2000) have demonstrated that the loan size positively affects the number of lending relationships suggesting $\varphi_3 > 0$. The dummies we included are *dRefinance*, *d1982-1983,* and *d1990-2006*. Borrowers that refinance their loans have a tendency to work with a subset of their existing lenders.

C. Estimation

The causality between the two endogenous variables in Equations (2) and (3) may well be bidirectional. For instance, the return premium may be chosen in light of the anticipated number of lenders in the syndicate (the Borrower Liquidity Hypothesis), while it may also affect commitment amounts and the number of joining lenders at the same time (the Syndicate Structure Hypothesis). However, Hausman tests for endogeneity failed to reject that the *Number of Joining Lenders* is exogenous in Equation (2), and the *Return Premium* is exogenous in Equation (3). To be sure, we have estimated Equations (2) and (3) both as a system of equations, as well as using two separate OLS estimations. We used 2SLS as our systems estimator since it is more robust to potential specification errors than 3SLS (Wooldridge, 2002).

The 2SLS results are in the first two columns while the OLS results can be found in the last two columns of Table VI. The results indicate that both estimators yield quite similar estimated coefficients. The next section discusses what our results teach us concerning our hypotheses.

III. Results

A. Anticipated Liquidity Problems and the Return Premium

The findings reported in Table VI are all consistent with the main Borrower Liquidity Hypothesis that the return premium compensates large lenders for services offered in case of liquidity problems of a borrower. First, both the 2SLS (Column 1) and the OLS results (Column 3) suggest that *Reserves/Short-Term Debt* (our measure for liquidity) and *St. Dev. GDP Growth* (illiquidity) are significant with a negative and positive sign, respectively. Second, the *Number of Joining Lenders* has a positive significant coefficient. Finally, our estimates tentatively suggest that information problems increase the return premium. The estimated coefficient of our information

[11] Thus, the inclusion of the dummy *d1990-2006*, which appears to be associated with slightly lower return premiums. We also tried including dummies to investigate the potential impact of the Mexican economic crisis (January-July 1995), the Asian financial crisis (August 1997-April 1998), and the Russian financial crisis that followed (September 1998-October 1998). However, none of these dummies were significant.

Table VI. Main Results

The specifications of the models are found in Equations (2) and (3) in the main text. Variables are defined in Tables IV and V. The first two columns report the two-stage least squares (2SLS) estimates of Equations (2) and (3), and the last two columns the ordinary least squares (OLS) estimates of Equations (2) and (3), respectively. Regression results for the dummies *dTax Spare*, *dWorld Bank Co-Financing*, *dTrade*, *dGrace*, and *d1982-1983* are not reported. The *p-values* are given in parentheses and are based on robust variance estimators clustered on borrower.

Specification	**Equations (2) and (3)**		**Equation (2)**	**Equation (3)**
Dependent Variable	**Log(*Return Premium*) (1)**	**Log(*Number of Joining Lenders*) (2)**	**Log(*Return Premium*) (3)**	**Log(*Number of Joining Lenders*) (4)**
Log(*Return Premium*)		0.123		0.166***
		(0.136)		(0.000)
Log(*Number of Joining Lenders*)	0.208*		0.260***	
	(0.073)		(0.000)	
Reserves/Short-Term Debts	−0.055**		−0.055**	
	(0.040)		(0.040)	
St. Dev. GDP Growth	6.882**		6.970**	
	(0.028)		(0.024)	
Fraction of Banks as Large Lenders	0.747**		0.751**	
	(0.028)		(0.028)	
Long-Term Debts/GNP	0.030		0.052	
	(0.941)		(0.896)	
GDP Growth	−1.213		−1.182	
	(0.680)		(0.683)	
Investment	0.013		0.011	
	(0.231)		(0.247)	
Political Stability	−0.004		−0.005	
	(0.374)		(0.310)	
Log(*GDP*)	−0.093**		−0.092**	
	(0.022)		(0.022)	
Government Size	0.012**		0.013**	
	(0.037)		(0.029)	
Credit Market Illiquidity		0.133		0.137
		(0.140)		(0.125)
Log(*Loan Size*)		0.435***		0.436***
		(0.000)		(0.000)
dRefinance	−0.150	−0.246**	−0.141	−0.236**
	(0.341)	(0.021)	(0.379)	(0.030)
dFirm	0.195		0.210*	
	(0.126)		(0.074)	
dRevolving Credit	−0.209*		−0.212*	
	(0.088)		(0.083)	
d1990_2006	−0.428***	−0.255***	−0.401***	−0.243***
	(0.007)	(0.005)	(0.006)	(0.008)
Constant	−1.818	0.853**	−2.010*	0.956***
	(0.139)	(0.012)	(0.084)	(0.001)
R^2	36.1	44.9	36.3	45.1
Number of observations	288	288	288	288

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

variable Log(*GDP*) is significant and with the expected negative sign. However, the sign of *dRefinance* is statistically insignificant.

Taken together, these results demonstrate strong support for the Borrower Liquidity Hypothesis. Lenders appear to anticipate potential liquidity problems of borrowers and they recognize that large lenders will step up in the case of renegotiations and carry a disproportionally larger share of the costs associated with it. Although syndicated lending arrangements do not explicitly bind larger lenders to monitor borrowers, coordinate lenders, and provide liquidity in workouts, their greater exposure may give them the incentive to take the lead. Lending is a repeated game and larger lenders that do not act in a way that is consistent with their perceived role may lose reputational capital (Sharpe, 1990; Panyagometh and Roberts, 2010). Furthermore, it may be that large lenders are in a better position to pressure the borrower and other lenders into signing a new agreement.

B. The Return Premium and the Number of Joining Lenders

According to the Syndicate Structure Hypothesis, *Return Premium* has a negative effect on the number of lenders that join the syndicate when adequately controlling for other relevant factors. However, Column 2 of Table VI, with the 2SLS estimation of Equation (3), reveals that Log(*Return Premium*) has no significant impact on *Number of Joining Lenders*. The OLS results reported in Column 4 seem to even suggest a positive significant coefficient, contrary to the prediction of the Syndicate Structure Hypothesis. However, a causal interpretation of this coefficient in the OLS regression would be premature at best in light of the evidence in support of the Borrower Liquidity Hypothesis, which predicts the causality between these two variables runs in the other direction. Either way, the 2SLS estimation results lead us to reject the Syndicate Structure Hypothesis. Our supporting evidence for the Borrower Liquidity Hypothesis presumably means that arrangers attempt to limit the size of syndicates; however, these results indicate they do not use *Return Premium* as the instrument to do so.

Our 2SLS and OLS results point in the same direction as to the other coefficients of Equation (3). First, $\varphi_2 > 0$, indicating that *Credit Market Illiquidity* has a positive effect on *Number of Joining Lenders*. Additionally, $\varphi_3 > 0$, indicating that the size of the facility also has a positive impact. Both these findings suggest that lenders are risk-averse and limit their exposure to any particular sovereign borrower. Furthermore, we find that $\varphi_4 < 0$; loan refinancings are associated with a decrease in the number of lenders. Risk aversion can once again explain this result. Refinancings are associated with improved track records of borrowers (that have paid off their debt after all). Risk-averse lenders could therefore be prepared to increase their individual commitments thereby reducing the number of lenders.

C. Banks, Nonbanks, and the Return Premium

We now examine whether banks Are special lenders when it comes to dealing with idiosyncratic liquidity shocks. As explained before, the Banks Are Special Hypothesis predicts that a greater fraction of banks among the lenders in the higher ranks of the syndicate tends to be associated with a higher return premium.

Table VI reveals that the coefficient of *Fraction of Banks as Large Lenders* is indeed positive and significant suggesting that depository institutions are special in dealing with borrower liquidity problems, and that they charge borrowers more in light of this. This result was strengthened in an additional regression in which we replaced *Fraction of Banks as Large Lenders* by *Fraction of Banks as Small Lenders*. The estimated coefficient of *Fraction of Banks as Small Lenders* was insignificant and close to zero, pointing to a generally passive role for small lenders (results are available upon request).

Despite the theoretical appeal of these results in support of the Banks Are Special Hypothesis, we would like to interpret them with caution, notably because the value of 0.932 for the average fraction of banks in the lending syndicates in our data set is quite high (Table III). A comparable percentage is not reported in Gatev and Strahan (2009). However, the fractions they report make it clear that the fraction of banks in the lending syndicates in their data set is around 80% to 85%.[12] While fractions of about 80% to 85% are arguably also high, they are lower than in our study, which suggests that the variation of the fraction-of-banks variables in Gatev and Strahan (2009) are higher than is the case in our data.

IV. Robustness Analysis

A. General

How robust are the regression results of the previous section? In the course of the study, we explored a variety of alternative more specifications, which presented a picture that is very consistent with the reported findings.

We also estimated Equation (2), our main equation, using the robust regression option *rreg* of *STATA*; that is, the estimator by Hamilton (1991), which is based on an iterative procedure whereby observations with high residuals in early iterations are assigned lower weights in the final regression that yields the estimates. The results of the *rreg* estimation are reported in the first column of Table VII. The estimated coefficients using the *rreg* are of the same sign and order of magnitude as those in Columns 1 and 3 of Table VI. However, note that *Reserves/Short-Term Debt*, one of our two main proxies for anticipated borrower illiquidity, is now only just (i.e., at the 10% level) statistical significant, *Political Stability* becomes just significant as well, and the firm dummy *dFirm* now becomes statistically significant. One interpretation for the significant and positive firm dummy is that firms are more prone to have liquidity problems than the sovereigns that back them up.

Finally, we estimated Equation (1) using a reduced sample of observations. In our original estimates, we used dummy variables to control for the presence of the World Bank cofinancing in tranches of the credit facility and/or the inclusion of tax spare clauses. However, there are merely 24 loans for which one or both these dummies become one and a casual observation suggested these loans may be somewhat idiosyncratic. The OLS estimates without these 24 observations are reported in the Column 2 of Table VII. They are quite similar to the OLS estimates based on all 288 observations (see Table VI, Column 3).

B. The Proxy for Borrower Liquidity

A key variable in our analysis is *Reserves/Short-Term Debt*, a commonly used proxy for anticipated borrower liquidity in the sovereign debt literature. However, the sovereign debt literature uses an alternative measure as well, *Debt Service/Exports*, the ratio of the external debt service to exports of the country of the borrower. Replacing the liquidity proxy *Reserves/Short-Term Debt*

[12] Specifically, in Gatev and Strahan (2009), the fractions of bank lenders are 94% and 91% for lines of credit and term loans, respectively, extended to investment-grade borrowers; 80% and 62% for lines of credit and term loans, respectively, extended to speculative-grade borrowers; and 88% and 79% for lines of credit and term loans, respectively, extended to unrated borrowers.

Table VII. Robustness Analysis

Variables are defined in Tables IV and V. The 1 Column reports estimates of Equation (2) using the robust estimation method suggested by Hamilton (1991). Column 2 presents the OLS estimates of Equation (2) using a data set without the loans with either World Bank cofinancing or a tax-spare clause. Column 3 portrays OLS estimates of an equation obtained by replacing *Reserves/Short-Term Debts* by *Debt Service/Exports* in Equation (2). Column 4 reports OLS estimates of a model obtained by replacing the endogenous variable of Equation (3) by *Total Number of Lenders*. Regression results for the dummies *dTax Spare, dWorld Bank Co-Financing, dTrade, dGrace,* and *d1982-1983* are not reported. The *p-values* are given in parentheses and are based on robust variance estimators clustered on borrower.

Specification	**Equation (2)**	**Equation (2)**	**Equation (2')**	**Equation (3')**
Dependent Variable	**Log(*Return Premium*) (1)**	**Log(*Return Premium*) (2)**	**Log(*Return Premium*) (3)**	**Log(*Total Number of Lenders*) (4)**
Log(*Return Premium*)				0.120***
				(0.002)
Log(*Number of Joining Lenders*)	0.274***	0.242***	0.251***	
	(0.000)	(0.000)	(0.000)	
Reserves/Short-Term Debts	−0.048*	−0.058**		
	(0.073)	(0.031)		
Debt Service/Exports			0.013**	
			(0.041)	
St. Dev. GDP Growth	6.734**	6.579**	8.354***	
	(0.011)	(0.030)	(0.008)	
Fraction of Banks as Large Lenders	0.758*	0.722**	0.694**	
	(0.067)	(0.040)	(0.045)	
Long-Term Debts/GNP	0.049	0.124	−0.008	
	(0.892)	(0.780)	(0.986)	
GDP Growth	−1.553	−0.953	−0.275	
	(0.418)	(0.731)	(0.922)	
Investment	0.007	0.010	0.013	
	(0.397)	(0.285)	(0.181)	
Political Stability	−0.007*	−0.005	−0.004	
	(0.074)	(0.261)	(0.363)	
Log(*GDP*)	−0.078*	−0.097**	−0.102**	
	(0.065)	(0.021)	(0.020)	
Government Size	0.016**	0.012*	0.012*	
	(0.014)	(0.061)	(0.055)	
Credit Market Illiquidity				0.080
				(0.241)
Log(*Loan Size*)				0.447***
				(0.000)
dRefinance	−0.074	−0.130	−0.177	−0.232**
	(0.592)	(0.424)	(0.263)	(0.012)
dFirm	0.187**	0.206*	0.193	
	(0.050)	(0.082)	(0.104)	
dRevolving Credit	−0.232	−0.203*	−0.240*	
	(0.161)	(0.090)	(0.069)	
D1990_2006	−0.384***	−0.396***	−0.362**	−0.162**
	(0.001)	(0.007)	(0.011)	(0.018)
Constant	−2.382**	−1.795	−2.213*	1.090***
	(0.047)	(0.133)	(0.066)	(0.000)
R^2	–	33.2	36.8	53.3
Number of observations	288	264	288	288

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

by *Debts Service/Exports* in Equation (2) does not materially affect our results.[13] A comparison of Column 3 in Table VI and Column 3 in Table VII reveals that the regression results with either proxy are very close. The replacement of *Reserves/Short-Term Debt* by *Debts Service/Exports* even raises the goodness of fit slightly, from an R^2 of 36.3% to 36.8%.

C. Beyond the Number of Joining Lenders

The idea behind the Syndicate Structure Hypothesis was to test whether *Return Premium* is the instrument used by arrangers to target the number of lenders that join the syndicate. Our analysis failed to support this hypothesis. It could be, however, that *Return Premium* does not really target the number of joining lenders, as well as the overall size of the lending syndicate (i.e., including the arrangers and the agent bank).[14] In Column 4 of Table VII, we report the results of a regression in which we replaced the endogenous variable of Equation (3) by *Total Number of Lenders*. The estimated coefficients are quite close to the OLS estimates of Equation (3) (Column 4 of Table VI). Making the same replacement and using 2SLS to reestimate Equation (2) also yield results that are similar to the ones reported in Table VI (results not reported). There is a close connection between the number of lenders that join the syndicate and the size of the syndicate, even in terms of the magnitudes of the variables.

Does a careful choice of the return premium target something other than the syndicate size? While in Bolton and Scharfstein (1996), coordination costs are reduced by reducing the number of lenders, it is a small step to extend this logic to argue that a greater concentration of the committed amounts will also achieve lower coordination costs. Workouts may run smoothly as long as a select number of lenders bring in a high enough fraction of the committed funding. Holmström and Tirole (1997) and Carletti (2004) demonstrate theoretically that only a part of a firm's debt needs to be financed by "monitoring firms" to deter strategic default. The remaining external capital may carry "soft" constraints. Consequently, the return premium may perhaps not target the number of lenders but rather a certain degree of concentration of the funding commitments of the syndicate members. The prediction would be that higher return premiums tend to imply a higher concentration of commitments, as measured by, for example, the Herfindahl-Hirschman Index (Esty and Megginson, 2003; Lee and Mullineaux, 2004; Sufi, 2007) or the share of the total funding committed by the largest three or five lenders (Ongena and Smith, 2000; Esty and Megginson, 2003).

We have information regarding the individually committed amounts of the syndicate members for 78 of the 288 loans in our sample. For most loans, we also have information about the amounts that lenders are required to provide to obtain a given rank. For instance, "Managers commit between \$5m and \$7.5 m, Lead Managers between \$7.5 m and \$15 m . . . ." Based on the available information, we define a new variable, *Share Top 5 Lenders*, (i.e., the estimated fraction of the loan provided by the five largest lenders) and use it to analyze whether the return premium targets the concentration of the commitments amounts.[15] Specifically, we replace *Number of Joining Lenders* with *Share Top 5 Lenders* in Equations (2) and (3) and tested whether the return premium has the presumed positive impact on *Share Top 5 Lenders*.

Table VIII reports the regression results. A comparison with Table VI (the relevant benchmark) reveals the replacement of *Number of Joining Lenders* with *Share Top 5 Lenders* leads to a worse

[13]Notice that *Debts Service/Exports* is a proxy for liquidity *shortages*, so its coefficient should have a positive sign according to the Borrower Liquidity Hypothesis.

[14]We thank an anonymous referee for suggesting we pursue the analysis reported in this subsection.

[15]Details regarding the construction of our top five concentration index are available from the authors.

Table VIII. Bank Concentration and the Return Premium

Equations (2'') and (3'') are as specified as Equations (2) and (3), but with *Share Top 5 Lenders* replacing *Number of Joining Lenders*. Variables are defined in Tables IV and V. The first two columns report the two-stage least squares (2SLS) estimates and the last two columns the ordinary-least squares (OLS) estimates of Equations (2'') and (3''). Estimated coefficients for the dummies *dTax Spare, dWorld Bank Co-Financing, dTrade, dGrace,* and *d1982-1983* have not been reported. The *p-values* are given in parentheses and are based on robust variance estimators clustered on borrower.

Specification	**Equations (2") and (3")**		**Equation (2'')**	**Equation (3'')**
Dependent Variable	**Log (*Return Premium*) (1)**	**Log(*Share Top 5 Banks*) (2)**	**Log(*Return Premium*) (3)**	**Log(*Share Top 5 Banks*) (4)**
Log(*Return Premium*)		−0.011		−0.024
		(0.860)		(0.549)
Log(*Share Top 5 Banks*)	−0.251*		−0.131*	
	(0.083)		(0.098)	
Reserves/Short-Term Debts	−0.052*		−0.054**	
	(0.059)		(0.049)	
St. Dev. GDP Growth	6.788**		6.664**	
	(0.035)		(0.042)	
Fraction of Banks as Large Lenders	0.760**		0.745**	
	(0.024)		(0.030)	
Long-Term Debts/GNP	0.136		0.042	
	(0.749)		(0.920)	
GDP Growth	−1.488		−1.417	
	(0.619)		(0.644)	
Investment	0.015		0.016	
	(0.148)		(0.107)	
Political Stability	−0.004		−0.003	
	(0.483)		(0.550)	
Log(*GDP*)	−0.091**		−0.094**	
	(0.026)		(0.024)	
Government Size	0.008		0.008	
	(0.191)		(0.188)	
Credit Market Illiquidity		0.015		0.013
		(0.840)		(0.852)
Log(*Loan Size*)		−0.365***		−0.365***
		(0.000)		(0.000)
dRefinance	−0.160	0.221**	−0.173	0.218**
	(0.320)	(0.028)	(0.274)	(0.031)
dFirm	0.183		0.159	
	(0.153)		(0.196)	
dRevolving Credit	−0.234*		−0.216*	
	(0.062)		(0.092)	
d1990_2006	−0.479***	0.102	−0.506***	0.098
	(0.002)	(0.129)	(0.001)	(0.150)
Constant	−0.328	5.322***	−0.672*	5.290***
	(0.787)	(0.000)	(0.558)	(0.000)
R^2	32.3	40.4	32.8	40.4
Number of observations	288	288	288	288

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

fit in terms of R^2. Table VIII also reveals that there is no support for the hypothesis that the return premium targets a certain concentration of the funding amounts of the individual syndicate members. The coefficient of *Return Premium* in *Share Top 5 Lenders* equation is statistically insignificant in both the OLS regression (Table VIII, Column 4) and the theoretically more appealing 2SLS regression (Table VIII, Column 2).

D. The Role of the Interest Spread

The analysis of this paper has shown that the return premium is an economically and statistically significant loan pricing variable. How does the return premium relate to the interest spread, which is chosen simultaneously when designing the loan contract? Do these two loan pricing variables comove in some predictable way? For instance, it is conceivable there is a negative trade-off between the interest spread and the return premium? It could be that borrowers face a menu of choices ranging from a "low" interest spread paired with a "high" return premium to a "high" interest spread paired with a "low" return premium. In fact, in light of the Borrower Liquidity Hypothesis, it could be that the former option caters to borrowers that are more likely to face ex post liquidity problems, and the latter toward borrowers that are less likely to run into liquidity problems. Syndicate members lending to such liquid borrowers may essentially all earn the same rate of return because the probability of idiosyncratic liquidity shocks is small.

To investigate whether there tends to be a trade-off between the return premium and the interest spread, we regressed the return premium on all variables in Equation (2) in addition to a new variable, *All-In Spread Residual*. *All-In Spread Residual* is a variable generated by regressing the (logarithm of the) all-in spread drawn (interest spread plus any utilization and facility fees) on all the right-hand-side variables of Equation (2). By design, *All-In Spread Residual* is orthogonal to the right-hand-side variables of Equation (2); hence, regressing the return premium on the variables of Equation (2) plus *All-in Spread Residual* should yield coefficients that are identical to the ones reported in Column 3 of Table VI. Furthermore, the estimated coefficient of *All-In Spread Residual* reveals the trade-off between the all-in spread and the return premium.[16]

Column 1 of Table IX reports the regression results. We observe that the estimated coefficients of the original variables are indeed identical to those in Column 3 of Table VI and that their statistical significance is affected very little. The regression results in Column 1 of Table IX unveil a significant negative coefficient for *All-In Spread Residual*. This suggests the presence of a negative trade-off between the interest spread and the return premium after controlling for other relevant variables. Borrowers indeed appear to face a menu of choices ranging from a "low" interest spread paired with a "high" return premium, to a "high" interest spread paired with a "low" return premium.

We also investigated the potential impact of the interest spread on *Number of Joining Lenders*. Hao and Roberts (2007) find the all-in spread has a positive impact on both the number of lead lenders, as well as the syndicate's total number of lenders. However, Column 2 of Table IX

[16]That is, the estimated coefficient of *All-In Spread Residual* coincides with the estimated coefficient of (logarithm of the) *All-In Spread* itself, had we included the latter variable in Equation (2) rather than the former. However, if we had included *All-In Spread* in Equation (2), the estimated coefficients of the other variables would have become difficult to interpret because it is "... difficult to interpret what has actually been estimated" (Wooldridge, 2002). The source of the issue is that the return premium and the interest spread are both endogenous loan pricing variables implying that our return premium equation ceases to be a structural equation once the interest spread is included. Our approach of including *All-In Spread Residual* to resolve the described statistical issue is inspired by Esty and Megginson (2003). However, Esty and Megginson's (2003) "loan pricing residual" variable has been obtained from preregressing their loan pricing proxy on variables other than just the exogenous variables in the equation itself; hence, it still affects their estimated coefficients and the interpretation of the estimation results.

Table IX. Robustness Check on All-In Spreads

Table IX presents OLS estimates of the models in Equations (2) and (3) after adding *All-In Spread* or *All-In Spread Residuals*. *All-In Spread* is the sum of the interest spread and any utilization and facility fees. *All-in Spread Residuals* are the residuals obtained by estimating log(*All-In Spread*) on all the variables of Equation (2). Regression results for the dummies *dTax Spare, dWorld Bank Co-Financing, dTrade, dGrace,* and *d1982-1983* are not reported. The *p-values* are given in parentheses and are based on robust variance estimators clustered on borrower.

Specification	**(1)**	**(2)**	**(3)**
Dependent Variable	**Log(*Return Premium*)**	**Log(*Number of Joining Lenders*)**	**Log(*Number of Joining Lenders*)**
Log(*All-in Spread*)		0.011	−0.043
		(0.859)	(0.449)
All-in Spread Residuals	−0.363***		
	(0.000)		
Log(*Return Premium*)		0.170***	
		(0.002)	
Log(*Number of Joining Lenders*)	0.260***		
	(0.000)		
Reserves/Short-Term Debts	−0.055**		
	(0.040)		
St. Dev. GDP Growth	6.970**		
	(0.028)		
Fraction of Banks as Large Lenders	0.751**		
	(0.017)		
Long-Term Debts/GNP	0.0524		
	(0.894)		
GDP Growth	−1.182		
	(0.688)		
Investment	0.011		
	(0.234)		
Political Stability	−0.005		
	(0.292)		
Log(*GDP*)	−0.092**		
	(0.021)		
Government Size	0.013*		
	(0.067)		
Credit Market Illiquidity		0.134	0.133
		(0.145)	(0.163)
Log(*Loan Size*)		0.437***	0.432***
		(0.000)	(0.000)
dRefinance	−0.141	−0.234**	−0.280***
	(0.321)	(0.035)	(0.009)
dFirm	0.211*		
	(0.066)		
dRevolving Credit	−0.212		
	(0.104)		
d1990_2006	−0.400***	−0.249***	−0.262**
	(0.002)	(0.009)	(0.016)
Constant	−2.010	−0.924***	0.711***
	(0.074)	(0.001)	(0.009)
R^2	43.3	45.1	42.2
Number of observations	288	288	288

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

suggests that the impact of the all-in spread on *Number of Joining Lenders* is negligible in our data set. The coefficient of Log(*All-In Spread*) is insignificant and inclusion of the variable does not noticeably increase the R^2. Is the result of Hao and Roberts (2007) explained by the negative trade-off between the spread and the return premium that we detected above? An additional regression in which we excluded the return premium from *Number of Joining Lenders* equation indicates that this is not the case in our data. Column 3 of Table IX demonstrates that the interest spread remains insignificant. There are two differences between Hao and Roberts (2007) and our paper. First, Hao and Roberts (2007) analyze US corporate syndicated loans, while we use a data set of sovereign syndicated loans taken by developing countries. The second difference is the choice of the endogenous variable. Hao and Roberts (2007) focus on the number of lead banks while we focus on what is essentially its complement, the number of joining lenders.

V. Concluding Remarks

Syndicated loan contracts reveal that the rate of return offered to lenders increases in the amount they commit. Why are borrowers prepared to pay a premium to larger lenders if these lenders do not do more than providing funds? We find that the return premium paid to large lenders increases with the probability of borrower liquidity shortages and in two factors that are known to increase coordination costs between lenders in case of a workout, namely, the number of lenders and information asymmetries between the borrower and the lenders. The return premium is not affected by proxies for the probability of insolvency, such as the total debt burden. These findings suggest that large lenders obtain higher returns because they carry a disproportionately large share of the cost associated with potential idiosyncratic liquidity shocks of borrowers, most notably costs to coordinate multiple lenders, renegotiate the loan, and provide liquidity insurance.

Our evidence of the relevance of borrower liquidity problems complements Gatev and Strahan (2009) who demonstrate that potential market liquidity shocks affect syndicated loan arrangements. Our evidence also coincides with the stylized evidence we acquired from renegotiations of sovereign debt contracts. For example, Cline (1995) reports that William R. Rhodes, then Vice Chairman of Citibank, the financial institution most involved in the sovereign debt markets during the 1980s, chaired most of the Banks Advisory Committees ("London Clubs") for financially distressed Latin American countries in the 1980's. Finally, our evidence is consistent with the results reported by Dennis and Mullineaux (2000), Lee and Mullineaux (2004), and Sufi (2007) that suggest that the large lenders on lending syndicates are the most active in terms of managing the relationship with the borrower. Our study is the first that links the suggested borrower demand for active lender involvement in the case of idiosyncratic liquidity shocks to the pricing of loan contracts.

A further finding indicates that a higher fraction of banks among the lenders in the higher ranks of the syndicate is associated with greater return premiums. This finding suggests that banks are special lenders who are better equipped at addressing idiosyncratic liquidity shocks than nonbank lenders. However, it does not enable us to pinpoint whether banks are special because they are superior monitors (Coleman et al., 2006) or because they are better at providing liquidity insurance than nonbanks (Gatev and Strahan, 2006, 2009). We also interpret this result with some caution as most of the lenders in our data set are banks. Yet, it is consistent with Huang and Ramírez (2010) who demonstrate that banks gravitate toward segments of the credit market where monitoring, renegotiation, and liquidation are important.

There are three natural directions for future research. First, our loans data set comprises *sovereign* loans. Does the Borrower Liquidity Hypothesis apply in the context of the *corporate* debt market as well? Anticipated idiosyncratic liquidity problems may potentially have a different impact in the two environments as sovereign debt defaults are not governed by any bankruptcy code, while corporate debt defaults obviously are. Testing the liquidity shocks hypothesis in a corporate syndicated lending context would require substantial effort as it would involve building a data set from a number of databanks as we did in this study. A second direction for future research is to link loan pricing and syndicate structure to the actual responsibilities of individual syndicate members over the lifetime of the loan. In this study, we inferred from the pricing of the loans that the large syndicate members are the more active lenders in the case of borrower liquidity problems. However, note that a study based on direct observations regarding the tasks completed by banks would obviously require a very special data set. Finally, the syndicated loan literature has so far devoted very little attention to upfront fees. This study and Hallak (2009) have underscored that the upfront fee structure is an important loan pricing variable. One open question is whether the upfront fee structure is designed in light of certain ex ante problems in addition to the ex post liquidity problems highlighted in this study. It could be, for example, that promising a greater compensation for larger commitments could speed up the syndication process or increase the probability the loan is successfully syndicated. ■

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