Contents lists available at ScienceDirect

Journal of Financial Economics

journal homepage: www.elsevier.com/locate/jfec

Syndicated loan spreads and the composition of the syndicate ☆

Jongha Lim [a,*], Bernadette A. Minton [b], Michael S. Weisbach [b,c,d]

[a] Department of Finance, Trulaske College of Business, University of Missouri, Columbia, MO 65211, USA
[b] Department of Finance, Fisher College of Business, Ohio State University, Columbus, OH 43210, USA
[c] National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138, USA
[d] SIFR, Swedish Institute for Financial Research, Drottninggatan 98, SE-111 60 Stockholm, Sweden

ARTICLE INFO

ABSTRACT

During the past decade, non-bank institutional investors are increasingly taking larger roles in the corporate lending than they historically have played. These non-bank institutional lenders typically have higher required rates of return than banks, but invest in the same loan facilities. In a sample of 20,031 leveraged loan facilities originated between 1997 and 2007, facilities including a non-bank institution in their syndicates have higher spreads than otherwise identical bank-only facilities. Contrary to risk-based explanations of this finding, non-bank facilities are priced with premiums relative to bank-only facilities in the same loan package. These non-bank premiums are substantially larger when a hedge or private equity fund is one of the syndicate members. Consistent with the notion that firms are willing to pay a premium when loan facilities are particularly important to them, the non-bank premiums are larger when borrowing firms face financial constraints and when capital is less available from banks.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

Various types of institutional investors participate in syndicated loans. These investors have substantially different costs of providing debt capital: Commercial and investment banks expect to earn the risk-free rate plus a premium to compensate them for the default risk. In contrast, investors in hedge funds expect relatively high returns, on top of the considerable fees charged by hedge fund managers. Consequently, to justify it making an investment, a hedge fund's pre-fee expected return must be substantially higher than that for a bank. Given their different required ex ante returns, it is somewhat puzzling that both hedge funds and banks, as well as other institutions, all invest in the same syndicated loan facilities.

Why do some facilities have participation of non-bank investors while others do not? Presumably, there must be differences between facilities that are related to the identity of investors who provide the financing. One possibility is that some loan facilities are made when the supply of capital is high, so that banks are anxious to invest in them and the facility can be filled by banks at a relatively low spread. Others are made at times when it

is difficult to acquire the necessary capital from banks, so that the loan arrangers have to raise the spreads to attract other non-bank institutional investors such as hedge funds.[1] Alternatively, if the loan facility is not crucial to the firm's health and it cannot be filled at low cost by banks, the firm could choose not to borrow at all. This argument implies that when non-bank financial institutions take positions in loan facilities, there should be a higher spread than in loan facilities in which they do not take positions.

To evaluate the way in which different kinds of non-bank institutional investors are involved in the syndicated lending process, we consider a sample of 20,031 facilities of "leveraged" loans from the DealScan database, each of which was originated between 1997 and 2007.[2] We focus on the leveraged loan segment of the market because non-bank institutional investors' participation in the corporate lending market has been concentrated in this lower quality, non-investment grade segment of the market, and also because restricting the sample to leveraged loans allows the sample to be relatively homogeneous.[3] Of the 20,031 leveraged loan facilities, 13,752 are associated with a syndicate containing only commercial or investment banks (bank-only facilities), while the remaining 6,279 have syndicates containing at least one non-bank institutional investor (non-bank facilities). These institutional investors are most often finance companies (contributing to the syndicates of 4,603 loan facilities), private equity or hedge funds (2,754 loan facilities), and mutual funds (1,010 loan facilities).

We estimate the difference in spreads between loan facilities as a function of the type of the investors in a particular facility. In doing so, we control for other factors that affect the loan facility's spread, such as the firm's risk measured by either firm-level accounting variables, or the firm's credit rating, as well as the loan facility's type (term loan A, term loan B, or revolver) and other facility-specific

characteristics. Our estimates suggest that the presence of a non-bank institutional syndicate member is associated with a significantly higher spread than an otherwise similar bank-only loan facility. When we control for risk using firm-level accounting variables, our estimates imply a spread premium of approximately 54 basis points. If we instead group loans by credit rating category, the estimated spread premiums are smaller, around 22 basis points, but are still statistically significant and large enough to be economically important.

One interpretation of the non-bank premium is that the non-bank institutions are providing capital when banks have difficulty filling the syndicate, which is likely to occur when borrowing firms are facing financial constraints or when banks are restricted in providing capital. Consistent with this notion, our estimates indicate that the non-bank premiums are larger when the borrowing firm appears to be facing financial constraints and when the supply of bank capital is expected to be lower.

In computing these estimates of the non-bank premiums, we control for publicly observable variables that could affect spreads. However, it is possible that non-bank premiums could reflect unobservable differences between firms that are correlated with both the likelihood of there being a non-bank institutional syndicate member and the spreads on the loan facilities in which they invest. For example, suppose that at times when the firm is having financial problems that prevent it from receiving a loan facility from other lenders, it is more likely to have a non-bank institution in the loan facility's syndicate. In this case, it would be possible that the borrower's true risk would not be reflected in observable variables, so that the positive estimated spread premiums could reflect compensation for risk that is unobservable to an outsider.

To evaluate the possibility that the premiums to non-bank institutional investors reflect incremental risk differences between non-bank loan facilities and bank-only loan facilities, we estimate the effect of non-bank syndicate members on the pricing of different facilities *within* the same loan. Different facilities within the same loan package typically have the same seniority and hence have the same default risk. Yet, facilities usually have different maturities, sizes, and syndicate structures, so we control econometrically for differences in facility-specific attributes when estimating within-loan differences. Using this approach, the non-bank syndicate member's effect on the relative spreads on different facilities of the same loan cannot reflect a correlation between non-bank institutions' existence and a factor related to unobservable firm-level risk.

The within-loan estimates indicate that when a non-bank institution participates in a term loan B portion of the syndicate, the facility has a larger spread premium relative to term loan A facilities or revolvers of the same loan than the bank-only term loan B facilities' relative premium to term loan A or revolvers, although only the premium difference for revolvers is statistically significantly different from zero. We also consider the cases in which the non-bank institution invests in a particular type of facility and there also is another bank-only facility of the same type in the same loan. In each of these cases, the

---

[1] For example, in 2003, when banks were reluctant to increase their exposure to power companies who were having financial difficulties, hedge funds provided a substantial fraction of the capital for short-term facilities for Aquila, CMS Energy, and El Paso Corp. (*Wall Street Journal*, April 30, 2003).

[2] The technical definition of leveraged loans varies by organization. For example, DealScan defines as leveraged any loan with a credit rating of BB+ or lower and any unrated loan. Bloomberg defines leveraged loans as those with spreads over London Interbank Offer Rate (LIBOR) of 250 basis points (bp) or more. Standard & Poor's (S&P) deems loans with spreads over LIBOR of 125 bp or more as leveraged loans. Thomson Financial denotes as leveraged loans, all those with an initial spread of 150 bp or more before June 30, 2002, or 175 bp or more after July 2, 2002. We follow DealScan's classification of leveraged loans in this paper. By "non-bank" we mean an institutional investor that is neither a commercial bank nor an investment bank.

[3] The proportion of leveraged loans among loans classified as "institutional" loans by DealScan is about 90% during the sample period. Similarly, Nandy and Shao (2010) find that 86.1% of "institutional" loans are leveraged loans with the proportion increasing over the years during the period from 1995 to 2006. The definition of "institutional" facilities in this paper is different from the one used by DealScan or Nandy and Shao (2010). We focus on the actual participation as opposed to the label put on the facility and consider a loan facility to be 'institutional' if at least one non-bank (neither commercial bank nor investment bank) institutional investor is involved in the lending syndicate.

facility with the non-bank institutional investor trades at a statistically significantly higher spread. These findings confirm that facilities in which non-bank institutional investors participate have higher spreads than otherwise similar bank-only facilities, even holding borrower characteristics constant.

We also examine whether the type of non-bank syndicate member is related to the premium. We estimate this premium when we control for risk econometrically using firm-specific financial data, and also when we compare across different facilities in the same loan. Consistent with the notion that different types of institutional investors have different required ex ante rates of return, we find that when hedge or private equity funds participate in a facility's syndicate, the premium is substantially higher, about 31 basis points, than when other types of non-bank institutional investors participate in the facility's syndicate.

We also examine whether these non-bank premiums vary when the non-bank syndicate members also have equity positions at the time of the loan facility origination. When a hedge fund has an equity stake in the borrowing firm greater than 0.1 percent, the premium increases to about 60 basis points. Finally, the non-bank premiums vary positively with the fraction of the loan that is purchased by the non-bank institutional investor. These findings are consistent with the view that arrangers rely on non-bank institutional investors, especially hedge and private equity funds, as lenders of last resort, when it is difficult to raise capital for the loan facility through banks.

Our findings parallel those of Brophy, Ouimet, and Sialm (2009), who find that hedge funds' equity investments are typically to firms that otherwise would have trouble raising capital. When making equity investments, hedge funds typically negotiate discounts relative to the public stock price paid by other investors, and earn abnormal returns because their purchases are at a discount. Thus, hedge funds' abnormal returns on private placements of equity can be thought of as the return to providing liquidity. Our findings can be viewed similarly: we find that hedge and private equity funds contribute to loan facilities in firms with spreads that are relatively high. Since spreads are determined through an auction-like process, high spreads that cannot be explained by risk and other firm and loan facility attributes mean that the facility would have relatively few investors or would have difficulties in fully subscribing absent the hedge or private equity fund. Therefore, we view the spread premiums as compensation that non-bank institutional investors receive in exchange for providing liquidity to the firms in the facility that is in less demand from other investors.

Nandy and Shao (2010) compare spreads on "institutional" and "bank" facilities, and show that the term loan B facilities or what they label as institutional facilities, have higher spreads than facilities they label bank facilities, revolvers, or term loan A facilities. In contrast to Nandy and Shao (2010), our focus is on the actual participation by types of bank and non-bank institutional syndicate members as opposed to the label put on the facility. We show that the labels applied to tranches are often misleading in that institutional investors regularly participate in what

Nandy and Shao call "bank" facilities, and many tranches Nandy and Shao label "institutional" facilities have no participation by non-bank institutions.[4] Therefore, we argue that, in contrast to Nandy and Shao (2010), if one wants to measure the effect of institutional participation on spreads, one must examine their actual participation rather than rely on the labels applied to facilities.

The remainder of the paper proceeds as follows: Section 2 describes the data sources and sample. Section 3 estimates the differences in spreads between bank-only loan facilities and comparable non-bank loan facilities, and examines factors that affect the magnitude of the non-bank premium. Section 4 considers the way in which the loan's pricing varies with the types of non-bank institutional syndicate members, while Section 5 concludes.

2. Data sources and sample construction

2.1. Sample of leveraged loan facilities

We obtain our sample of leveraged loans from the Reuters Loan Pricing Corporation's (LPC) DealScan database for the 1997–2007 period. We consider a loan to be a "Leveraged loan" if it has a credit rating of BB+ or lower, or is unrated (see footnote 2). Leveraged loans in our sample are either stand-alone facilities (41.4%) or made up of term loan facilities packaged together with revolver facilities. A term loan facility is a loan facility for a specified amount, fixed repayment schedule and maturity, and is usually fully funded at origination. In contrast, revolvers typically have shorter maturities than term loan facilities and are drawn down at the discretion of the borrower. Term loan facilities are normally designated by letter, where the term loan A facility is usually amortizing, and is typically held by the lead arranger, and the remaining facilities (term loan B, C, D, E, …) are more often "bullet," meaning that they have one payoff at maturity, and are usually sold to third parties.[5]

We focus on leveraged loans because this segment of the loan market has had substantial participation of non-bank institutional investors. In addition, according to previous studies (e.g., Nandy and Shao, 2010) the overwhelming majority of "institutional" loans are leveraged

---

[4] These differences could also arise from the differences in the definition of bank. We consider both commercial and investment banks to be 'banks,' while Nandy and Shao (2010) call only commercial banks 'banks.'

[5] We treat facilities with B or higher designations (e.g., C, D, etc.) as term loan B. Moreover, about 49% of the term loans in our sample have no letter designation but are just called 'Term loan.' In all reported tables, we treat these undesignated term loans as term loan B. We do so because the facility attributes, such as the spread and payment schedule, of the unlabeled term loans in our sample appear to be more like the term loan B's than the term loan A's. Detailed comparisons of facility attributes across different facility types in our sample are provided in Appendix C. In addition, when a facility is first launched and appears in the 'Calendar,' which is the weekly record of outstanding loans published by Reuters Loan Pricing Corporation (LPC), often its type is originally described as "term loan," but ultimately is classified in DealScan as "term loan B," or vice versa. We have re-estimated all equations reported in the paper treating unclassified term loans separately and all results are similar to those reported below.

loans with the proportion increasing over time. Moreover, given that the pricing function of leveraged loans is likely to be different from that of investment grade loans, restricting the sample to leveraged loans finesses econometric difficulties that could potentially arise if we were to pool together leveraged and investment grade loans. We begin our sample in 1997 because major developments in the market that fueled institutional involvement in the corporate loan market occurred in 1995 and 1996.[6]

To construct the sample, we begin with all leveraged loan facilities listed in DealScan made to nonfinancial U.S. public firms and completed between 1997 and 2007, a total of 37,552 loan facilities. We require that the data on deal value and the date of origination be non-missing, and that the interest rate is set at a spread over LIBOR. We additionally restrict the sample to the most common type of facilities, where the type of instrument is either a line of credit (such as Revolver/Line, 364-Day Facility, Limited Line) or a term loan.[7] We further restrict the sample to the borrowing companies for which we could match to the Compustat database.[8] Finally, we exclude loans whose primary purpose is financing for a leveraged buyout. This screening process results in a sample of 20,031 facilities, associated with 13,122 loans made to 5,627 borrowing firms.

We consider a loan facility to have a non-bank institutional investor if at least one institutional investor that is neither a commercial nor an investment bank is involved in the lending syndicate. Non-bank institutions include hedge funds, private equity funds, mutual funds, pension funds and endowments, insurance companies, and finance companies.

To identify commercial bank lenders, we start from lenders whose type in DealScan is "US Bank," "African Bank," "Asian-Pacific Bank," "Foreign Bank," "Eastern Europe/Russian Bank," "Middle Eastern Bank," "Western European Bank," or "Thrift/S&L." We manually exclude the observations that are classified as a bank by DealScan but actually are not, such as the General Motors Acceptance Corporation (GMAC) Commercial Finance. Then we manually check lenders whose primary Standard Industrial Classification (SIC) code is between 6011 and 6082, or is 6712 or 6719, and add them to the list of commercial banks if appropriate. When identifying commercial banks,

we also consider finance companies affiliated with commercial banks (e.g., Foothill Capital) to be commercial banks. We do take into consideration the changes in the institutional type, so that, for example, JP Morgan is classified as an investment bank before its merger with the Chase Manhattan Corp in 2000, and JP Morgan Chase is coded as a commercial bank afterward.

To identify investment banks, we start from lenders that are classified by DealScan as investment bank. Then by manually checking each lender in this category, we reclassify lenders that are labeled as Investment Bank by DealScan but are better characterized as other types, allowing us, for example, to classify Blackstone Group as a private equity firm rather than as an investment bank. We also manually check lenders whose primary SIC code is 6211 to capture additional investment bank lenders such as RBC Capital Market. Insurance companies are identified following a similar process, focusing on the lenders labeled as "Insurance Company" by DealScan and the ones having primary SIC codes of $6311 - 6361$, 6399, or 6411.

Identifying other types of lenders is more challenging, since there are not SIC codes clearly indicating finance companies, mutual funds, or hedge funds and private equity funds. Therefore, to identify finance companies, we rely on DealScan's classification ("Finance companies"). A lender is classified as a mutual fund if its type in DealScan is either "Mutual funds" or "Institutional investor- prime funds". When a lender's type in DealScan is ambiguous (e.g., "Institutional Investor – Other," or "Other"), we further check Capital IQ to see whether it is a mutual fund. Finally, to identify hedge funds (HF) and private equity funds (PE), we start from the lenders that are labeled as "Institutional investor – Hedge fund" or "Vulture fund" in DealScan. A lender is further added to the category of HF/PE if its name appears in the Lipper TASS or Preqin databases, or if the descriptions of the lender in Capital IQ indicate that it is a privately owned hedge fund sponsor, manages private equity funds, or manages assets for high-net worth individuals.

Because our sample only includes loan facilities with floating-rate interest payments, we use the all-in-drawn spread as our measure of loan pricing. The all-in-drawn spread is the sum of the spread of the facility over LIBOR and any annual fees paid to the lender group. DealScan also provides data on the facility's size and maturity, the number of investors participating in the lending syndicate, as well as information on whether the facility is senior, secured, syndicated, having performance-based pricing, and the type of facility (revolver or term loan). We also consider the relationship among syndicate members by examining the lead lender's past relationships with the syndicate members in the current loan during the prior three years.

We match the borrower's and/or borrower's parent name to the Compustat firm by a combination of algorithmic matching and manual checking following Chava and Roberts (2008). Using this matching procedure, we are able to obtain other firm-level variables from Compustat, Center for Research in Security Prices (CRSP), Institutional Broker's Estimate System (I/B/E/S), Thomson Reuters Institutional Holding Database (13F), and Thomson Reuters

---

[6] The Loan Syndications and Trading Association (LSTA) was founded in 1995 and S&P first started rating bank loans in 1995. In 1996, LSTA first started providing mark-to-market pricing (for dealers only). In addition, the secondary market for syndicated loans became well established by the mid-1990s: by the early 1990s specialized loan trading desks were operating in a number of institutions led by Bankers Trust, Alex Brown, Bear Stearns, Citibank, Continental Bank, and Goldman Sachs. By 1997, about 25 institutions had active trading desks and there were two inter-dealer brokers. These innovations spurred the fast growth of the syndicated loan market, which in turn fueled institutional participation in the primary lending market. Moreover, there are very few leveraged loans before 1997.

[7] This restriction excludes bankers' acceptance, leases, standby letters of credit, step payment leases, guidance lines, traded letters of credit, multi-option facilities, and undisclosed loans.

[8] We are grateful to Michael Roberts for providing the DealScan-Compustat link file. In addition to using this link file, we also manually confirmed the matching between DealScan and Compustat.

Table 1
Trends in non-bank institutional participation in leveraged loan facilities.

This table presents the trends in the distribution of leveraged loan facility originations in the DealScan database during 1997–2007 by number (Panel A) and dollar value (Panel B). Column 1 reports the total number (value) of all leveraged loan facilities in our sample. Column 2 reports the total number of loan facilities in which only commercial or investment banks participated (bank-only facilities). Column 3 reports the total number (value) of loan facilities in which at least one non-bank institution is a member of the facility's syndicate (non-bank facilities). Columns 4–10 report the total number (value) of loan facilities by type of institutional syndicate member: commercial bank, investment bank, insurance company, finance company, hedge fund or private equity fund (HF/PE), mutual fund, and other. The sum of columns 4 to 10 does not add to the total number (value) in column 1 because more than one type of institution can participate in the syndicate.

| | | | | | | Type of institutional syndicate member | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
Year of origination	All facilities	Bank-only syndicate	Non-bank syndicate member	Commercial bank	Investment bank	Insurance company	Finance company	HF/PE	Mutual fund	Other
Panel A: Number of loan facilities										
1997	2,706	2,267	439	2,527	708	79	331	146	128	42
1998	2,264	1,783	481	2,111	598	80	357	154	111	73
1999	1,915	1,424	491	1,791	606	82	394	192	137	73
2000	1,780	1,324	456	1,656	524	48	349	174	93	68
2001	1,777	1,328	449	1,628	603	57	317	192	67	72
2002	1,800	1,178	622	1,653	623	73	442	280	85	79
2003	1,778	982	796	1,644	745	120	565	420	106	106
2004	1,818	941	877	1,643	879	90	638	484	142	119
2005	1,626	921	705	1,463	920	30	539	304	71	63
2006	1,365	805	560	1,198	806	21	406	228	43	27
2007	1,202	799	403	1,087	711	18	265	180	27	29
Total	20,031	13,752	6,279	18,401	7,723	698	4,603	2,754	1,010	751
Panel B: Value of loan facilities (in $ billions)										
1997	298	242	57	294	192	16	45	20	27	8
1998	258	182	76	254	158	21	58	28	24	14
1999	255	182	73	252	167	20	57	31	32	15
2000	237	159	78	232	139	13	61	32	27	17
2001	256	180	76	246	177	14	65	30	15	13
2002	231	132	99	222	162	17	79	45	20	16
2003	257	115	141	247	181	36	115	83	30	25
2004	327	155	172	307	251	22	138	95	38	22
2005	349	196	153	326	278	10	125	60	22	15
2006	342	210	132	318	272	6	107	40	18	6
2007	345	235	110	328	285	7	85	39	12	6
Total	3,160	1,990	1,170	3,026	2,262	182	935	501	266	156

SDC Platinum. The total number of leveraged loan facilities that have a full set of data for the most recent prior fiscal year-end is 12,346, of which 3,460 have participation of an institutional investor that is neither an investment bank nor a commercial bank.

2.2. Overview of sample

Table 1 provides statistics on the annual distribution of leveraged loan facilities. This table emphasizes the increasing trend of non-bank institutional participation in the leveraged loan market. The value of loan facilities with non-bank syndicate members, as well as the fraction of all leveraged loan facilities made up by loan facilities with non-bank participation, increased substantially over our sample period, from $57 billion (19% of all leveraged loans) in 1997 to $110 billion (32%) in 2007.

Table 2 presents summary statistics for all the loan facilities in our sample (20,031 facilities) (Panel A) and lender participation (Panels B, C, and D). As reported in Panel A, the average facility amount is $158 million, the average number of investors involved in a lending syndicate is about six, and the average maturity is about

47 months. Approximately 70% of facilities are secured and about 12.4% are sole-lender facilities.[9]

Panel B of Table 2 presents the frequency of bank and non-bank institutional participation, while Panels C and D report loan share information in a sample of loan facilities for which we have data on loan shares (5,624 facilities, about 25% of the sample). For this subsample, non-bank institutions participate in about 23% of the loan facilities (1,282 of 5,624). When they participate in the loan facility, non-bank syndicate members as a group own 44% of the facility, with finance companies and hedge/private equity funds each owning about a third of the loan facilities in which they invest. In addition, when non-bank institutional investors participate in a loan facility, they are the largest investor 46% of the time (Panel D).

The term loan A and revolver facilities often are referred to as bank facilities, and term loan B facilities as institutional facilities. However, our data indicate this description can be misleading. As Panels B through D show, contrary to the

---

[9] All results are similar to those reported below if we exclude sole-lender loans from the sample.

Table 2

Selected facility and lender characteristics.

This table presents sample averages of selected facility (Panel A) and lender characteristics (Panels B, C, and D). Mean values are reported for the full sample of leveraged loan facilities and for the subsamples of revolvers, term loan A facilities, and term loan B facilities. Panels B, C, and D include only loan facilities for which more than 90% of loan shares can be identified (5,624 facilities). The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. All continuous variables are winsorized at 1% and 99% levels. Definitions of the variables are provided in Appendix A.

		Facility type		
	All facilities	Revolver	Term loan A	Term loan B
Panel A: Facility characteristics				
N	20,031	12,421	956	6,654
Non-bank syndicate member	0.313	0.249	0.482	0.409
Facility amount ($M)	158.0	153.0	174.0	164.0
Number of participating lenders	6.110	5.836	9.476	6.136
Relationship score	0.074	0.076	0.105	0.068
Maturity	46.87	39.91	58.19	58.22
Secured indicator	0.701	0.666	0.719	0.763
Performance pricing indicator	0.429	0.487	0.542	0.303
Covenants indicator	0.756	0.762	0.715	0.750
Sole-lender facility indicator	0.124	0.138	0.022	0.114
All-in-drawn spread (bps)	256.6	230.1	271.4	305.8
Panel B: Participation by syndicate member type - conditional on having loan share information				
All facilities having loan share information	5,624	4,116	139	1,369
All banks	5,333	3,938	134	1,261
Commercial bank	5,274	3,910	133	1,231
Investment bank	1,535	1,127	83	325
All non-banks	1,282	784	61	437
Insurance company	119	27	6	86
Finance company	981	619	53	309
HF/PE	463	246	19	198
Mutual fund	184	47	6	131
Other lenders	125	44	3	78
Panel C: Average loan share - conditional on participation (%)				
All banks	94.7	96.0	91.8	90.9
Commercial bank	89.8	91.2	80.0	86.3
Investment bank	20.8	19.2	20.0	26.4
All non-banks	44.2	42.2	24.9	50.6
Insurance company	13.6	13.2	6.9	14.2
Finance company	35.2	35.7	19.3	36.9
HF/PE	31.8	35.6	19.0	28.3
Mutual fund	10.8	6.8	17.2	15.2
Other lenders	31.9	18.7	20.9	24.7
Panel D: Percent of syndicate member type as largest lender - conditional on participation				
All banks	96.5	97.2	97.0	94.4
Commercial bank	94.2	95.5	89.5	90.3
Investment bank	28.9	26.4	32.5	36.6
All non-banks	46.4	48.5	19.7	46.5
Insurance company	13.4	18.5	16.7	11.6
Finance company	40.9	44.3	15.1	38.5
HF/PE	29.6	37.0	15.8	21.7
Mutual fund	15.2	17.0	0.0	15.3
Other lenders	23.2	27.3	33.3	20.5

common terminology, non-bank institutions invest in term loan A and revolver facilities, and term loan B facilities are sometimes entirely held by banks. Therefore, if one wants to understand the effect of institutional participation on loan pricing, it is important to gather data on actual participation rather than to rely on the labels commonly applied to facilities.

3. Differences between bank-only and non-bank loan facilities

3.1. Univariate differences

Table 3 summarizes the univariate differences between the 6,279 non-bank and 13,752 bank-only loan facilities in our sample. Non-bank facilities are less likely to be

revolvers than bank-only facilities (49.3% vs. 67.8%), and this difference is statistically significant at the 1% level. The remaining loan facilities in the sample are term loans, so non-bank facilities are more likely to be term loan facilities than are bank-only facilities.

Within the sample of leveraged loan facilities, the non-bank facilities tend to be more risky than bank-only facilities. Of the borrowers that do have credit ratings, non-bank facilities tend to have borrowers with lower credit ratings.[10] For example, of the non-bank loan

---

[10] We use issuer rating as of the fiscal year-end prior to the loan origination, not ratings for individual loans, because information on ratings for individual loans is more often missing. Therefore, the sample includes 1,100 loan facilities (out of the total 20,031) made to investment

Table 3
Differences in attributes of non-bank facilities and bank-only facilities.

This table shows the differences in various attributes between non-bank leveraged loan facilities and bank-only leveraged loan facilities in our sample. A non-bank facility is a facility for which there is at least one non-bank institution in the syndicate, while a bank-only facility is a facility that is funded solely by bank (commercial or investment) syndicate members. The total number of loan facilities in our sample is 20,031 of which 13,752 are bank-only facilities and 6,279 are non-bank facilities. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of the variables are provided in Appendix A. Panels A, B, C, and D present the differences in the type of facility purchased, issuer credit rating, facility characteristics, and borrowing firm characteristics, respectively. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

	Non-bank facilities (1)		Bank-only facilities (2)		Difference (1)−(2)	
	N	Mean	N	Mean	Diff.	(t-Value)
Panel A: Facility type						
% Revolver	6,279	49.3	13,752	67.8	−18.5	(−25.36)***
% Term loan A	6,279	7.3	13,752	3.6	3.7	(11.56)***
% Term loan B	6,279	43.3	13,752	28.6	14.7	(20.73)***
Panel B: S&P issuer credit rating						
% Having rating	6,279	52.6	13,752	34.8	17.7	(24.06)***
Conditional on having an issuer credit rating						
% BBB and above	3,301	5.1	4,792	19.4	−14.3	(−18.79)***
% BB	3,301	38.9	4,792	44.6	−5.7	(−5.07)***
% B and below	3,301	56.0	4,792	36.0	19.9	(18.08)***
Panel C: Facility characteristics						
Facility amount ($M)	6,279	186.0	13,752	145.0	41.0	(10.81)***
Number of participating lenders	6,279	8.882	13,752	4.844	4.038	(37.84)***
Relationship score	6,279	0.088	13,752	0.068	0.020	(15.42)***
Maturity (months)	6,279	54.40	13,752	43.43	10.97	(30.91)***
Secured indicator	6,279	0.791	13,752	0.659	0.131	(18.99)***
Performance pricing indicator	6,279	0.405	13,752	0.440	−0.035	(−4.60)***
Covenants indicator	6,279	0.753	13,752	0.757	−0.004	(−0.63)
Sole-lender facility indicator	6,279	0.056	13,752	0.156	−0.100	(20.03)***
Panel D: Borrowing firm characteristics						
Total assets ($M)	5,519	1,975.9	12,910	1,602.2	373.8	(5.48)***
Fixed assets/Total Assets	5,437	0.319	12,678	0.320	0.000	(−0.11)
Z-score	4,032	2.182	10,144	3.546	−1.363	(−19.95)***
Leverage	4,957	0.781	11,979	0.610	0.171	(26.73)***
Industry-adjusted ROA	5,428	−0.110	12,739	−0.074	−0.036	(−10.34)***
Number of analysts following	6,279	3.289	13,752	3.870	−0.581	(−8.03)***
Institutional holdings	6,279	0.290	13,752	0.332	−0.042	(−8.42)***

facilities with issuer ratings, 56% have a B credit rating or lower, compared to 36% of the bank-only loan facilities. In addition, borrowers of non-bank facilities have higher leverage, lower Z-scores, and lower return on assets (ROA) than bank-only facilities.[11]

3.2. Differences in spreads

The goal of this paper is to understand why we observe investors with different required returns investing in the same syndicated loan facilities. Within a particular facility, all investors receive the same return; however, facilities differ cross-sectionally, both in terms of the syndicate composition and the spreads that they offer investors. To attract investors with higher required rates of return,

lead arrangers of the facilities must offer higher spreads. Therefore, we expect to observe higher spreads for loan facilities with non-bank syndicate members than for loan facilities with bank-only participants.

There are a number of reasons why banks could not be able to fill the entire loan facility by themselves. First, banks face regulatory lending restrictions aimed to reduce banks' portfolio credit risk. For example, banks are required to set aside more capital for riskier loans. Moreover, lending limit regulations restrict the total amount of loans and credits that a bank can extend to a single borrower (usually no more than 15% of the bank's total capital). Second, in addition to regulatory lending limits, banks have internal lending limits that are often even lower than the regulatory limits.[12] Third, bank credit supply also is highly cyclical. Bank-loan supply will tend to be low at times when there are tight lending standards, high levels of nonperforming loans, and tight monetary

---

[11] "Z-score" is intended to be a negative function of bankruptcy probabilities. It is taken from Altman (1968) and defined by: $Z = 1.2 \times$ Working Capital/Total Assets $+ 1.4 \times$ Retained Earnings/Total Assets $+ 3.3 \times$ Earnings Before Interest and Taxes (EBIT)/Total Assets $+ 0.6 \times$ Market Value of Equity/Book Value of Total Liabilities $+ 0.999 \times$ Sales/Total Assets.

[12] For example, Ivashina (2009) measures the internal lending limit within the DealScan sample as a median dollar size of the lead bank's loan share calculated over the year previous to the date of the analysis. She finds the average lending limit is only $35 million, much smaller than the regulatory limit.

policy, which are possibly the times when firms need capital most.

To evaluate the hypothesis that loan facilities with non-bank participation have higher spreads than bank-only facilities empirically, we estimate equations predicting the interest rate on a particular loan facility. Because the loans in our sample are floating rate with LIBOR as their index, we estimate equations predicting the "All-in-drawn spread," which is the spread of the loan facility over LIBOR plus any annual fees that the borrower must pay the lenders. Our goal is to estimate the incremental effect of a non-bank institutional investor on the spread, holding other factors that could affect the spread constant. There-fore, we estimate the following equation:

$$\text{All-in-drawn spread} = \alpha + \beta \times \text{Non-bank syndicate member} + \gamma \times X + \varepsilon,$$
$$(1)$$

where X is a vector of covariates that includes facility- and firm-specific control variables. The control variables include the facility amount, the number of participating lenders and the lead lenders' past relationships with the syndicate members, the maturity of the facility, whether the facility is secured or having a performance-pricing feature, whether the loan has covenants, whether the loan is distributed to a syndicate of lenders or funded by a sole-lender, as well as the borrowing firm's size, ratio of fixed to total assets, Z-score, leverage, industry-adjusted ROA, log of the number of analyst following the firm, total institu-tional holdings, and an indicator for no credit rating. We also control for the high-yield spread in the month of facility origination to take into account time-series varia-tions in market-wide risk premiums. Definitions of all variables are provided in Appendix A.

The loan facilities are generally either revolvers or term loans. The term loan facilities are of two types, term loan A facilities or term loan B facilities (sometimes labeled just "term loan" in the DealScan database). Term loan B facilities generally have higher spreads than term loan A facilities, which is consistent with the amortizing nature of term loan A facilities leading to a shorter effective maturity than term loan B facilities. For this reason, it is important to control for differences in type of facility when estimat-ing Eq. (1).

A key factor in determining the spread on a loan facility is its default risk. It is possible that differences in spreads between non-bank and bank-only facilities could reflect the fact that non-bank facilities tend to be for riskier borrowers (see Table 3). To measure the incremental impact of a non-bank institutional investor on spreads, it is important to control as well as possible for the default risk of the facility.

About 40% of the firms in our sample have credit ratings at the end of fiscal year prior to the loan origina-tion. The credit ratings presumably reflect the risk of the issuer as assessed by professionals around the time the loan is issued. However, relying solely on credit ratings to measure risk necessitates dropping loan facilities made to firms that do not have credit ratings. Therefore, we estimate specifications using issuer credit ratings as a measure of risk for the loan facilities for which credit ratings are available, as well as equations using the Z-score

and leverage to control for default risk for the larger sample that includes loan facilities without credit ratings.

We present the Ordinary Least Squares (OLS) regression coefficient estimates of Eq. (1) and the corresponding *p*-values on the full sample in Panel A of Table 4, and on the subsample with firm credit ratings in Panel B of Table 4. Each equation includes facility-purpose fixed effects, industry fixed effects, and year fixed effects, and the reported standard errors are double-clustered by borrowing firm and year. When we consider the sample of all facility types, we include facility-type fixed effects in the equation as well.

Column 1 of Panel A of Table 4 presents estimates of Eq. (1) using all observations for which all required data are available (12,346 loan facilities). In this column, the coefficient on the non-bank syndicate member indicator variable is 53.9, and is statistically significantly different from zero. This coefficient indicates that holding all other things constant, loan facilities with at least one non-bank syndicate member have spreads that are 53.9 basis points higher than those of bank-only loan facilities. This spread difference is relatively large, given the average spread of 249 basis points, so the estimated non-bank premium equals 21.6% of the total spread.[13] In terms of dollars, the non-bank premium of 53.93 basis points translates into an annual premium of $857,487 for the average size facility of $159 million.

It is possible that the non-bank indicator variable proxies for the effect of a relationship or lack of relation-ship between the lead arranger and various loan syndicate members. To evaluate this possibility, we create a "Rela-tionship score" variable, equal to the average fraction of facilities done by a lead lender that includes a syndicate member in the current loan during the prior three years. The coefficient on this variable is negative after controlling for the existence of a non-bank syndicate member.[14] This negative coefficient is consistent with the notion that prior relationships between lenders are associated with lower spreads.

The coefficients on the other variables, which control for other factors that potentially affect spreads, are con-sistent with the notion that spreads are a function of borrower and loan risk. Larger loan facilities with more syndicate members tend to be less risky and therefore have lower spreads. Secured facilities tend to be more risky, and hence have higher spreads.[15] Facilities with performance-related pricing provisions (i.e., the spread is adjustable if performance improves based on pre-defined

---

[13] The average spread for the 12,346 facilities that have all required data and therefore used in the regression is 249 basis points (see Appendix B).

[14] In an alternative way to measure the existence and intensity of relationship, we also use an indicator variable that takes a value of one if the relationship score is above median (4.2%), and zero otherwise. This indicator variable is also significantly negatively related to the all-in-drawn spread, and using this alternative relationship measure does not affect our main results.

[15] Security by itself lowers the risk of a loan. However, secured loans tend to be issued by younger, riskier firms with lower cash flows, so the positive relation with spreads likely reflects this additional risk. See Berger and Udell (1990) and Erel, Julio, Kim, and Weisbach (2012).

Table 4

Do leveraged loan facilities with non-bank syndicate members have higher or lower spreads?

This table presents the OLS regression coefficient estimates of Eq. (1) and corresponding p-values. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of all variables are provided in Appendix A. The dependent variable is the all-in-drawn loan spread over LIBOR in basis points, and the analysis is conducted at the loan facility level. Panel A reports the results for regressions estimated by type of facility. Panel B reports the results for regressions estimated by credit rating groups for the subsample of firms with S&P issuer credit ratings. The number of loan facilities for which all required data are not missing is 12,346. All specifications include facility-purpose fixed effects, industry fixed effects, and year fixed effects. All specifications that consider the full sample of all facility types (i.e., all columns except columns 2–4 of Panel A) additionally include facility-type fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: By facility type

Sample	All facility types (1)		Revolvers (2)		All term loan facilities (3)		Term loan B facilities (4)	
Dependent var.=All-in-drawn spread	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)
Non-bank syndicate member	53.93***	(0.00)	44.93***	(0.00)	68.90***	(0.00)	74.49***	(0.00)
Log (facility amount)	−11.81***	(0.00)	−19.06***	(0.00)	−1.88	(0.34)	−3.34	(0.13)
Log (number of participating lenders)	−10.15***	(0.01)	−1.38	(0.69)	−22.07***	(0.00)	−22.96***	(0.00)
Relationship score	−43.59*	(0.05)	−56.95***	(0.01)	−33.25	(0.27)	−41.84	(0.18)
Log (maturity)	−10.98***	(0.00)	−6.93***	(0.01)	−18.55**	(0.02)	−17.26**	(0.03)
Secured indicator	45.35***	(0.00)	44.88***	(0.00)	49.18***	(0.00)	48.19***	(0.00)
Performance pricing indicator	−41.32***	(0.00)	−31.13***	(0.00)	−54.93***	(0.00)	−55.22***	(0.00)
Covenants indicator	4.37	(0.27)	0.36	(0.93)	1.86	(0.82)	3.09	(0.69)
Sole-lender facility indicator	1.70	(0.78)	1.75	(0.72)	−4.41	(0.60)	−2.51	(0.79)
Log (total assets)	−1.02	(0.72)	−1.63	(0.52)	−0.62	(0.84)	0.26	(0.93)
Fixed assets/Total Assets	0.54	(0.96)	−3.35	(0.63)	7.16	(0.72)	3.63	(0.86)
Z-score	−2.17***	(0.00)	−2.26***	(0.00)	−1.93	(0.11)	−2.22*	(0.09)
Leverage	33.15***	(0.00)	33.33***	(0.00)	28.96**	(0.02)	29.71**	(0.02)
Industry-adjusted ROA	−70.63***	(0.00)	−68.19***	(0.00)	−74.14***	(0.00)	−71.50***	(0.00)
Log (number of analyst following)	−7.97***	(0.00)	−6.42***	(0.01)	−9.59**	(0.01)	−7.80*	(0.07)
Institutional holdings	−12.42**	(0.04)	−14.79***	(0.00)	−11.56	(0.26)	−9.40	(0.38)
Unrated	−0.29	(0.96)	−5.21	(0.23)	11.03	(0.21)	12.25	(0.19)
High-yield spread	0.09***	(0.00)	0.06**	(0.02)	0.15***	(0.00)	0.16***	(0.00)
Term loan A					−6.43	(0.33)		
Fixed effects								
Loan purpose	Yes		Yes		Yes		Yes	
Facility type	Yes		No		No		No	
Industry	Yes		Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes		Yes	
Number of observations	12,346		8,065		4,281		3,752	
Adjusted R^2	0.435		0.471		0.354		0.345	

Table 4 (*continued*)

Panel B: By issuer credit rating

Sample Dependent var. = All-in-drawn spread	All with issuer ratings (1)		BBB-rated and above (2)		BB-rated (3)		B-rated and below (4)		No issuer rating (5)	
	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)
Non-bank syndicate member	22.23***	(0.00)	28.59***	(0.01)	20.77***	(0.00)	21.06***	(0.00)	75.96***	(0.00)
Log (Facility amount)	−15.25***	(0.00)	−4.85	(0.27)	−12.09***	(0.00)	−19.15***	(0.00)	−8.54***	(0.00)
Log (number of participating lenders)	−11.33***	(0.00)	−13.72***	(0.00)	−11.99***	(0.00)	−9.99*	(0.09)	−2.25	(0.64)
Relationship score	−13.07	(0.45)	−6.48	(0.88)	−2.93	(0.89)	−24.93	(0.44)	−118.87***	(0.00)
Log (maturity)	−6.54	(0.17)	2.57	(0.62)	7.43**	(0.01)	−25.72***	(0.00)	−15.30***	(0.00)
Secured indicator	40.39***	(0.00)	52.73***	(0.00)	39.90***	(0.00)	33.98***	(0.00)	38.26***	(0.00)
Performance pricing indicator	−40.36***	(0.00)	−32.43***	(0.00)	−23.47***	(0.00)	−52.47***	(0.00)	−39.63***	(0.00)
Covenants indicator	17.97***	(0.00)	9.63	(0.52)	8.03	(0.34)	28.01**	(0.04)	−0.40	(0.94)
Sole-lender facility indicator	−46.84***	(0.00)	−46.63	(0.14)	−33.30	(0.13)	−55.09***	(0.00)	9.74*	(0.06)
Log (total assets)	7.05***	(0.01)	11.97***	(0.00)	4.32	(0.17)	7.71**	(0.04)	−6.38*	(0.07)
Fixed assets/Total Assets	21.72***	(0.00)	11.56	(0.56)	−10.51	(0.26)	41.52***	(0.00)	−11.11	(0.40)
Z-score									−2.44***	(0.00)
Leverage	19.06***	(0.01)	−0.69	(0.96)	15.64**	(0.02)	19.21*	(0.07)	28.36***	(0.00)
Industry-adjusted ROA	−64.15***	(0.00)	−8.16	(0.90)	−128.68***	(0.00)	−41.79	(0.16)	−63.92***	(0.00)
Log (number of analyst following)	−5.64**	(0.03)	−7.70	(0.17)	−8.94***	(0.00)	−3.32	(0.32)	−6.98**	(0.04)
Institutional holdings	−10.09**	(0.03)	−0.84	(0.97)	−11.95**	(0.02)	−15.05**	(0.04)	−7.20	(0.51)
High-yield spread	0.17***	(0.00)	0.10*	(0.08)	0.19***	(0.00)	0.19***	(0.00)	0.04**	(0.04)
BB-rated	25.79***	(0.00)								
B-rated and below	79.51***	(0.00)								
Fixed effects										
Loan purpose	Yes		Yes		Yes		Yes		Yes	
Tranche type	Yes		Yes		Yes		Yes		Yes	
Industry	Yes		Yes		Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes		Yes		Yes	
Number of observations	6,879		926		2,984		2,969		7,091	
Adjusted R^2	0.500		0.378		0.481		0.360		0.433	

performance metrics) tend to have lower spreads. A firm's Z-score has a negative coefficient and leverage a positive one, suggesting that riskier firms have loan facilities with higher spreads, and a firm's profitability in the form of industry-adjusted ROA, not surprisingly, is associated with lower spreads. We also control for market-wide risk premium by including the high-yield credit spread, measured as the difference between the average spread on AAA-rated loan index and the average spread on BB-rated loan index in the month of loan origination. Not surprisingly, since our sample is relatively risky leveraged loans, the high-yield spread is positively and statistically significantly related to the all-in-drawn spread.

In column 2 of Panel A of Table 4, we present estimates of Eq. (1) for the subsample of revolvers, in column 3 for all term loan facilities, and in column 4 for only the term loan B facilities. In each column, the coefficient on the non-bank syndicate member indicator variable is positive and statistically significantly different from zero. For revolvers, this coefficient implies that loan facilities having non-bank syndicate members have 44.9 basis-point higher spreads than bank-only loan facilities. For all term loans pooled together (column 3), the premium is 68.9 basis points, and for just term loan B facilities (column 4), it is 74.5 basis points. These results imply that there is a positive premium associated with different types of non-bank loan facilities.

In these equations, we control for default risk using the borrowing firm's accounting-based measures such as leverage and the firm's Z-score. An alternative way of controlling for risk is to use the firm's credit rating. Since credit ratings are constructed by professionals to measure firms' comprehensive default risk, it is likely a preferable approach. However, credit ratings are not available for all firms, so the use of credit ratings is limited to those firms that have them.

Panel B of Table 4 presents coefficient estimates of Eq. (1) for different credit ratings (columns 1 through 4) and for issuers with no credit ratings (column 5). Column 1 contains coefficients for all facilities from issuers with credit ratings, including indicator variables for different credit rating categories. Columns 2, 3, and 4 present coefficients for BBB- and above rated firms, BB-rated firms, and B-rated and below firms, respectively. As in Panel A, we include control variables for facility and firm characteristics and facility-type, facility-purpose, industry, and year fixed effects. The reported standard error estimates are double-clustered by borrowing firm and year.

In each column in Panel B of Table 4, the coefficient on the non-bank syndicate member indicator variable is positive and statistically significantly different from zero. For all firms with credit ratings (column 1), the coefficients indicate that there is about a 22.2 basis-point premium for facilities with non-bank participation. This premium equals 28.6 basis points for firms rated BBB and higher, 20.8 basis points for BB-rated firms, and 21.1 basis points for B-rated and below firms. In addition, for firms without ratings, there is an estimated non-bank premium of 76.0 basis points.

As discussed in footnote 2, we follow DealScan's definition of leveraged loans, which includes all unrated loans with spreads over LIBOR of 125 basis points or more. Because 60% of our sample loans are unrated, we re-

estimate Panel A of Table 4 and column 5 of Panel B of Table 4, restricting our sample to unrated loans with spreads over LIBOR of 150 basis points or more (Thomson Financial's definition) as a robustness check of our results. Using this restricted sample of loans, we find qualitatively similar results to those reported in Table 4.[16]

3.3. Non-bank premiums and borrower financial constraints

One interpretation of the non-bank premium is that the non-bank institutions are providing capital when banks have difficulty filling the syndicate, which is likely to occur when borrowing firms are facing financial constraints. To examine this hypothesis, Table 5 presents estimates of the equation from column 1 of Panel A of Table 4, with the non-bank syndicate member variable interacted with different measures of the financial constraints facing the borrowing firm. In particular, we include an indicator variable equal to one if the firm is unrated, the fraction of the firm's debt that is due within a year, an indicator variable equal to one if the firm's proportion of current debt due within a year is in the 75th percentile or higher, indicator variables equal to one if the firm has ever issued a public bond or has issued one in the previous year, and the "size-age" index of Hadlock and Pierce (2010).[17]

The coefficients in Table 5 indicate that using each measure, the more constrained the firm appears to be, the higher is the non-bank premium. Not surprisingly given the results from Panel B of Table 4, unrated firms have higher non-bank premiums than rated firms. Firms with a higher proportion of debt due within the next year have higher non-bank premiums, which is consistent with the notion that the premiums reflect the immediacy of the demand for capital. Firms that have access to public bond markets have lower non-bank premiums, with the premium equaling essentially zero if the firm has issued a public bond in the last year. Finally, firms identified as likely to be constrained using the size-age index of Hadlock and Pierce (2010) have higher non-bank premiums. Overall, the results in Table 5 are consistent with the proposition that the premiums to non-bank syndicate members reflect a return to these institutions which are providing capital when it is unavailable from other sources.

One potential concern is that our measures of constraints reflect the borrowing firm's underlying risk rather than access to capital. Because of this concern, we include into each equation each measure of financial constraint by itself in addition to it being interacted with the non-bank syndicate indicator variable. The coefficients on the individual measures of financial constraints, which reflect the

---

[16] These estimates are not reported but are available from the authors upon request.

[17] The size-age index is calculated as $(-0.737 \times \text{Size}) + (0.043 \times \text{Size}^2) - (0.040 \times \text{Age})$, where Size is the natural log of inflation-adjusted total assets (2004 dollars), and Age is the number of years the firm is listed with a non-missing stock price on Compustat. In calculating the index, Size is capped at the log of \$4.5 billion, and Age is capped at 37 years.

Table 5

Is the non-bank premium higher when the borrowing firm is more financially constrained?

This table presents the OLS regression coefficient estimates of the equation from column 1 of Panel A of Table 4, with the non-bank syndicate variable interacted with different measures of the borrower financial constraints. *p*-Values are presented in parentheses. *Unrated* is an indicator variable equal to one if the firm is unrated by S&P. *Current debt due* is the amount of the firm's debt that is due within a year divided by its total long-term debt. *Hi-current debt due* is an indicator variable equal to one if the firm's proportion of current debt due is in the 75th percentile (about 31%) or higher. *Issued public bond-ever* and *Issued public bond-prior year* are indicator variables equal to one if the firm has ever issued a public bond and if the firm has issued one in the previous year, respectively. *SA-index* is the "size-age" index of Hadlock and Pierce (2010). The sample is leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Data to construct all measures of financial constraints, except the issuance of public bonds, are from Compustat. Data on the issuance of public bonds are from the SDC Platinum database. Definitions of all other variables are provided in Appendix A. Coefficient estimates on other facility- and firm-level control variables are omitted for brevity. The dependent variable is the all-in-drawn loan spread over LIBOR in basis points, and the analysis is conducted at the loan facility level. All specifications include facility-type fixed effects, facility-purpose fixed effects, industry fixed effects, and year fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent var.=All-in-drawn spread	(1)		(2)		(3)		(4)		(5)		(6)	
	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)	Coefficient	(p-Val)
Non-bank syndicate member*Unrated	47.20***	(0.00)										
Unrated	−15.98***	(0.00)	−1.38	(0.82)	−1.24	(0.83)	0.52	(0.93)	−0.30	(0.96)	−0.79	(0.89)
Non-bank syndicate member*Current debt due			25.34**	(0.05)								
Current debt due			2.25	(0.66)								
Non-bank syndicate member *Hi-current debt due					21.88***	(0.00)						
Hi-current debt due					0.64	(0.85)						
Non-bank syndicate member*Issued public bond-ever							−28.58***	(0.00)				
Issued public bond-ever							9.18*	(0.06)				
Non-bank syndicate member*Issued public bond-prior year									−50.23***	(0.00)		
Issued public bond-prior year									12.01	(0.11)		
Non-bank syndicate member*SA-index											20.85***	(0.00)
SA-index											1.52	(0.64)
Non-bank syndicate member	31.00***	(0.00)	48.29***	(0.00)	48.66***	(0.00)	60.38***	(0.00)	55.20***	(0.00)	123.52***	(0.00)
Other controls	Yes		Yes		Yes		Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes		Yes		Yes		Yes	
Loan purpose	Yes		Yes		Yes		Yes		Yes		Yes	
Facility type	Yes		Yes		Yes		Yes		Yes		Yes	
Industry	Yes		Yes		Yes		Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	12,346		12,346		12,346		12,346		12,346		12,272	
Adjusted R^2	0.442		0.436		0.437		0.437		0.436		0.438	

effect of these measures when there is not a non-bank syndicate member, are generally substantially smaller than the coefficients on the measures interacted with the non-bank syndicate member variable. If the variables we use to measure financial constraints are related to facilities spreads because financial constraint measures are correlated with the firm's risk, we would expect them to be related to spreads regardless of the composition of the syndicate. Consequently, the interaction term of the measure of financial constraints with the non-bank indicator variable likely reflects the immediacy of the borrowing firm's demand for capital rather than its fundamental risk.

3.4. Intertemporal variation in non-bank premiums

If non-bank premiums reflect a return to providing capital at times when banks cannot, then the premiums should vary depending on the supply of bank capital available at a particular point in time. Factors that could affect the supply of bank capital include the demand for loans from collateralized loan obligations (CLOs), the risk aversion of banks, as well as the overall state of the economy. To evaluate the extent to which non-bank premiums vary over time, we estimate the equation presented in column 1 of Panel A of Table 4 separately for each year in our sample.

We summarize the equations estimating the non-bank premium by year in Panel A of Table 6. Each row of this panel presents the coefficient on the non-bank syndicate member variable, the number of observations in that year, and the adjusted R^2, omitting the other variables in the equation for brevity. The coefficient on the indicator variable denoting whether there is a non-bank syndicate member is positive and statistically significant in each annual equation, implying that there is a non-bank premium in each year of the sample. However, as shown in Panel A of Table 6, there is substantial intertemporal variation in non-bank premiums, with the premium ranging from 34.9 basis points in 2005 to 68.9 basis points in 1997.

Table 6
Does risk aversion and liquidity of the bank affect the size of the non-bank premium?

The dependent variable is the all-in-drawn loan spread over LIBOR in basis points, and the analysis is conducted at the loan facility level. In Panel A, the equation presented in column 1 of Panel A of Table 4 is estimated separately for each year in our sample. Each row of Panel A presents the OLS regression coefficient estimates on *Non-bank syndicate member* and corresponding p-values, the number of observations in each regression, the adjusted R^2, and the average high-yield spread for that year, omitting the other variables in the equation for brevity. In the last row of Panel A, we re-estimate the specification from column 1 of Table 4, Panel A, including a term interacting the high-yield spread with the non-bank indicator variable using the full sample. In Panel B, the equation presented in column 1 of Panel A of Table 4 is augmented to include interactions of *Non-bank syndicate member* and measures of the liquidity of lead bank. Column 1 of Panel B includes an indicator variable measuring whether the lead bank is a securitization-active bank. The list of securitization-active banks is from Nadauld and Weisbach (2012). Column 2 includes a variable measuring the lead bank's level of cash holdings, normalized by total assets. Data to construct this measure are from the Compustat annual database. Column 3 includes the lead bank's risk-adjusted Tier-1 capital ratio, which is calculated according to the Basel Accord and taken from the Compustat Bank database. In columns 2 and 3 we only consider the subsample of facilities that are arranged by the top-100 lead arrangers. The number of observations used in column 3 further drops, because Tier-1 capital ratios are not available from the Compustat Bank database for non-bank or foreign bank lead arrangers. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of all other variables are provided in Appendix A. All specifications include facility-type fixed effects, facility-purpose fixed effects, industry fixed effects, and year fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Intertemporal variation in non-bank premiums

Year	Non-bank syndicate member		Non-bank syndicate member × High-yield spread		Number of observations	Adjusted R^2	High-yield spread: Avg of monthly (BB-AAA) spreads
1997	68.93***	(0.00)			1,740	0.568	130.6
1998	47.10***	(0.00)			1,405	0.531	181.0
1999	47.12***	(0.00)			1,212	0.432	218.9
2000	40.11***	(0.00)			1,141	0.450	294.3
2001	54.68***	(0.00)			1,191	0.437	350.8
2002	63.78***	(0.00)			1,138	0.418	452.0
2003	61.01***	(0.00)			1,081	0.419	331.4
2004	62.17***	(0.00)			1,042	0.413	172.8
2005	34.89***	(0.00)			910	0.478	186.7
2006	44.91***	(0.00)			792	0.430	185.9
2007	56.76***	(0.00)			694	0.481	192.8
1997–2007	30.36***	(0.00)	0.10***	(0.00)	12,346	0.437	239.2

Panel B: Lead bank's liquidity and the non-bank premium

Dependent var.=All-in-drawn spread	(1)		(2)		(3)	
	Coef.	(p-Val)	Coef.	(p-Val)	Coef.	(p-Val)
Non-bank syndicate member*Securitization-active lead	−40.85***	(0.00)				
Securitization-active lead	15.77***	(0.00)				
Non-bank syndicate member*Lead's cash/Total assets			−176.46***	(0.01)		
Lead's cash/Total Assets			151.87***	(0.00)		
Non-bank syndicate member*Lead's Tier-1 capital ratio					2.06	(0.48)
Lead's Tier-1 capital ratio					3.94***	(0.00)
Non-bank syndicate member	66.57***	(0.00)	64.32***	(0.00)	22.07	(0.36)
Other controls	Yes		Yes		Yes	
Fixed effects	Yes		Yes		Yes	
Loan purpose	Yes		Yes		Yes	
Facility type	Yes		Yes		Yes	
Industry	Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes	
Number of observations	12,346		9,728		8,508	
Adjusted R^2	0.439		0.441		0.442	

To the extent that these non-bank premiums reflect bank risk preferences, they are likely to be correlated with the high-yield credit spread, since that spread measures the compensation the market is providing for holding riskier securities. Panel A of Table 6 also presents the high-yield spread for each year, calculated as the average of the monthly (BB-AAA) spreads on corporate bonds, and Fig. 1 graphs the estimated non-bank premiums and high-yield spreads over time. This figure clearly indicates that the two series are highly positively correlated.

To test formally whether non-bank premiums are related to the high-yield spread, we re-estimate the specification from column 1 of Table 4, Panel A, including an interaction term between the high-yield spread and the non-bank indicator variable. We present the coefficient of this interaction variable in this specification in the last row of Panel A of Table 6. As suggested by Fig. 1, the coefficient on the non-bank indicator variable interacted with the high-yield spread is positive and significantly different from zero even after controlling for the high-yield spread and the presence of a non-bank syndicate
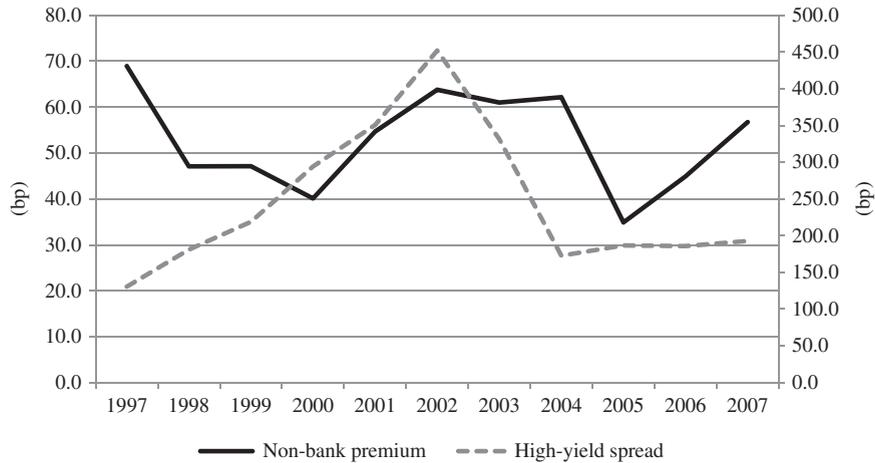
Fig. 1. Intertemporal variation in the non-bank premium and high-yield spread. This figure presents the non-bank premium (solid line, left axis) and high-yield spread (dashed line, right axis) over time, both in basis points. Non-bank premiums are the coefficient estimates reported in Panel A of Table 6. High-yield spread is the difference between Bank of America Merrill Lynch US Corporate High Yield BB Option-Adjusted Spread and Bank of America Merrill Lynch US Corporate AAA Option-Adjusted Spread, measured in the month of loan issuance. Data on high-yield spread are obtained from the Federal Reserve Bank.

member separately. This positive coefficient implies that non-bank institutions earn a higher return for providing capital at times when it is most costly for banks to supply.

3.5. Lead bank liquidity

Another implication of the view that the non-bank premiums reflect the provision of liquidity by the non-bank institutions is that the premiums should be higher when the lead bank in the syndicate has limited liquidity itself. To measure liquidity of the lead bank, we rely on three alternative measures: First, using the classification in Nadauld and Weisbach (2012), we create an indicator variable denoting the ten banks labeled "securitization-active" for arranging CLOs.[18] Since these ten banks arranged a large fraction of the CLOs [78% in the Nadauld and Weisbach (2012) sample], and CLOs were a large purchaser of leveraged loans during our sample period, these banks were less likely to be short of capital or subject to the risk violating any regulatory or internal limits to holding risky loans than other banks when arranging a syndicated loan. Second, we use the lead arranger's cash to total assets ratio, which presumably reflects its ability to provide capital. Finally, we use the lead arranger's Tier-1 capital ratio, which also is likely to be correlated with a bank's ability to provide capital, especially to risky firms or facilities.

Panel B of Table 6 provides estimates of the equation predicting spreads using each of these variables interacted with the non-bank syndicate member indicator variable. For the "securitization-active" lead arranger and the lead arranger's cash to asset ratio, the coefficient on the inter-action term is negative and significantly different from zero. The coefficient on the interaction term for the lead

arranger's Tier-1 capital ratio, however, is small and not significantly different from zero. One possible reason why the Tier-1 capital ratio is not significant is that all lead banks in our sample have Tier-1 capital ratios above the regulatory minimum of 4%. Nonetheless, the fact that the non-bank premium is higher with two of the three measures of lead arranger liquidity is consistent with the notion that the premiums reflect the return to these institutions for providing capital when banks are limited in their ability to do so. When the lead arranger is less liquid, he is more likely to have to pay a premium spread to attract non-bank investors.

3.6. Within-loan estimates

One clear pattern emerging from Table 4 is that the estimates of the non-bank premium are substantially smaller when credit ratings are used to control for risk (Panel B, columns 1–4) than when we use accounting variable-based risk measures (Panel A), or for the subsample of firms without ratings (Panel B, column 5). This observation suggests that the estimated non-bank premium could reflect borrower risk. Credit ratings are themselves imperfect measures of default risk, since there is variation in risk within credit rating classes and errors in assigning ratings to firms. Potentially, the positive estimated premium for non-bank participation could reflect residual risk not reflected in ratings rather than a premium to attract non-bank institutional lenders.

A method of measuring non-bank syndicate member premiums that is unlikely to be affected by risk or other potential unobserved firm-level heterogeneity comes from the relative pricing of different facilities within the same loan.[19] Since each facility of a multiple facility loan has the same seniority and covenants, the default risk of facilities and the creditor rights attached to the facilities in the

---

[18] By this classification, the following banks are considered "securitization-active": J.P. Morgan, Citigroup, Bear Stearns, Credit Suisse, Lehman Brothers, Deutsche Bank, Goldman Sachs, Morgan Stanley, Wachovia, and Merrill Lynch.

[19] This approach was developed by Ivashina and Sun (2011) and was recently adopted by Nadauld and Weisbach (2012).

Table 7

Is the non-bank premium driven by unobservable heterogeneity across firms?

Panel A presents the OLS regression coefficient estimates of Eq. (2) and corresponding *p*-values on the sample of leveraged loans that have multiple facilities. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of all variables are provided in Appendix A. The dependent variable is the *spread gap* between the all-in-drawn spreads of different facilities *within* the same loan in basis points. The indicator variable denoting the non-bank presence measures the incremental effect on spread gap of the non-bank institution participating in the syndicate of the loan facility, and the control variables are intended to capture other differences between the facilities. Column 1 of Panel A presents estimates for the subsample of 391 facility pairs that have both term loan A and term loan B facilities, and columns 3 present estimates for the subsample of 2,339 facility pairs that have both a term loan B facility and a revolver. The number of observations drops in columns 2 and 4, because we include firm-level control variables. Panel B presents the OLS regression coefficient estimates of Eq. (1) and corresponding *p*-values on the sample of non-bank loan facilities and the matched bank-only loan facilities of the same facility type. Column 1 and 2 employ 106 loans (207 facilities) that have both a non-bank facility and a bank-only facility of the same facility type *within* the same loan. Column 3 and 4 consider 420 non-bank loan facilities and 421 matched bank-only loan facilities of the same facility type issued by the same borrower in the same year, but not necessarily in the same loan. The number of observations drops in columns 2 and 4, because we include firm-level control variables. All specifications include year fixed effects. All regressions in Panel B additionally include facility-purpose fixed effects and facility-type fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Within-loan spread gap between facilities

Dependent variable	(Term loan B facility – Term loan A facility) spread in the same loan				(Term loan B facility – Revolver) spread in the same loan			
	(1)		(2)		(3)		(4)	
	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)
Non-bank syndicate member in term loan B facility	8.08	(0.36)	9.63	(0.38)	33.24***	(0.00)	42.46***	(0.00)
Differences in log (facility amount)	−6.64	(0.13)	−4.85	(0.31)	−8.69***	(0.00)	−7.21***	(0.00)
Differences in log (number of participating lenders)	4.56	(0.28)	4.55	(0.41)	−9.36**	(0.01)	−6.15	(0.14)
Differences in relationship score	61.37***	(0.01)	27.89	(0.48)	−63.29	(0.40)	−14.71	(0.67)
Differences in log (maturity)	−18.08	(0.21)	−18.13	(0.33)	−0.04	(0.99)	−0.98	(0.77)
Differences in security	−3.63	(0.86)	−50.33	(0.17)	0.93	(0.93)	−7.47	(0.61)
Differences in performance pricing	−5.45	(0.50)	−2.03	(0.84)	−16.39***	(0.00)	−25.26***	(0.00)
High-yield spread	−0.03	(0.38)	−0.12**	(0.03)	0.06	(0.24)	0.03	(0.49)
Firm-level controls	No		Yes		No		Yes	
Fixed effects								
Time (year)	Yes		Yes		Yes		Yes	
Number of observations	391		245		2,339		1,604	
# Non-bank syndicate member in term loan B facility	94		59		213		131	
# Non-bank syndicate member in term loan A facility	18		9		–		–	
# Non-bank syndicate member in revolver	–		–		53		34	
Adjusted R^2	0.057		0.101		0.070		0.093	

Panel B: Differences in spreads between non-bank facilities and matching bank-only facilities

Matching	Same facility type within the same loan				Same facility type to the same borrower in the same calendar year			
Dependent var.: All-in-drawn spread	(1)		(2)		(3)		(4)	
	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)
Non-bank participated	38.77***	(0.00)	25.89*	(0.08)	26.94***	(0.01)	27.04***	(0.01)
Log (facility amount)	−14.39**	(0.03)	−4.53	(0.60)	−18.08***	(0.00)	−11.56*	(0.09)
Log (number of participating lenders)	−19.86***	(0.00)	−13.77	(0.11)	−26.13***	(0.00)	−21.77**	(0.04)
Relationship score	71.40	(0.47)	2.98	(0.97)	−58.39	(0.40)	−119.43	(0.32)
Log (maturity)	28.47**	(0.05)	11.41	(0.42)	−6.66	(0.52)	−2.83	(0.79)
Secured indicator	69.42***	(0.00)	45.24***	(0.00)	57.25***	(0.00)	46.65***	(0.00)
Performance pricing indicator	−46.62***	(0.00)	−38.23***	(0.01)	−69.57***	(0.00)	−77.03***	(0.00)
Covenants indicator	−77.59*	(0.09)	−26.39	(0.35)	18.22	(0.39)	43.51**	(0.05)
Sole-lender indicator	2.04	(0.94)	86.22	(0.11)	−57.54*	(0.10)	13.07	(0.84)
High-yield spread	0.10*	(0.07)	0.08	(0.23)	0.12*	(0.06)	0.11	(0.47)
Firm level controls	No		Yes		No		Yes	
Fixed effects								
Loan purpose	Yes		Yes		Yes		Yes	
Facility type	Yes		Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes		Yes	
Number of observations	207		126		841		496	
# Non-bank participating facilities	106		64		420		243	
Adjusted R^2	0.469		0.650		0.317		0.374	

same loan are essentially the same. Different facilities in the same loan will generally have different maturities and implicit options from one another that will affect their pricing. However, once these other differences are controlled for econometrically, the incremental effect of a non-bank participant on the relative pricing of facilities within a given loan should reflect the impact of non-bank syndicate participation rather than risk differences.

The within-firm approach will not be affected by any form of unobservable firm-level heterogeneity causing a spurious relation between the existence of non-bank institutions in the facility's syndicate and the facility's spread. Any firm-level factor that potentially affects its attractiveness to a lender such as its historical cash flows, future projects, and risks, should affect the spreads on all facilities of the loan similarly. In contrast, a systematic difference in the *relative* spread between different facilities that depends on syndicate composition for a particular facility has to be a function of facility-level rather than firm-level factors. One such possibility would be if different types of facilities have different liquidity and demand. For example, if the lead bank arranger holds the term loan A facility and is worried about being able to sell a particular term loan B facility to other lenders, it can increase the spread, making the facility more attractive to non-bank investors such as hedge funds or finance companies. In this situation, the facilities with non-bank syndicate members are likely to receive unusually high spreads, measured relative to the term loan A facility of the same loan.

To estimate the incremental effect of a non-bank investor on the differences in spreads between facilities of a given loan, we estimate the following equation:

$$\text{Spread gap} = \alpha + \beta \times \text{Facility has non-bank syndicate member} + \gamma \times X + \varepsilon,$$
(2)

where X includes differences in facility-specific characteristics such as facility size, the number of participating lenders, maturity, and whether the facility is secured by collateral, as well as the high-yield spread. The dependent variable in Eq. (2) is the difference between the spreads of different facilities within the same loan. The coefficient on the indicator variable denoting which facility has a non-bank syndicate member measures the incremental effect of a non-bank institution on the spread gap. The control variables are intended to capture other differences between the facilities that could be related to spreads. We estimate Eq. (2) on the sample of loans that have multiple facilities of the type considered in that specification.

Term loan B facilities tend to have a longer effective maturity than term loan A facilities because the vast majority of term loan A facilities are amortizing while term loan B facilities are more often bullet (see Appendix C). With a longer duration, term loan B facilities will have higher spreads regardless of whether there is a non-bank institution participating in the facility. The hypothesis that non-bank investors receive premiums relative to otherwise similar bank-only facilities implies that there should be an additional premium over the corresponding term loan A facility for the term loan B facilities in which non-bank

institutions invest, relative to that of an otherwise similar bank-only term loan B facility.

Column 1 of Panel A of Table 7 presents estimates of Eq. (2) for the subsample of 391 loans that have both term loan A and term loan B facilities.[20] In this subsample, the non-bank investor usually participates in the term loan B portion of the loan: Of the 391 loans, there were 94 in which non-bank institutions were syndicate members in the term loan B facility and only 18 in which the non-bank institutions participated in the term loan A facility. Therefore, we estimate whether the existence of a non-bank syndicate member in the term loan B facility affects the difference in spreads between the two facilities. The coefficients in column 1 indicate the presence of a non-bank investor in the term loan B facility increases the difference in spreads between term loan B and term loan A facilities by 8.1 basis points. However, this estimated difference in spreads is not statistically significantly different from zero at conventional levels. In column 2, we additionally control for differences in firm-level characteristics across loans, which further drops the number of available observations to 245 loans, and obtain similar results.

There are 2,339 loans in our sample that have complete data and contain both a term loan B facility and a revolver.[21] Of these 2,339 cases, it was more common for the non-bank investor to participate in the syndicate of the term loan B portion of the loan than the revolver portion: non-bank institutions participated in the syndicates of 213 term loan B facilities and only 53 of those of the revolvers. For this reason, we estimate Eq. (2) on this subsample of loans, considering the effect of the non-bank institution participating in the syndicate of the term loan B facility in column 3. The dependent variable in these equations is the difference in spreads between the term loan B facility and the revolver. Therefore, the coefficient of 33.2 on the non-bank syndicate member indicator variable in column 3 implies that the spread gap between term loan B facilities and revolvers is 33.2 basis points higher when a non-bank institution is present in the syndicate of the term loan B facility.

A potentially cleaner test of the hypothesis that non-bank institutions receive premiums when investing in syndicated loan facilities comes from cases in which the non-bank invests in one of multiple facilities of the same type in a particular loan. Our sample contains 207 such facilities, in which non-bank institutions invested in 106 facilities. In Panel B of Table 7, we estimate equations similar to Eq. (1) on this sub-sample of loan facilities. In column 1 we present estimates of Eq. (1) without firm-level controls and in column 2, we report coefficients including these controls. In each equation, the coefficient on the non-bank syndicate member indicator variable is positive and statistically significantly different from zero, implying 38.8 and 25.9 basis point premiums to facilities with a non-bank institutional investor.

---

[20] We exclude cases in which non-bank investors are present on both term loan A facilities and term loan B facilities.

[21] Again, we exclude cases in which non-bank investors are present in both a term loan B facility and a revolver.

Table 8

Does the type of non-bank syndicate member affect the pricing of the loan facility?

Panel A of this table presents the OLS regression coefficient estimates of Eq. (1) and corresponding p-values, with the non-bank institutions broken down by the type of institution. The dependent variable is the all-in-drawn loan spread over LIBOR in basis points, and the analysis is conducted at the loan facility level. Column 1 uses the full sample of loan facilities and column 2 uses the subsample of non-bank loan facilities. Panel B presents the OLS regression coefficient estimates of Eq. (2) and corresponding p-values on the sample of loans that have multiple facilities. The dependent variable is the *spread gap* between the all-in-drawn spreads of different facilities *within* the same loan in basis points. The indicator variable indicating the type of non-bank syndicate member's presence measures the incremental effect on spread gap of that type of non-bank institution participating in the syndicate of the loan facility, and the control variables are intended to capture other differences between the facilities. Column 1 presents estimates for the subsample of 401 facility pairs that have both term loan A and term loan B facilities, and column 3 estimates for the subsample of 2,357 facility pairs that have both a term loan B facility and a revolver. The number of observations drops in columns 2 and 4, because we include firm-level control variables. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of all variables are provided in Appendix A. All specifications in this table include year fixed effects. All regressions in Panel A additionally include facility-purpose fixed effects, facility-type fixed effects, and industry fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Estimates using all observations

Sample	All loan facilities (1)		Non-bank facilities (2)	
Dependent var.=All-in-drawn spread	Coef.	(p-Val)	Coef.	(p-Val)
Insurance company syndicate member	−12.85	(0.19)	−8.16	(0.39)
Finance company syndicate member	28.22***	(0.00)	1.47	(0.79)
HF/PE syndicate member	49.38***	(0.00)	31.13***	(0.00)
Mutual fund syndicate member	−10.27	(0.33)	−3.67	(0.73)
Other non-bank institutional syndicate member	35.43***	(0.00)	27.97***	(0.00)
Log (facility amount)	−11.69***	(0.00)	−23.72***	(0.00)
Log (number of participating lenders)	−11.06***	(0.01)	−17.12**	(0.03)
Relationship score	−45.84**	(0.05)	−85.48*	(0.09)
Log (maturity)	−10.09***	(0.00)	−13.74***	(0.01)
Secured indicator	46.27***	(0.00)	34.38***	(0.00)
Performance pricing indicator	−40.03***	(0.00)	−43.08***	(0.00)
Covenants indicator	3.11	(0.41)	9.23	(0.49)
Sole-lender facility indicator	1.43	(0.81)	10.08	(0.52)
Log (total assets)	−1.11	(0.71)	1.11	(0.78)
Fixed assets/Total Assets	−1.78	(0.86)	24.33*	(0.05)
Z-score	−2.24***	(0.00)	−2.40**	(0.02)
Leverage	33.15***	(0.00)	11.99	(0.27)
Industry-adjusted ROA	−71.47***	(0.00)	−55.63***	(0.01)
Log (number of analyst following)	−8.46***	(0.00)	−8.71**	(0.02)
Institutional holdings	−12.11**	(0.02)	−17.97*	(0.06)
Unrated	−2.57	(0.64)	7.72	(0.38)
High-yield spread	0.09***	(0.00)	0.08	(0.14)
Fixed effects				
Loan purpose	Yes		Yes	
Facility type	Yes		Yes	
Industry	Yes		Yes	
Time (year)	Yes		Yes	
Number of observations	12,346		3,460	
Adjusted R^2	0.433		0.445	

Panel B: Within-loan estimates

Dependent variable	(Term loan B facility – Term loan A facility) spread in the same loan				(Term loan B facility - Revolver) spread in the same loan			
	(1)		(2)		(3)		(4)	
Insurance company in term loan B facility	5.88	(0.18)	23.73	(0.13)	−5.57	(0.53)	−4.95	(0.65)
Finance company in term loan B facility	0.59	(0.96)	−6.77	(0.51)	−3.94	(0.69)	−14.70	(0.41)
HF/PE in term loan B facility	9.26	(0.34)	16.87**	(0.03)	53.84***	(0.01)	78.21**	(0.02)
Mutual fund in term loan B facility	−6.02	(0.35)	−15.15	(0.13)	−25.64**	(0.04)	−44.49**	(0.02)
Other non-bank in term loan B facility	−6.54	(0.19)	−2.14	(0.88)	12.97	(0.32)	17.74	(0.28)
Differences in log (facility amount)	−6.48	(0.14)	−3.51	(0.46)	−8.79***	(0.00)	−7.42***	(0.00)
Differences in log (number of participating lenders)	5.25	(0.29)	5.07	(0.41)	−8.71**	(0.01)	−5.16	(0.20)
Differences in relationship score	51.50**	(0.01)	28.17	(0.39)	−65.94	(0.38)	−40.29	(0.34)
Differences in log (maturity)	−17.77	(0.23)	−18.45	(0.32)	0.32	(0.90)	−0.22	(0.94)
Differences in security	−4.13	(0.84)	−52.11	(0.15)	1.44	(0.89)	−8.19	(0.56)
Differences in performance pricing	−5.78	(0.48)	−1.26	(0.90)	−17.85***	(0.00)	−28.12***	(0.00)
High-yield spread	−0.04	(0.38)	−0.14***	(0.01)	0.06	(0.24)	0.02	(0.59)
Firm-level controls	No		Yes		No		Yes	
Fixed effects								
Time (year)	Yes		Yes		Yes		Yes	

Table 8 (*continued*)

Panel B: Within-loan estimates				
Dependent variable	(Term loan B facility – Term loan A facility) spread in the same loan		(Term loan B facility - Revolver) spread in the same loan	
	(1)	(2)	(3)	(4)
Number of observations	401	252	2,357	1,615
# Insurance company in term loan B facility	51	32	87	54
# Finance company in term loan B facility	67	45	141	87
# HF/PE in term loan B facility	83	53	172	110
# Mutual fund in term loan B facility	83	55	151	87
# Other non-bank in term loan B facility	43	30	86	59
Adjusted R^2	0.057	0.112	0.077	0.108

Finally, there are 841 cases in which a borrower issues more than one of the same facility type in the same year, but not necessarily in the same loan. We re-estimate the equation for this subsample in columns 3 and 4 of Panel B of Table 7. In these equations, the estimated non-bank premium is 26.9 and 27.4 basis points, respectively, each of which is statistically significantly different from zero.

Overall, the results from Table 7, in which we compare facilities within a given loan, or across similar facilities from the same borrower within a short period of time, are consistent with the results in Table 4 that are based on comparisons across different facilities. When a non-bank institution participates in a syndicated loan facility, syndicate members receive a premium on the particular facility in which a non-bank institution invests relative to bank-only facilities. These premiums do not appear to be a result of unobserved heterogeneity across firms that is correlated with the firms' risk.

4. Types of non-bank institutional syndicate members and spreads

The within-loan results suggest that the premiums to loan facilities that include non-bank investors in their syndicate occur because of facility-specific and not firm-specific factors. The most plausible explanation for these premiums is that facilities in which non-bank institutions participate are relatively more difficult to market than bank-only facilities. When the arranger can structure a syndicate made up entirely of banks, he can charge the borrower a relatively low spread. However, if banks are not willing to provide the necessary capital, then the arranger will have to charge the borrower a higher spread to attract capital from investors with higher required rates of return (see Panel B of Table 6).

This argument has a clear prediction about the premiums we should observe when different types of non-bank institutional investors are part of the loan facility syndicate. When investors like hedge funds or private equity funds with high required rates of return invest in a loan facility, it means that the facility's arranger had to increase the facility's spread beyond what would have been necessary if only banks were the investors. In

addition, hedge fund and private equity fund managers have unusually high pecuniary incentives, which are likely to motivate them to seek out investments in facilities with unusually high spreads.[22] In contrast, non-bank institutional investors such as insurance companies have required returns similar to banks, and tend to focus on ensuring that their loan portfolio has the right term structure and risk profile, rather than seeking out unusual opportunities to achieve abnormal returns. Therefore, we expect that, controlling for risk, facilities for which hedge and private equity funds are in the syndicate to have higher spreads than those in which insurance companies invest.

4.1. Abnormal spreads across types of non-bank institutional syndicate members

In columns 1 and 2 of Panel A of Table 8, we re-estimate Eq. (1) with the non-bank syndicate members broken down by institutional type. To do so, we include separate indicator variables for insurance companies, finance companies, hedge and private equity funds, mutual funds, and other non-bank investors who could not be classified or are of a type that participated in less than 1% of the full sample for which all required data are available (about 123 facilities). Column 1 presents estimates of this equation using all loan facilities, while column 2 restricts the sample to just those facilities with at least one non-bank syndicate member.

The coefficients indicate that the premiums vary substantially between types of non-bank institutional investor. The largest premiums appear to be for facilities with hedge and private equity fund syndicate members. In column 1, the coefficient on hedge and private equity funds indicator variable is 49.4, which implies that loan

---

[22] General partners of private equity and hedge funds receive direct incentives through carried interest that usually equals 20% of profits. In addition, they receive indirect incentives because their performance affects their future incomes. These indirect incentives are likely to be at least as large in magnitude as the direct incentives. [See Chung, Sensoy, Stern, and Weisbach (2012) for estimates for private equity funds and Lim, Sensoy, and Weisbach (2013) for estimates for hedge funds.]

Table 9
Does non-bank institutional syndicate members' ownership affect the pricing of the loan facility?

    This table presents the OLS regression coefficient estimates of Eq. (1) and corresponding *p*-values. The dependent variable is the all-in-drawn loan spread over LIBOR in basis points, and the analysis is conducted at the loan facility level. In Panel A, Eq. (1) is augmented to include a measure of the non-bank syndicate members' share in the loan facility (columns 1 and 3) and whether a non-bank syndicate member is the largest lender (columns 2 and 4). Columns 1 and 2 use the full sample of loan facilities and columns 3 and 4 use the subsample of non-bank loan facilities. Panel B presents the estimates of Eq. (1), with an indicator variable measuring whether the non-bank syndicate member also owned at least 0.1% of the firm's outstanding equity during the one-year prior to the origination of the loan (*non-bank syndicate member is a dual-holder*) using a subsample of non-bank facilities. Column 1 includes an indicator variable measuring whether any type of non-bank syndicate member is a dual-holder. Column 2 includes indicator variables denoting the type of non-bank institution and whether that type of non-bank institution is a dual-holder. Column 3 includes indicator variables denoting the non-bank syndicate member is the largest lender and also a dual-holder. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007. Definitions of all other variables are provided in Appendix A. All specifications include facility-type fixed effects, facility-purpose fixed effects, industry fixed effects, and year fixed effects. Standard errors are double-clustered by both firm and year. ***, **, and * correspond to statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Non-bank syndicate members' loan shares

Sample	All loan facilities				Non-bank facilities			
	(1)		(2)		(3)		(4)	
Dependent var.=All-in-drawn spread	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)
Non-bank syndicate members' loan facility share	115.65***	(0.00)			122.50***	(0.00)		
Non-bank syndicate member is the largest lender			56.81***	(0.00)			35.29***	(0.00)
Non-bank syndicate member	10.90	(0.28)	36.16***	(0.00)				
High-yield spread	0.12***	(0.00)	0.12***	(0.00)	0.13	(0.20)	0.12	(0.23)
Facility- and firm-level controls	Yes		Yes		Yes		Yes	
Fixed effects								
Loan purpose	Yes		Yes		Yes		Yes	
Facility type	Yes		Yes		Yes		Yes	
Industry	Yes		Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes		Yes	
Number of observations	3,826		3,826		855		855	
Adjusted R^2	0.545		0.535		0.549		0.534	

Panel B: Non-bank syndicate members' equity shares

Sample	Non-bank facilities					
	(1)		(2)		(3)	
Dependent var.=All-in-drawn spread	Coef.	(*p*-Val)	Coef.	(*p*-Val)	Coef.	(*p*-Val)
Non-bank syndicate member is a dual-holder	9.23	(0.27)			19.49	(0.30)
Insurance company syndicate member			−9.70	(0.24)		
Insurance company syndicate member is a dual-holder			3.59	(0.93)		
Finance company syndicate member			1.98	(0.74)		
Finance company syndicate member is a dual-holder			−7.74	(0.38)		
HF/PE syndicate member			30.91***	(0.00)		
HF/PE syndicate member is a dual-holder			29.54*	(0.07)		
MF syndicate member			−4.12	(0.68)		
MF syndicate member is a dual-holder			2.03	(0.80)		
Other non-bank syndicate member			29.70***	(0.00)		
Other non-bank syndicate member is a dual-holder			−48.57**	(0.02)		
Non-bank syndicate member is the largest lender					36.28***	(0.01)
Non-bank syndicate member is the largest lender and a dual-holder					−18.11	(0.57)
High-yield spread	0.08*	(0.10)	0.08	(0.13)	0.12	(0.25)
Facility- and firm-level controls	Yes		Yes		Yes	
Fixed effects						
Loan purpose	Yes		Yes		Yes	
Facility type	Yes		Yes		Yes	
Industry	Yes		Yes		Yes	
Time (year)	Yes		Yes		Yes	
Number of observations	3,460		3,460		855	
Adjusted R^2	0.432		0.445		0.533	

facilities in which hedge and private equity funds invest have an abnormal spread of 49.4 basis points relative to the sample of all facilities. When we restrict the sample to facilities with non-bank syndicate members, the coefficient declines to 31.1, but is still significantly different from zero. The difference between the two coefficients comes from the implied benchmark from the sample used. Since column 2 contains only facilities that have non-bank

syndicate members, the coefficient represents the difference between the spread for a facility with hedge fund or private equity fund participation relative to that for a typical facility with non-bank participation, which is higher than the spread for all-bank facilities.

The other significantly positive premiums occur for facilities with "other" non-bank syndicate members, which potentially include hedge funds that we could not classify, and finance companies. The coefficients on insurance companies and mutual funds are small and not statistically significantly different from zero. These results imply that the spread premium varies across non-bank institutional investor types, and is highest for hedge and private equity funds.

4.2. Within-loan estimates by type of non-bank institutional investor

The spread premium estimates in Panel A of Table 8 control for the risk of the loan using the borrower's financial data. As discussed above, while this approach captures the risk of the facility to some extent, it does so imperfectly, and it is possible that some of the measured premiums to facilities associated with non-bank institutional investors could reflect the fact that these investors tend to invest in loans of riskier firms. To evaluate the extent to which this effect is important, we also estimate spread gap premiums for different types of non-bank institutional investors using the within-loan approach that compares spreads of different facilities of the same loan.

We present the within-loan estimates of the spread gap premiums by type of non-bank institutional investor in Panel B of Table 8. Columns 1 and 2 present estimates of the difference between the spreads on the term loan B and term loan A facilities of the same loan for the loans in our sample that contain both types of facilities, and columns 3 and 4 present comparable estimates for the difference between term loan B facilities and revolvers. The positive and statistically significant coefficients on the variable that indicates that a hedge or private equity fund participated in the syndicate of the term loan B facility implies that when a hedge or private equity fund invests in the term loan B facility, the spread gap between the term loan B and term loan A facilities appears to be 17 basis points abnormally higher while the spread gap between term loan B facilities and revolvers is about 78 basis points higher when we include firm level controls. None of the comparable coefficients indicating that other types of non-bank institutional investors participated in the syndicate of the term loan B facilities are statistically significant. These results suggest that loan facilities in which hedge and private equity funds invest have higher spreads than otherwise similar facilities in which other types of institutions invest.

4.3. The size of the non-bank syndicate members' loan share

The results so far are consistent with the view that when arrangers are concerned about being able to raise capital from banks, they increase spreads to attract non-bank institutional investors. An additional implication of

this logic is that arrangers should increase spreads by a larger amount when they require a greater quantity of capital from the non-bank institutional investors. Therefore, we expect to observe higher spreads when non-bank stakes in loan facilities are larger.

We evaluate this prediction in Panel A of Table 9, using the subsample of 3,826 loan facilities for which DealScan contains data on syndicate member ownership and all other required data are available.[23] In columns 1 and 2, we include all facilities for which ownership data are available and in columns 3 and 4 we restrict the sample to non-bank facilities. Columns 1 and 3 contain the non-bank syndicate members' facility share, while columns 2 and 4 contain an indicator variable that indicates whether the non-bank institutional investor purchased the largest stake in the loan facility.

The coefficients in Panel A of Table 9 all suggest that when the non-bank institutional investor takes a larger stake in the loan facility, spreads are higher. The coefficients on the non-bank syndicate members' loan shares in columns 1 and 3 are positive and statistically significant, as are the coefficients in columns 2 and 4 on the indicator variable indicating whether the non-bank institutional investor has the largest loan share in the loan facility. These results are consistent with the view that arrangers increase the loan facility's spread to attract non-bank institutional investors, and the more capital they have to raise from these investors, the greater the arrangers increase the spread.

4.4. "Dual" holders of both debt and equity

A number of non-bank investors in syndicated loan facilities also are equity holders in the firm. Such "dual holding" has become increasingly common in recent years (see Jiang, Li, and Shao, 2010). Presumably, institutional equity holders would utilize their informational or strategic advantage inside the borrowing firm to improve their other investments including those in the firm's syndicated loan facilities. In addition, larger equity ownership implies that the investor will share a larger fraction of the gains created through a value-increasing loan. We evaluate the extent to which equity ownership influences the size of the non-bank premium.

To identify whether the non-bank institutional lender held an equity stake in the borrower prior to the loan origination, we create a list of shareholders of the borrowing company from Thomson Reuters Institutional Holdings Database (13F) for the one-year period leading up to the current loan, as well as the list of lenders who are participating in the current loan. For example, for a loan originated in April 2000, we create a list of equity holders using four 13F filings: filings for the quarters that end in June 1999, September 1999, December 1999, and March 2000, respectively. An institutional investor's equity stake

---

[23] We only include facilities for which more than 90% of ownership can be identified. When we further restrict the sample to facilities having 100% of ownership identified, the sample size decreases to 3,641. The results when we re-estimate all equations in Panel A of Table 9 using this smaller sample are similar to those reported in Panel A of Table 9.

is measured as the average of the holdings that appear in these four filings. We focus on the equity stake held by lenders *prior* to loan origination because we wish to evaluate the effect of holding an equity position on the loan decision. We then match lender information from DealScan to the institutional investors in the 13F by the lender's name, and the lender's ultimate parent's name.

In column 1 of Panel B of Table 9, we re-estimate Eq. (1) including a variable indicating whether there is a non-bank syndicate member that is a dual holder. The regression includes 314 loan facilities with participation by a non-bank dual holder. The coefficient on this variable is positive, but not statistically significantly different from zero. In column 2 of Panel B of Table 9, we break up this variable by type of non-bank institutional investor, and also include the type indicator variables.[24] When a hedge fund or private equity fund is a member of the facility's syndicate, the facility's spread is 30.9 basis points higher. When a hedge fund or private equity fund also owns at least 0.1% of the borrowing firm's equity, the facility trades at a premium of 60.4 basis points ($=30.9+29.5$), which is statistically significant at the 1% level. This finding suggests that, especially when they are equity holders, hedge and private equity funds can be viewed as lenders of last resort, and will lend to firms but only at a large premium.

5. Conclusion

Participation by non-bank institutions has become a major part of the syndicated loan market. In our sample of 20,031 "leveraged" loan facilities originated between 1997 and 2007 from the DealScan database, 6,279 facilities have at least one non-bank institution syndicate member. Some of these non-bank institutions have substantially higher required returns than banks, yet both banks and non-bank institutions invest in the same loan facilities. One explanation for this phenomenon is that loan arrangers approach non-bank institutional investors when they cannot fill the syndicate with banks, and consequently, have to offer a higher spread to attract non-bank institutional investors.

We estimate the abnormal spread that a non-bank institutional investor receives by comparing spreads on loan facilities with non-bank institutional investors to those on observationally equivalent facilities that do not have a non-bank institutional investor. Our estimates indicate, holding all else equal, that loan facilities with a non-bank syndicate member receive a higher spread than otherwise similar facilities with bank-only syndicates. The positive spread is statistically and economically significant for revolvers as well as term loan facilities and for loan facilities to borrowers of different credit ratings as well as unrated borrowers.

It is possible that the presence of a non-bank institutional investor is correlated with other, potentially unobservable factors related to the loan facility's spread, which could drive the non-bank premiums. For example, it is possible that the risk of the firms in which non-bank institutions tend to invest tends to be higher than is reflected in their accounting variables or credit ratings. To address this possibility, we use a "within-loan" estimation approach that compares differences in spreads across facilities of the same loan. Since different facilities of the same loan share the same underlying risk and have the same seniority, unobservable differences in risk cannot explain differences in spreads of facilities of the same loan.

Because factors such as maturity and implicit options affect the spreads of different types of facilities, we test whether the existence of a non-bank institutional investor affects the *relative* difference in spreads, holding other factors constant. Our results suggest that in a loan with both a term loan B facility and a revolver, if a non-bank institution invests in a term loan B facility, the spread between the two is higher than would be expected without non-bank participation. In the subsample of non-bank loans that have multiple tranches of the same type, the facilities with non-bank institutional investor participation have higher spreads than the facilities without non-bank participation. These results are not consistent with the view that non-bank premiums reflect unobservable borrower risk. Instead, they suggest that non-bank institutional investors can be viewed as lenders of last resort, and receive higher spreads because they are willing to provide capital to loan facilities that are hard to fill at times when banks are not.

Our results suggest that there are substantial differences in premiums going to different types of non-bank institutional investors. When private equity and hedge funds are non-bank investors, they receive a 35.4 basis-point premium over other loan facilities. In contrast, other types of non-banks institutional investors such as insurance companies or mutual funds receive essentially no abnormal premium at all. In addition, abnormal spreads are higher when the hedge or private equity funds have equity positions in the firm, and when they purchase a larger share of the loan facility.

Non-bank institutional investors, especially private equity and hedge funds, have become important lenders to corporations through their role in the syndicated loan market. The evidence in this paper suggests that the non-bank institutions obtain higher interest rates than other investors. This spread premium appears to be due to the circumstances under which capital is provided rather than unobserved borrower risk.

As debt markets mature, it seems evident that non-traditional players will provide capital to a larger degree than has been true historically. Our results suggest that non-bank institutions provide capital when capital-raising is difficult to firms and receive a premium for providing the financing. Why is it optimal to have different types of investors providing the capital for the same loans? To what extent does borrower performance depend on the provider of capital? Is there important variation across banks that lead some to be more prone to co-invest with hedge funds and private equity funds in loans with higher spreads? Understanding the answers to these and related questions would be a useful direction for future research.

---

[24] The regression includes 17 facilities with insurance company dual holders, 105 facilities with finance company dual holders, 47 facilities with hedge fund and private equity fund dual holders, 215 facilities with mutual fund dual holders, and 23 facilities with other types of non-bank institutional dual holders.

Table A1
Variable definitions

Variables	Definition
Non-bank syndicate member	An indicator variable that takes a value of one if the loan facility has at least one non-bank (neither commercial bank nor investment bank) institutional syndicate member, and zero otherwise. *Source*: DealScan
Non-bank syndicate members' loan share	Sum of loan facility shares held by non-bank (neither commercial bank nor investment bank) institutional investors divided by the total loan facility amount. *Source*: DealScan
Non-bank syndicate member is the largest lender	An indicator variable that takes a value of one if non-bank (neither commercial bank nor investment bank) institutional investor(s) funded the largest share of the facility, zero otherwise. *Source*: DealScan
Non-bank syndicate member is a dual-holder	An indicator variable that takes a value of one if the loan facility has the participation of at least one non-bank (neither commercial bank nor investment bank) syndicate member who held at least 0.1% of equity stake in the same borrowing company during the one-year period leading up to the current loan, and zero otherwise. *Source*: DealScan, Thomson Reuters Institutional Holdings Database (13F)
Non-bank syndicate member is the largest lender and a dual-holder	An indicator variable that takes a value of one if non-bank (neither commercial bank nor investment bank) institutional syndicate member(s) in the facility is the largest lender and also held at least 0.1% of equity stake in the same borrowing company during the one-year period leading up to the current loan, and zero otherwise. *Source*: DealScan, Thomson Reuters Institutional Holdings Database (13F)
All-in-drawn spread	Basis point spread over LIBOR plus the annual fee and the up-front fee spread, if there is any. *Source*: DealScan
Log (facility amount)	Natural log of the facility size. *Source*: DealScan
Log (number of participating lenders)	Natural log of the number of participating lenders in the facility syndicate. *Source*: DealScan
Relationship score	$\frac{1}{N} \times \sum_{j}^{N} \frac{\text{Number of facilities between lead}_i \text{ and participant}_j \text{ in the past 3 years}}{\text{Number of facilities arranged by lead}_i \text{ in the past 3 years}}$, where N is number of participating lenders. Relationship score is considered to be zero for sole-lender loans. *Source*: DealScan
Log(maturity)	Natural log of the maturity of the facility in months. *Source*: DealScan
Secured indicator	An indicator variable that takes a value of one if the facility is secured, and zero otherwise. *Source*: DealScan
Performance pricing indicator	An indicator variable that takes a value of one if the facility has performance pricing features, and zero otherwise. *Source*: DealScan
Covenant indicator	An indicator variable that takes a value of one if the loan has covenants, and zero otherwise. *Source*: DealScan
Sole-lender indicator	An indicator variable that takes a value of one if the loan is funded by a sole-lender, and zero otherwise. *Source*: DealScan
Revolver indicator	An indicator variable that takes a value of one if the facility type is a revolving line of credit (Revolver/ Line, Revolver, 364-Day Facility, Demand Loan, Limited Line in DealScan), and zero otherwise. *Source*: DealScan
Term loan A facility indicator	An indicator variable that takes a value of one if the facility type is term loan A facility, and zero otherwise. *Source*: DealScan
Term loan B facility indicator	An indicator variable that takes a value of one if the facility type is term loan B facility or higher (C, D, …, H) or unlabeled, and zero otherwise. *Source*: DealScan
Log (total assets)	Natural log of the total assets of the borrower at the end of fiscal year prior to the current loan. *Source*: Compustat
Fixed assets/Total assets	The borrower's asset tangibility at the end of fiscal year prior to the current loan, calculated as Net Property, Plant, and Equipment (PP&E)/Total Assets. *Source*: Compustat
Z-score	Altman's Z-score for the borrower at the end of fiscal year prior to the current loan. Z-score is calculated as $Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5$, where X_1 is working capital/total assets, X_2 is retained earnings/total assets, X_3 is EBIT/total assets, X_4 is market value of equity/book value of total liabilities, and X_5 is sales/total assets (Altman, 1968). *Source*: Compustat
Leverage	The borrower's book leverage ratio at the end of fiscal year prior to the current loan, calculated as book value of total debt/book value of total assets. *Source*: Compustat
Industry-adjusted ROA	The borrower's ROA in excess of the median of the corresponding two-digit SIC industry ROA at the end of fiscal year prior to the current loan. *Source*: Compustat
Log (number of analyst following)	Natural log of the number of analysts following the borrower's stock. Missing values are coded as zero.

Table A1 (*continued*)

Variables	Definition
	Source: I/B/E/S
Institutional holdings	The sum of the borrower's stock held by all institutional investors at the end of fiscal year prior to the current loan. Missing values are coded as zero.
	Source: Thomson Reuters Institutional Holdings Database (13F)
S&P issuer rating	The borrower's S&P long-term domestic issuer credit rating. A lower value corresponds to a lower rating, with the highest rating (AAA) receiving a value of 22 and the lowest rating (D) receiving a value of 1. Missing ratings are assigned a value of zero.
	Source: Compustat
Unrated	An indicator variable that takes a value of one if the borrower's S&P long-term issuer credit rating is missing, and zero otherwise.
	Source: Compustat
High-yield spread	Market credit spread in the month of loan issuance. The credit spread is measured as (Bank of America Merrill Lynch US Corporate High Yield BB Option-Adjusted Spread – Bank of America Merrill Lynch US Corporate AAA Option-Adjusted Spread) in basis points.
	Source: Federal Reserve Bank

Table B1
Summary statistics for the final sample used in regressions.

This table presents summary statistics for the final sample of leveraged loan facilities that has a full set of data for the most recent fiscal year-end prior to the loan facility origination during the 1997–2007 period (12,346 facilities). All continuous variables are winsorized at the 1% and 99% levels. Variable definitions are reported in Appendix A.

|	N	Mean	25th Pct.	Median	75th Pct.	Std. dev.
Panel A: Facility characteristics						
Facility amount ($MM)	12,346	159	17	65	200	253
Number of participating lenders	12,346	6.18	1.00	3.00	8.00	7.31
Relationship score	12,346	0.076	0.000	0.050	0.141	0.086
Maturity (months)	12,346	45.68	27.00	47.00	60.00	23.12
Secured indicator	12,346	0.731	0.000	1.000	1.000	0.443
Performance pricing indicator	12,346	0.494	0.000	0.000	1.000	0.500
Covenant indicator	12,346	0.821	1.000	1.000	1.000	0.383
Sole-lender facility indicator	12,346	0.123	0.000	0.000	0.000	0.329
Revolver indicator	12,346	0.653	0.000	1.000	1.000	0.476
All-in-drawn spread	12,346	249.4	155.0	225.0	300.0	127.4
Non-bank syndicate member	12,346	0.280	0.000	0.000	1.000	0.449
Panel B: Borrowing firm characteristics						
Total assets ($MM)	12,346	1,640	96	333	1,128	4,053
Fixed assets/Total Assets	12,346	0.314	0.120	0.251	0.462	0.236
Z-score	12,346	3.170	1.315	2.462	3.992	3.684
Leverage	12,346	0.598	0.393	0.562	0.731	0.329
Industry-adjusted ROA	12,346	−0.080	−0.107	−0.030	0.015	0.202
Number of analyst following	12,346	4.415	1.000	2.833	6.333	4.884
Institutional holdings	12,346	0.427	0.124	0.407	0.702	0.321
Has S&P issuer rating	12,346	0.426	0.000	0.000	1.000	0.494
S&P issuer rating (conditional on having a credit rating)	5,255	9.944	9.000	10.000	11.000	2.658
Panel C: Percent of average loan share (conditional on participation)						
All bank syndicate members	3,664	94.8	100.0	100.0	100.0	14.3
Commercial bank	3,620	90.0	85.5	100.0	100.0	17.7
Investment bank	1,034	21.0	9.1	15.1	25.0	20.0
All non-bank syndicate members	855	44.2	13.3	33.3	80.0	35.8
Insurance company	77	11.2	4.0	8.0	13.3	13.6
Finance company	654	35.3	8.2	20.0	50.0	34.7
HF/PE	297	34.5	9.2	19.6	50.0	33.9
Mutual fund	111	16.6	4.0	9.5	20.0	19.0
Other non-bank syndicate members	78	22.4	2.5	6.5	25.8	32.2
Panel D: Percent of being largest lender (conditional on participation)						
All bank syndicate members	3,664	96.6	100.0	100.0	100.0	18.2
Commercial bank	3,620	94.3	100.0	100.0	100.0	23.3
Investment bank	1,034	28.0	0.0	0.0	100.0	44.9
All non-bank syndicate members	855	47.0	0.0	0.0	100.0	49.9
Insurance company	77	7.8	0.0	0.0	0.0	27.0
Finance company	654	41.4	0.0	0.0	100.0	49.3
HF/PE	297	34.3	0.0	0.0	100.0	47.6
Mutual fund	111	19.8	0.0	0.0	0.0	40.0
Other non-bank syndicate members	78	20.5	0.0	0.0	0.0	40.6
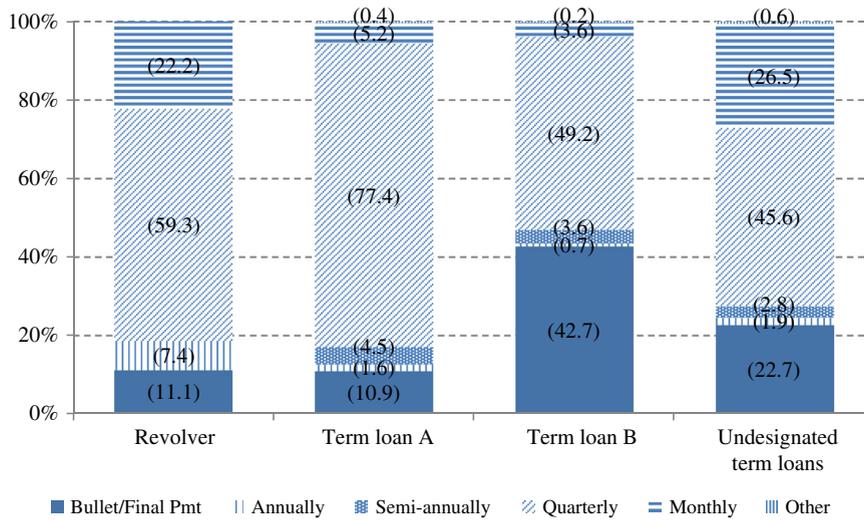
Fig. C1. Distribution of payment schedule by loan facility type. The percentages within each type of facility are calculated based on 27 revolvers, 558 term loan A facilities, 1,655 term loan B facilities, and 1,750 undesignated term loans, respectively, for which payment schedule information is available from DealScan.

Table C1

Spread and payment schedule by facility type.

　This table presents comparisons of loan facility attributes for our sample of 20,031 leveraged loan facilities by facility type. The sample of leveraged loan facilities is from the DealScan database, originated between 1997 and 2007.

	Revolver		Term loan A		Term loan B		Undesignated term loans	
Total number of facilities in sample	12,421		956		2,890		3,764	
Avg. all-in-drawn spread								
Mean	230		271		311		301	
Median	225		250		275		275	
Payment schedule	N	(%)	N	(%)	N	(%)	N	(%)
Payment schedule information available	27	(0.2)	558	(58.4)	1,655	(57.3)	1,750	(46.5)
Payment period								
Bullet/Final payment	3	(11.1)	61	(10.9)	707	(42.7)	397	(22.7)
Annually	2	(7.4)	9	(1.6)	11	(0.7)	33	(1.9)
Semi-annually	0	(0.0)	25	(4.5)	59	(3.6)	49	(2.8)
Quarterly	16	(59.3)	432	(77.4)	815	(49.2)	798	(45.6)
Monthly	6	(22.2)	29	(5.2)	59	(3.6)	463	(26.5)
Other	0	(0.0)	2	(0.4)	4	(0.2)	10	(0.6)

Appendix A. Variable definitions

　Table A1.

Appendix B. Summary statistics

　See Table B1.

Appendix C. Spread and payment schedule by facility type

　See Fig. C1 and Table C1.

References

Altman, E., 1968. Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy. Journal of Finance 23, 589–609.

Berger, A., Udell, G., 1990. Collateral, loan quality, and bank risk. Journal of Monetary Economics 25, 21–42.

Brophy, D., Ouimet, P., Sialm, C., 2009. Hedge funds as investors of last resort? Review of Financial Studies 22, 541–574.

Chava, S., Roberts, M., 2008. How does financing impact investment? The role of debt covenants. Journal of Finance 63, 2085–2121.

Chung, J., Sensoy, B., Stern, L., Weisbach, M., 2012. Pay for performance from future fund flows: the case of private equity. Review of Financial Studies 25, 3259–3304.

Erel, I., Julio, B., Kim, W., Weisbach, M., 2012. Macroeconomic conditions and capital raising. Review of Financial Studies 25, 341–376.

Hadlock, C., Pierce, J., 2010. New evidence on measuring financial constraints: moving beyond the KZ index. Review of Financial Studies 23, 1909–1940.

Ivashina, V., 2009. Asymmetric information effects on loan spreads. Journal of Financial Economics 92, 300–319.

Ivashina, V., Sun, Z., 2011. Institutional demand pressure and the cost of corporate loans. Journal of Financial Economics 99, 500–522.

Jiang, W., Li, K., Shao, P., 2010. When shareholders are creditors: effects of the simultaneous holding of equity and debt by non-commercial banking institutions. Review of Financial Studies 23, 3595–3637.

Lim, J., Sensoy, B., Weisbach, M., 2013. Indirect incentives of hedge fund managers. Unpublished working paper. Ohio State University and University of Missouri at Columbia.

Nadauld, T., Weisbach, M., 2012. Did securitization affect the cost of corporate debt? Journal of Financial Economics 99, 332–352.

Nandy, D., Shao, P., 2010. Institutional investment in syndicated loans. Unpublished working paper. Brandeis University.