

# When Shareholders Are Creditors: Effects of the Simultaneous Holding of Equity and Debt by Non-commercial Banking Institutions

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This article provides a comprehensive analysis of a new and increasingly important phenomenon: the simultaneous holding of both equity and debt claims of the same company by non-commercial banking institutions (“dual holders”). The presence of dual holders offers a unique opportunity to assess the existence and magnitude of shareholder-creditor conflicts. We find that syndicated loans with dual holder participation have loan yield spreads that are 18–32 bps lower than those without. The difference remains economically significant after controlling for the selection effect. Further investigation of dual holders’ investment horizons and changes in borrowers’ credit quality lends support to the hypothesis that incentive alignment between shareholders and creditors plays an important role in lowering loan yield spreads. (*JEL* G20, G32)

The objectives of shareholders and creditors often diverge. As has been understood since the seminal work of [Jensen and Meckling \(1976\)](#) and [Myers \(1977\)](#), this divergence can result in a conflict of interest whereby managers,

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who ultimately bear fiduciary responsibility to shareholders, may take actions that maximize stockholder wealth rather than the total value of the firm. Not surprisingly, the expected cost of such opportunistic behavior on the part of managers (on behalf of the shareholders) should be incorporated into the ex ante contracting of the debt, including its pricing.

What happens if shareholders are also creditors? The increasing presence of non-commercial banking institutions<sup>1</sup> (which are traditionally shareholders) in the syndicated loan market (which is traditionally the exclusive territory of commercial banks) raises this question. The simultaneous holding of both significant equity positions and debt claims of the same firm by these institutions (henceforth, “dual holding”) is a relatively recent phenomenon that, to date, has not been systematically analyzed in the literature. Our article seeks to fill this void.

Dual holding offers a unique angle to explore the effect of shareholder-creditor conflicts in corporate finance, and allows us to test two hypotheses. The first hypothesis is that dual holders should, at least partially, internalize the conflicts between the two roles (shareholder and creditor) they assume. Hence, their presence should mitigate the conflict described above and lead to lower borrowing costs (the “incentive alignment hypothesis”). The second hypothesis is that dual holders may possess better information due to their involvement on both the debt and the equity sides. Therefore, they are able to selectively participate in loans issued by firms with better credit quality (the “information hypothesis”). Both hypotheses predict a negative correlation between loan yield spreads and the presence of dual holders, albeit for different reasons. The focus of our empirical analysis is to assess the relative importance of the two hypotheses.

Using data on syndicated loans for the period 1987–2006, we document a rising trend in the participation of non-commercial banking institutions in the syndicated loan market, and a similar trend of these investors being dual holders. The correlation between the two trends is not surprising given that the former is a necessary condition for the latter. However, the loan and borrower characteristics that are associated with these institutions’ participation and those of dual holding have commonalities as well as dissimilarities.

We find that non-commercial banking institutions tend to participate in loans issued by risky borrowers (such as those with high book-to-market, high leverage, poor credit ratings, poor recent stock performance, and/or high return volatility) and/or for risky purposes (such as LBOs and takeovers). Such a preference for debt is in stark contrast to institutional investors’ general preference for “prudent” investment on the equity side. In fact, they lend to companies that have lower institutional ownership and lower analyst coverage. Not

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<sup>1</sup> We use the term “non-commercial banking institutions” to refer to financial institutions that do not have major commercial banking business. Following its traditional definition, we use the term “commercial banks” to refer to depository-taking institutions that grant credit mainly through lending.

surprisingly, such loans tend to command a higher loan yield spread. Dual holders, on the other hand, do not exhibit a preference for risky loans but tend to lend to firms after favorable stock returns.

Next, we demonstrate that syndicated loans with non-commercial banking institutional dual holders are associated with lower loan yield spreads (by 18 to 32 bps) as compared to other loans funded by the same group of lenders who are not shareholders of the borrower. The negative relation remains in the presence of firm fixed effects, and is, therefore, not driven by firm-specific heterogeneity. These results are consistent with both the incentive alignment and the information hypotheses. Thus, we implement additional tests to disentangle the two.

We first apply a treatment regression approach to separate a treatment effect from a selection effect of dual holders. The procedure yields a stronger negative correlation between the loan yield spreads and the presence of dual holders, implying that loans involving dual holders are riskier at the point of origination conditional on observable loan and borrower characteristics, consistent with an allocation of inherently riskier loans to investors who are better positioned to monitor. Second, we find that dual holders exhibit longer investment horizons on both the debt and the equity sides, both before and after the current loan deal. They have a stronger lending relationship with borrowing firms than pure creditors, and they hold equity stakes for a longer time than pure shareholders. The longer investment horizon affords a more favorable benefit-cost trade-off for dual holders to monitor corporate managers and/or other shareholders to prevent them from expropriating creditors.

Finally, we analyze the changes in borrowers' credit quality and operating performance around loan origination. We find that companies with dual holders, though riskier before the new loans, experience less borrower risk-shifting and less deterioration in return on equity after assuming the new loans. Proprietary data on credit default swaps (CDSs) allows us to further distinguish the two hypotheses in that CDS prices reflect forward-looking and aggregate information possessed by all market participants (mostly sophisticated institutional investors including active investors of syndicated loans). Borrowers with dual holders typically have higher default spreads (i.e., riskier debt) during the years prior to loan origination, but not afterward. Thus, if the lower spreads are attributable to dual holders' superior information, then it must be that information is not yet reflected in the current CDS pricing, or it is unavailable to all CDS market participants, a highly unlikely scenario. In summary, the cumulative evidence in our article points to a significant effect of dual holders on loan yield spreads due to incentive alignment.

Our article contributes to several strands of the literature. First, while prior research quantifies shareholder-creditor conflicts in specific corporate events such as LBOs (Asquith and Wizman 1990; Warga and Welch 1993), mergers and acquisitions (Billett, King, and Mauer 2004), and spin-offs (Maxwell and Rao 2003), this article provides a direct test of the presence and magnitude

of the conflicts of interest between shareholders and creditors during regular financing activities.

Second, this article adds to the sizeable literature on institutional monitoring, demonstrating that certain types of institutional investors are able to exert influence on important corporate decisions such as mergers and acquisitions (Gaspar, Massa, and Matos 2005; Chen, Harford, and Li 2007) and CEO compensation and turnover (Hartzell and Starks 2003; Parrino, Sias, and Starks 2003). In this article, we identify dual holders as emergent and important types of monitors for the opportunistic behavior of shareholders against creditors.

Our article is closely related to several recent papers that examine the correlation between loan pricing and the extent of connectedness between lending banks and borrowing companies. Using data on global syndicated loans, Ferreira and Matos (2009) indicate that bank-firm connections (board representation and direct or indirect equity ownership) increase a bank's chance of being selected as a lead arranger in loan syndication and adversely affect the loan yield spreads. Moreover, firms borrowing from connected banks experience a reduction in credit risk after assuming the loan. Santos and Wilson (2009) find that banks charge lower rates on loans to firms in which they have voting stakes, suggesting that banks' voting stakes are effective in constraining the borrower's risk-shifting incentives.

Our article differs from, as well as complements, the aforementioned papers along the following dimensions. First and foremost, we examine dual holding by institutions that are not the traditional lenders (i.e., commercial banks), while the previously referenced papers mostly focus on the relationship between banks and borrowers. Our sensitivity analyses compare the effects of dual holding by commercial banks and that by non-commercial banking institutions, and find a much weaker relation between dual holding by commercial banks and loan yield spreads. Such a contrast could be due to differences in both the type of loans that these two groups of institutions participate in and the nature of their equity holdings.<sup>2</sup> Second, our focus is on testing the conflicts of interest between shareholders and creditors that arise in the normal course of business, and differentiating the incentive alignment from the information effect. Finally, we explore research questions that have not been previously addressed, such as the characteristics of loans and borrowers that attract non-commercial banking institutions and their dual holding, and the extent of the interaction between dual holders and their invested companies.

The outline of the article is as follows. Section 1 develops our hypotheses. Section 2 describes our data and provides an overview of non-commercial banking institutions' participation in syndicated loans and the phenomenon of dual holding. Section 3 examines the determinants of their participation and

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<sup>2</sup> Due to regulatory restrictions, a large percentage of equity holdings disclosed in the 13F filings by commercial banks are in fiduciary capacity, such as trust accounts, or are aggregated from subsidiaries.

dual holding, as well as the correlation between the presence of dual holders and loan pricing. Section 4 differentiates the two hypotheses regarding the relationship between dual holding and loan yield spreads. Finally, Section 5 summarizes the findings and concludes.

## 1. Hypothesis Development

According to [Jensen and Meckling \(1976\)](#) and [Myers \(1977\)](#), creditors need to be wary of wealth expropriation by shareholders or by managers who act on behalf of shareholders. The incentive to expropriate is rooted in the different nature of cash flow claims to which shareholders and creditors are entitled. In particular, shareholders have an incentive to increase firm risk or to divert assets after leverage increases. Although creditors could protect themselves from such opportunistic behavior by adding provisions to loan contracts and engaging in covenant monitoring, such protections are far from perfect ([Dichev and Skinner 2002](#); [Chava and Roberts 2008](#)). As a result, the risk of expropriation is expected to be reflected in the borrowing costs.

The simultaneous holding of equity and debt in the same firm by the same institutions offers a unique venue to entertain two hypotheses regarding the conflicts between shareholders and creditors. The first is the incentive alignment hypothesis. Shareholders who are also creditors have an incentive to monitor and prevent managers and/or other large shareholders from taking actions that expropriate creditors because they internalize (at least partially) the cost to creditors arising from the opportunistic behavior of shareholders. Therefore, if shareholder-creditor conflicts are significant enough to affect the cost of debt, we would expect to see a decrease in borrowing costs when dual holders are present. The above hypothesis leads to two related predictions. First, dual holders tend to have longer investment horizons in the invested company, permitting a more favorable amortization of their monitoring costs. Second, companies borrowing from dual holders should experience less borrower risk-shifting after receiving the new loan than those borrowing from a syndicate without dual holders.

Our second hypothesis of interest is the information hypothesis. Being involved in both equity and debt may provide dual holders an informational edge, allowing them to select borrowing firms that are of lower default risk which, in turn, carry lower loan yield spreads. On the equity side, institutions with significant equity stakes are likely to be more informed than other shareholders due to their research efforts and better access to managers.<sup>3</sup> On the debt side, syndicated loans are private financing arrangements through which confidential

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<sup>3</sup> For example, [Nofsinger and Sias \(1999\)](#) find that changes in institutional ownership forecast next year's returns. [Chen, Harford, and Li \(2007\)](#) confirm that long-term independent institutions with concentrated holdings appear to be able to predict future performance of acquirers.

information about the issuing firm is revealed to lenders.<sup>4</sup> Collectively, dual holders could potentially possess superior information and may be able to seek out companies with better credit quality. As a result, borrowers with dual holders could be associated with lower costs of debt conditional upon observable loan and firm characteristics.

## 2. Data Overview

### 2.1 Sample description

Our primary data sources for debt and equity holdings by institutions are from the Reuters Loan Pricing Corporation's (LPC) DealScan syndicated loan database and the Thomson Financial Ownership database, respectively. Our sample starts in 1987 since there were not many deals (less than a couple of hundreds a year) in the database before that. Syndicated loans have since become a large and increasingly important source of corporate finance. The ratio of total syndicated loan issues to total debt outstanding by Compustat companies varies from 5.1% to 11.1% during our sample period 1987–2006, with a 7.3% sample period average.

We rely on syndicated loans, rather than corporate bonds, as debt instruments due to the following considerations. First, syndicated loans suit the purpose of our study better than bonds. Amihud, Garbade, and Kahan (1999) argue that when compared to loans, owners of corporate bonds are both more dispersed and fluid, and, therefore, are less likely to engage in monitoring. Syndicated loans, lying somewhere between relational private bank loans and dispersed public debt, require a significant amount of monitoring from syndicate members (Sufi 2007). Second, the data on syndicated loans is of superior quality and available since the mid-1980s. Finance researchers have employed the syndicated loan data to address important corporate finance questions, such as the role of information asymmetry in financing arrangements (Sufi 2007), financing and investment (Chava and Roberts 2008), and lending relationship and loan contracting (Drucker and Puri 2009).

To gauge the specificity of the syndicated loan receiving companies, we compare the main characteristics of our sample firms to those of the bond issuing companies and the universe of public companies.<sup>5</sup> When compared to all publicly traded companies, syndicated loan receiving companies are larger, more levered, and have lower book-to-market, lower Altman Z-scores, and higher institutional equity ownership and analyst coverage. Firms that issue public bonds differ from the typical public firm in the same direction as

<sup>4</sup> In recent years, the loan-side non-public information often became available to traders and potential investors who were not (yet) investors in the loans due to the rapid expansion of a secondary market for syndicated loans and a more aggressive effort by the press to report on the loan market. See *A Guide to the Loan Market*, Standard and Poor's (2007).

<sup>5</sup> The list of bond issuing firms and the offering dates are retrieved from the Mergent FISD database, available through WRDS.

syndicated loan receiving companies, but to an even greater extent. Therefore, firms issuing syndicated loans are relatively more representative of the population of public firms than those issuing bonds. A concurrent paper by [Manconi and Massa \(2009\)](#) conducts detailed analyses on the joint holding of equity and corporate bonds in the same firm by institutional investors.

Syndicated loans are usually awarded through a bidding process. The winning arrangers prepare a memo describing the proposed terms of the transaction, including pricing, structure, covenants, and collateral. While preparing the information memo, the arrangers solicit informal feedback from potential investors on their interest in the deal, especially in terms of pricing and investment commitment. Once the feedback is incorporated, the arrangers formally market the deal to investors in general. Throughout this process, members of the syndicate can express their preferences on the terms of the transaction.<sup>6</sup>

The initial DealScan data consists of 95,220 U.S. loan facilities. We screen the data using the following criteria: 1) the all-in-drawn spread is not missing; 2) LIBOR is the base rate;<sup>7</sup> 3) we exclude bankers' acceptance, bridge loans, leases, loan style floating rate notes, standby letters of credit, step payment leases, bonds, notes, guidance lines, traded letters of credit, multi-option facilities, and other or undisclosed loans. The above screening process leaves us with a sample of 60,300 loan facilities associated with 41,919 loan deals. Our analysis is conducted at the loan facility level as the loan-lender relationship is facility specific.<sup>8</sup> That is, within the same loan deal, members of the syndicate may hold different percentages of shares of each facility or participate in a subset of the loan facilities.

We then carefully match the borrowers and/or the borrower's parent name to CRSP/Compustat by a combination of algorithmic matching and manual checking. This match leaves us with a sample of 26,690 loan facilities associated with 19,175 loan deals and 5,015 borrowers that are public companies. These loan facilities are funded by 212,694 facility lenders.

To identify dual holders, we next match the lenders from the above sample with the Thomson Financial Ownership database by the names of the lenders and by the quarter of loan origination to obtain information regarding these lenders' simultaneous holding of equity disclosed in their 13F filings (if there is any). Given our research interest, we distinguish between institutions that are commercial banks (henceforth, "CBs") and non-commercial banking institutions (henceforth, "non-CBs"). Commercial banks are identified in two ways. First, a lender is classified as a CB if its primary four-digit SIC Code provided in DealScan (SIC Code of 6011–6082 and 6712) or its Thomson

<sup>6</sup> [Standard and Poor's \(2007\)](#) provides a summary of the syndication process.

<sup>7</sup> Following the literature on syndicated loans, we use the spread over LIBOR rather than the spread over a reference rate of a particular maturity as the dependent variable. Note that all of our regressions include the maturity of a loan as a control variable.

<sup>8</sup> Sensitivity analysis using information aggregated at the loan-deal level yields similar results.

Financial institution type code (type code = 1) indicates its commercial bank status.<sup>9</sup> Second, we manually classify a lender as a CB if the institution has major commercial banking operations.<sup>10</sup> Most of our analyses will focus on non-CBs, though we provide some comparative analyses on both groups of lenders in Section 3.4.

For a loan to have non-CB dual holders, we require that at least one non-CB lender of the facility has significant equity holdings in the borrowing firm or in the borrower's parent firm in the same quarter in which the loan is originated. The threshold for a "significant" level of equity holding is chosen as follows: The position must amount to at least 1% of the borrower's common stock outstanding or its value must exceed \$2 million (or \$5 million if the lender is a shareholder of the borrower's parent). All values are in 2006 constant dollars using the CPI deflator.

Two additional procedures in identifying dual holders warrant elaboration. First, a lender could be a shareholder by itself, or through its subsidiaries. We rely on two sources to identify all first-level subsidiaries of the lenders in our sample. The first source is lending institutions' (if they are publicly traded companies) 10K filings from various years; and the second source is Federal Financial Institutions Examination Council's website if the 10K filings are not available or if the organization structure is not provided in the 10K filings. For the subset of these subsidiaries whose 13F filings are covered by the Thomson Financial Ownership database, we are able to identify "significant" equity holders (using the same criteria described above). We then classify a lender as a dual holder if either the lender itself or at least one of its subsidiaries holds a significant equity position in the borrowing firm during the quarter of loan origination.

Second, we track both the lender-subsidiary pairings and the classification of a lender as a CB or non-CB dynamically to take into account the expansions and restructurings of financial institutions over time, especially through acquisitions and spin-offs. For example, we aggregate the equity ownership of Highbridge Capital into that of JP Morgan Chase for observations dated after 2004 when the former was acquired by the latter. Moreover, JP Morgan is classified as a non-CB lender before 2000, while JP Morgan Chase is coded as a CB afterward, where the time-varying classification captures JP Morgan's expansion into the commercial banking business after its 2000 merger with Chase.

Finally, our analyses require information from Compustat where the most recent prior year-end firm characteristics variables are retrieved. Our final

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<sup>9</sup> The Form 13F filing with the SEC (from Thomson Financial) classifies institutional investors into five types: 1) banks (narrowly defined as financial institutions that accept and manage deposits and make loans, or loosely "commercial banks"); 2) insurance companies; 3) investment companies; 4) independent investment advisors and 5) other.

<sup>10</sup> Notable examples in this category include JP Morgan Chase and Citigroup. Their primary SIC Code is 6021, and their Thomson Financial type code is "type 5" (other). We nevertheless classify them as CBs because both of them have significant commercial banking operations.

sample contains 13,545 loan facilities associated with 9,891 loan deals and 3,031 borrowers.<sup>11</sup> Non-CB dual holders are present in 2,286 loan facilities associated with 1,679 loan deals and 687 borrowers. The mean (median) equity ownership by a non-CB dual holder in our sample is 0.67% (0.48%), or \$170.3 million (\$64.5 million).<sup>12</sup> The mean (median) loan subscription by a non-CB dual holder is 9.38% (9.17%) of the facility, or \$123 million (\$66.8 million). The vast majority of non-CB dual holders in our sample (79.9%) already hold significant equity positions in the quarter prior to the first time they ever lend to the same company.

A necessary condition for the presence of non-CB dual holders as defined above is the participation of non-CBs in loan syndication. Naturally, some of our empirical analyses will focus on subsamples of loan facilities with non-CB involvement. We define the “non-CB participation subsample” as the subset of facilities where at least one non-CB lender is involved in the lending syndicate. The sample has 5,601 loan facilities. We define the “non-CB major participation subsample” as the subset of facilities where at least one non-CB lender is a major participant<sup>13</sup> of the lending syndicate. The sample has 3,293 loan facilities. For consistency, the dual holders in the second subsample are limited to non-CB dual holders that are also major participants of the lending syndicate.

Table 1 provides summary statistics regarding our key variables of interest, as well as loan and firm characteristics. Detailed variable definitions are given in the Appendix.

In our sample, the average loan yield spread relative to LIBOR is 164 bps and the median loan yield spread is 150 bps. About 40% of the loan facilities have at least one non-CB as a member of the lending syndicate (*non-CB participation*), and about a quarter of the facilities have at least one major member of the syndicate who is a non-CB (*non-CB major participation*). Most interestingly, in 17% of the loan facilities, the non-CB lending institutions are also significant shareholders (*non-CB dual holders*) of the borrowing company. The sample average facility amount is \$360 million in 2006 dollars, and

<sup>11</sup> It is worth noting that our major results remain the same if we remove financial (SIC 6000–6999) and utility (SIC 4900–4999) borrowers.

<sup>12</sup> For comparison, Santos and Wilson (2009) report that in their sample, the average bank controls 0.49% of the borrower’s voting rights. Due to the level of data aggregation both from DealScan and from Form 13F filings, it is possible that the division that extends the loan is different from the division from the same institution that invests in the equity. We take the stance that incentives are in place at the institution level to enhance investment values, and that there are centralized or coordinated efforts within an institution with regard to research, monitoring, and exercise of shareholder rights (Gaspar, Massa, and Matos 2006; Davis and Kim 2007; Chen, Goldstein, and Jiang 2008).

<sup>13</sup> Due to a variety of lender titles used in different loan syndications, there has not been a consensus on how to identify the lead arranger(s) of a syndicate in the literature. In this article, we identify major participants of a loan syndicate based on lenders’ roles specified in DealScan. The lenders with the following roles are considered as the major participants: admin agent, agent, arranger, book runner, co-agent, co-arranger, co-lead arranger, co-lead manager, co-manager, co-syndications agent, coordinating arranger, documentation agent, joint arranger, joint lead manager, lead arranger, lead bank, lead manager, manager, managing agent, mandated arranger, senior arranger, senior co-lead manager, senior lead manager, senior lender, senior managing agent, sole lender, and syndications agent.

the average maturity is 47 months. About half of the loans are secured,<sup>14</sup> about three-quarters of the loans in our sample are revolvers, and close to a fifth of the loans are taken out for the risky purposes of either LBOs or takeovers. The average (median) number of lenders involved in a lending syndicate is 8 (5).

## 2.2 Participation of non-commercial banking institutions in loan syndication

Before analyzing the determinants of non-CB dual holding and its impact on loan pricing and firm performance, we first document a growing phenomenon of new players in loan syndication that traditionally was the exclusive territory

**Table 1**

**Sample overview**

Panel A: Summary statistics

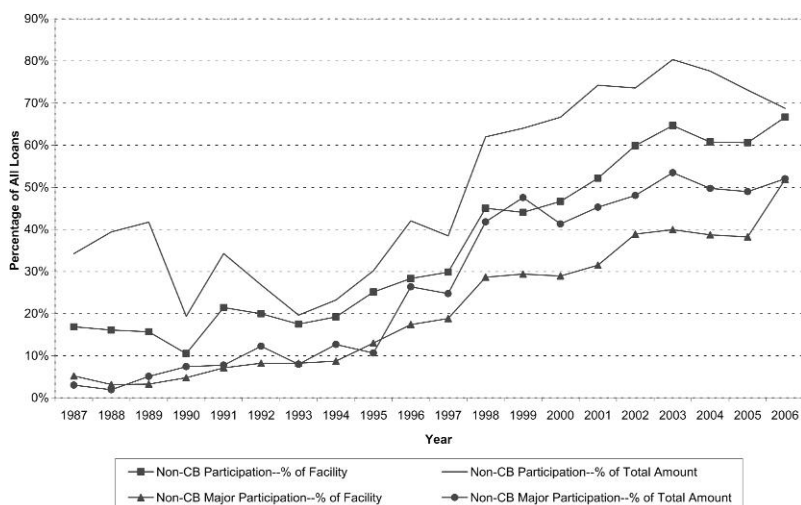
	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
<i>spread</i>	164.489	118.215	67.500	150.000	250.000
<i>non-CB participation</i>	0.414	0.492	0.000	0.000	1.000
<i>non-CB major participation</i>	0.243	0.429	0.000	0.000	0.000
<i>non-CB dual holder</i>	0.169	0.375	0.000	0.000	0.000
<i>CB dual holder</i>	0.200	0.400	0.000	0.000	0.000
<i>facilityamt (mil)</i>	359.742	818.497	44.825	136.032	363.780
<i>facilityamt (log)</i>	4.828	1.542	3.803	4.913	5.897
<i>maturity</i>	47.353	208.538	24.000	48.000	60.000
<i>maturity (log)</i>	3.619	0.711	3.178	3.871	4.094
<i>secured</i>	0.474	0.499	0.000	0.000	1.000
<i>missingsecured</i>	0.340	0.474	0.000	0.000	1.000
<i>revolver</i>	0.761	0.427	1.000	1.000	1.000
<i>lbotakeover</i>	0.195	0.396	0.000	0.000	0.000
<i>numlender</i>	8.163	8.897	2.000	5.000	11.000
<i>numlender (log)</i>	1.839	0.863	1.099	1.792	2.485
<i>assets (mil)</i>	3338.031	7391.507	190.590	645.430	2475.150
<i>assets (log)</i>	6.576	1.797	5.250	6.470	7.814
<i>lev</i>	0.307	0.201	0.166	0.293	0.419
<i>b2m</i>	0.595	0.607	0.289	0.482	0.757
<i>growth</i>	0.230	0.516	0.030	0.118	0.266
<i>herfindahl</i>	0.792	0.261	0.537	1.000	1.000
<i>Inst</i>	0.500	0.246	0.314	0.515	0.691
<i>stkretindadj</i>	-0.001	0.040	-0.020	-0.001	0.017
<i>altman</i>	1.878	1.285	1.118	1.869	2.597
<i>sprate</i>	5.785	6.517	0.000	0.000	12.000
<i>notsprated</i>	0.518	0.500	0.000	1.000	1.000
<i>analyst</i>	10.452	9.393	3.000	8.000	16.000
<i>analyst (log)</i>	2.024	1.011	1.386	2.197	2.833
<i>stkvoll</i>	0.132	0.067	0.085	0.121	0.154
<i>amihud</i>	0.302	0.596	0.038	0.100	0.288
<i>sp500</i>	0.228	0.420	0.000	0.000	0.000

This table reports summary statistics of the main variables. Definitions of the variables are provided in the Appendix. The total number of loan facilities with matched information from Compustat is 13,545. Summary statistics of variables before the log transformation are also reported. Panel A provides descriptive statistics. Panel B reports the pair wise correlation coefficients among the main variables.

(continued)

<sup>14</sup> There is missing information regarding whether the loan is secured or not for about a third of our sample loans.





**Figure 1**  
Participation of non-commercial banking institutions in loan syndication

of commercial banks. Figure 1 plots the time series of non-CB participation and major participation in the syndicated loan market in terms of both the percentage of the total number of loan facilities and the percentage of the total face value of loan facilities.

Figure 1 documents that non-CB participation in the syndicated loans displays an overall increasing trend, with a steep rise after 1996. Before 1996, between 10% and 30% of the facilities had non-CB syndicate members, and, in about half of these cases, they were also among the lead arrangers. Toward the end of our sample, non-CBs were present among 60% to 70% of the loan facilities, in more than two-thirds of which they played a major role. Several institutional developments might have fueled this spurt. In 1995, loans were first rated by the S&P, and a trade association for syndicated lenders, the Loan Syndications and Trading Association (LSTA), was established. In addition, the 1999 repeal of the Glass-Steagall Act of 1933 further blurred the regulatory division between commercial banking and other financial services, and encouraged CBs and non-CBs to engage in each other’s traditional businesses.

The emergence of non-CBs as a new force in syndicated lending coincides with the rise of the market for “leveraged loans” or “high-yield loans.” There is no official definition for the term, but this segment of the market is broadly defined as loans to borrowers with a high committed leverage. Such loans tend to be large in size and are typically associated with low credit rating (below BBB) and high initial loan yield spread (at least 250 bsp above LIBOR).<sup>15</sup> According

<sup>15</sup> This definition is adopted by the LPC.

to this definition, about half of the non-CB loans in our sample are leveraged loans. Our sample period also coincides with a decade of relatively less stringent lending practices. The two trends apparently reinforce each other: The growth of the leveraged loan market attracts the participation of non-CBs, and the addition of the latter to the traditional group of lenders (namely, the CBs) allows borrowers to issue more and riskier loans than previously possible.<sup>16</sup>

Syndicated loans are a highly concentrated business. During our sample period, the top five lenders participate in 88.7% of all syndicated loans. Similar levels of concentration transcend to non-CB lenders where the top five participate in 79.3% of all non-CB lender involved loans. Most of these investors are investment banks. Other investors include insurance companies, investment advisors, and proprietary investors. For completeness and comparison, Table 2 reports the following information for both CB and non-CB top ten dual holders: the total amount of loans in which each top dual holder participated as a lender; the subtotal of loans (in dollar amount and in the number of loan facilities) in which each top dual holder participated as a dual holder; the average percentage of borrower's loans held by each top dual holder (when calculating the percentage numbers, we assume that all syndicate members take an equal share of a loan facility when the facility share information is missing); and finally, the ranking of each top dual holder among all lenders in our sample.<sup>17</sup>

This new phenomenon of participation by non-CBs in loan syndication is interesting on its own and is a necessary condition for firms to have these institutions as dual holders of both equity and debt. To examine the determinants of their participation in loan syndication, we present results of Probit regressions in Table 3. The dependent variables are the indicator variables for non-CB participation and major participation. The explanatory variables include both loan facility and borrower characteristics.

We first examine the determinants of non-CB participation in syndicated loans (Column (1) in Table 3). In terms of the loan characteristics, we find that non-CBs are more likely to participate in large secured term loans with long maturities. Non-CBs also tend to participate in loans for risky purposes (LBOs

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<sup>16</sup> Some recent work, such as Kashyap, Rajan, and Stein (2009), attributes loosening lending standards and financial institutions' search for high-yield assets during the early 2000s as possible major causes that led to the 2007–2008 crisis. Our analyses do not directly contribute to the debate on the causes of the crisis, but highlight the importance of monitoring in reducing the credit risk of borrowers.

<sup>17</sup> The rankings reported in Table 2 are based on the total amount of loans that each top dual holder is involved as a lender over our sample period 1987–2006 and among all the 3,821 lenders in our sample. The rankings we get can be different from the periodically published LPC Lead Arranger League Table due to the following reasons: (1) unlike the LPC league tables in which lenders are ranked based on volume aggregated at the ultimate parent level (or the "Bank Holding Company" level), our rankings are calculated at the lender level; (2) our sample constitutes only part of the DealScan loans due to constraining borrowers to Compustat firms; (3) our rankings are calculated based on cumulative lending activities over our sample period, while the LPC rankings are often calculated based on lending activities over a particular period of time such as one quarter or one year; and (4) the LPC only keeps the most current ultimate parent firm information in its DealScan database and attributes all loans by the merger partners to the merged firm, while we aggregate the loans by the merger partners only after the completion of the merger deals.

Table 2

## Top ten non-commercial banking institutions and commercial bank dual holders

Panel A: Top ten non-CB dual holders

Ranking (1)	Name (2)	Total Amount of Loan Involved (\$mil) (3)	Total Amount of Dual Holding Loans Involved (\$ mil) (4)	Total Number of Dual Holding Loans Involved (5)	Average Percentage of Loan Held in Dual Holding Loans (6)	Ranking Among All Lenders* (7)
1	Credit Suisse First Boston	1,760,000	1,020,000	857	9.17%	15
2	Lehman Brothers	625,000	340,000	181	8.51%	65
3	Merrill Lynch & Co Inc	610,000	322,000	227	8.31%	69
4	Morgan Stanley	370,000	190,000	193	9.65%	95
5	JP Morgan	173,000	116,000	67	17.59%	178
6	Goldman Sachs & Co	310,000	73,600	24	12.59%	111
7	Bear Stearns	137,000	32,600	23	13.51%	206
8	Brown Brothers Harriman & Co	33,300	26,800	10	1.82%	440
9	RBC Capital Markets	85,000	20,000	8	3.11%	265
10	UBS Securities	55,600	17,000	21	12.72%	330

Panel B: Top ten CB dual holders

1	Bank of America	5,260,000	3,380,000	4312	15.47%	1
2	Mellon Bank	2,650,000	2,000,000	1770	7.56%	7
3	Bank of New York	3,820,000	1,890,000	1471	7.01%	2
4	Barclays Bank Plc	2,540,000	1,690,000	1254	7.53%	8
5	Northern Trust	1,820,000	1,430,000	1337	6.40%	14
6	Bank One Corp	1,640,000	1,060,000	1102	11.44%	20
7	JP Morgan Chase	1,490,000	940,000	898	13.40%	24
8	PNC Bank	1,530,000	806,000	565	6.90%	23
9	Bankers Trust Co	925,000	652,000	606	16.52%	45
10	Royal Bank of Canada	2,320,000	626,000	405	6.27%	10

Panels A and B of this table list the top ten non-CB and CB dual holders, respectively. These institutions are ranked by the total amount of loan facilities in which they are involved as dual holders. Columns (1) and (2) show their rankings and names. Column (3) reports the total amount of loan facilities in which an institution is involved. Columns (4) and (5) report the total amount and number of loan facilities in which an institution is involved as a dual holder. Column (6) reports the average percentage of borrower's loan facilities held by each top dual holder (when calculating the percentage numbers, we assume that all syndicate members take an equal share of a loan facility when the facility share information is missing). The last column (7) presents each top dual holder's ranking among 3,821 loan lenders in our sample during 1987–2006.

\* These rankings are non-continuous because of the presence of large lenders who tend not to be dual holders. These large lenders include CBs such as ABN AMRO Bank NV, Chase Manhattan Bank, and Bank of Nova Scotia; and non-CBs such as General Electric Capital Corp, William Street Commitment Corp, and ING Capital LLC.

and takeovers) and be members of a large syndicate (measured by the number of lenders). In terms of the borrower characteristics, non-CBs are more likely to lend to large companies (measured by total assets) with high leverage, high book-to-market, poor recent stock market performance (measured by industry-adjusted stock returns), and to those that are members of the S&P 500 index.

Interestingly, non-CB lenders seek out companies with low institutional equity ownership (conditional on the size of the companies). A one-percentage-point increase in a company's institutional equity ownership is associated with

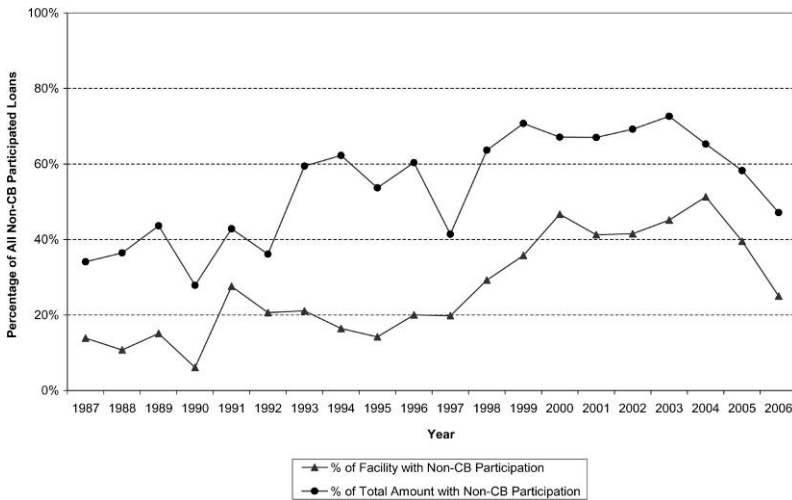
**Table 3**  
**Determinants of non-commercial banking institution participation in loans**

	(1) Non-CB Participation			(2) Non-CB Major Participation		
	Coef	t-stat	dPr/dx	Coef	t-stat	dPr/dx
<i>facilityamt</i>	0.057	2.92***	2.15%	0.101	5.03***	2.80%
<i>maturity</i>	0.108	4.54***	4.11%	0.145	5.68***	4.02%
<i>secured</i>	0.446	8.31***	16.90%	0.409	7.69***	11.41%
<i>missingsecured</i>	0.059	1.24	2.26%	0.034	0.68	0.95%
<i>revolver</i>	-0.231	7.77***	-8.94%	-0.167	5.48***	-4.78%
<i>lbotakeover</i>	0.210	4.38***	8.11%	0.303	5.89***	9.01%
<i>numlender</i>	0.633	19.72***	24.11%	0.086	2.72***	2.39%
<i>assets</i>	0.070	2.63***	2.68%	0.089	3.10***	2.47%
<i>lev</i>	0.631	5.02***	24.03%	0.420	3.08***	11.63%
<i>b2m</i>	0.060	1.75*	2.27%	0.091	2.68***	2.52%
<i>growth</i>	0.050	1.39	1.89%	0.087	2.06**	2.42%
<i>herfindahl</i>	0.070	0.86	2.65%	0.245	2.81***	6.78%
<i>inst</i>	-0.332	3.13***	-12.64%	-0.332	2.88***	-9.18%
<i>stkreindadj</i>	-2.151	4.79***	-81.90%	-1.419	2.95***	-39.27%
<i>altman</i>	0.040	2.44**	1.53%	0.018	1.01	0.51%
<i>sprate</i>	0.022	2.22**	0.85%	0.018	1.62	0.48%
<i>notsprated</i>	0.171	1.16	6.50%	0.158	0.99	4.36%
<i>analyst</i>	-0.079	2.60***	-3.01%	-0.044	1.34	-1.21%
<i>stkvol</i>	3.013	8.67***	114.73%	2.002	5.74***	55.38%
<i>amihud</i>	0.093	2.13**	3.53%	0.101	2.35**	2.79%
<i>sp500</i>	0.158	2.29**	6.08%	0.254	3.34***	7.42%
#obs and pseudo-R <sup>2</sup>	13545	0.260		13545	0.167	
% (Dep Var = 1)	41.4%			24.3%		

Definitions of all variables are provided in the Appendix. The dependent variable is an indicator variable for non-CB participation in loan syndication, measured by non-CB participation in column (1) and non-CB major participation in column (2). The analysis is conducted at the loan facility level. Both specifications are estimated by Probit. Year fixed effects are included. The *t*-statistics are based on standard errors clustered at the firm level. dPr/dx represents incremental change in predicted probability change for one unit of change in the regressor, while holding other regressors at their respective mean levels. \*\*\*, \*\*, \* correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

a 13 bps drop in the probability that the lending syndicate will include at least one non-CB member (significant at the 1% level). This contrast is confirmed in the characteristics of borrowers that attract institutional lenders. While institutions are known to prefer “prudent” stocks with low volatility, high liquidity, high analyst coverage, and strong debt ratings (Del Guercio 1996; Gompers and Metrick 2001), Column (1) of Table 3 indicates that institutional lenders prefer borrowers with exactly the opposite characteristics (the coefficients on the S&P long-term credit rating, analyst coverage, and stock return volatility are all significant at least at the 5% level). The determinants of non-CB major participation in syndicated loans (Column (2)) are similar to those for non-CB participation. Our evidence is consistent with Carey, Post, and Sharpe’s (1998) finding that nonbank lenders tend to serve observably riskier borrowers.

Non-CBs’ preference for risky loans and borrowers, though at odds with their “prudent” tastes for equity investment, reflects their traditional role as equity investors. In other words, the debt in which non-CBs invest tends to exhibit more “equity-like” features. Presumably lenders in such loan deals are more vulnerable to the ex post expropriation by shareholders. If these non-CBs



**Figure 2**  
**Non-commercial banking institution participated loans with dual holders**

are also shareholders in the same company, the agency problem of risky debt should be alleviated, at least to some extent, and be reflected in the cost of borrowing. This is an issue that we analyze next.

### 2.3 Simultaneous holding of debt and equity by non-commercial banking institutions

The rising trend of these non-CBs participating in syndicated loans (see Figure 1) leads to an increasing occurrence of their simultaneously holding both equity and debt positions in the same company (i.e., dual holding). Figure 2 presents the time series plots of dual holding in terms of both the fraction of the total number and the total face value of non-CB participated loan facilities. The figure indicates that the simultaneous holding of equity and debt by non-CBs has been a growing phenomenon coinciding with the growth of their participation in the loan market (see Figure 1). At the peak of 2003–2004, loans that had dual holders account for about half of all non-CB participated loan facilities, and about two-thirds in value-weighted terms.

One goal of our article is to examine the loan and borrower characteristics that are associated with non-CB dual holding. Table 4 reports these findings. Column (1) examines the determinants of dual holding using the full sample. We demonstrate that dual holders are more likely to be associated with larger loans with longer maturities and larger lending syndicates. Borrower characteristics are generally in line with non-CBs’ preference for equity investment. Dual holders target large companies with higher institutional ownership, higher past stock returns, greater analyst coverage, and higher liquidity.

**Table 4**  
Determinants of non-commercial banking institution dual holding

	(1) All Loan Facilities			(2) Non-CB Participation			(3) Non-CB Major Participation		
	Coef	t-stat	dPr/dx	Coef	t-stat	dPr/dx	Coef	t-stat	dPr/dx
<i>facilityamt</i>	0.063	2.28**	0.50%	0.059	1.82*	2.06%	0.093	1.64	0.92%
<i>maturity</i>	0.022	0.75	0.18%	-0.026	0.63	-0.91%	0.066	1.16	0.65%
<i>secured</i>	0.106	1.58	0.85%	-0.171	2.02**	-5.98%	-0.252	1.75*	-2.60%
<i>missingscured</i>	-0.045	0.79	-0.36%	-0.042	0.52	-1.47%	0.322	2.80***	3.65%
<i>revolver</i>	0.003	0.05	0.02%	0.189	3.83***	6.43%	-0.037	0.49	-0.37%
<i>lbtotaleover</i>	0.011	0.16	0.09%	-0.206	2.60***	-6.96%	-0.028	0.21	-0.27%
<i>numlender</i>	0.783	18.12***	6.22%	0.589	9.88***	20.49%	0.081	1.06	0.79%
<i>assets</i>	0.145	3.63***	1.15%	0.141	2.89***	4.92%	0.305	3.74***	3.00%
<i>lev</i>	0.341	1.89*	2.71%	-0.143	0.63	-4.96%	0.041	0.11	0.41%
<i>b2m</i>	-0.019	0.33	-0.15%	-0.110	1.61	-3.83%	-0.100	0.87	-0.98%
<i>growth</i>	0.026	0.35	0.21%	-0.036	0.40	-1.25%	0.184	2.54**	1.81%
<i>herfindahl</i>	-0.013	0.13	-0.10%	-0.049	0.36	-1.69%	0.196	1.03	1.92%
<i>inst</i>	0.367	2.26**	2.92%	0.726	3.55***	25.26%	0.709	2.51***	6.97%
<i>stkrctindadj</i>	1.463	2.17**	11.64%	2.527	3.15***	87.95%	4.800	3.21***	47.16%
<i>altman</i>	0.024	0.91	0.19%	-0.011	0.33	-0.37%	0.001	0.02	0.01%
<i>sprate</i>	-0.012	0.93	-0.09%	-0.040	2.36**	-1.38%	-0.026	0.96	-0.25%
<i>noisprated</i>	-0.131	0.75	-1.05%	-0.450	1.86*	-15.12%	-0.542	1.39	-4.98%
<i>analyst</i>	0.158	3.08***	1.26%	0.234	3.47***	8.14%	0.193	1.69*	1.90%
<i>stvol</i>	0.082	0.15	0.65%	-0.947	1.41	-32.95%	-2.168	2.03***	-21.30%
<i>amihud</i>	-0.632	1.99**	-5.02%	-0.569	1.59	-19.79%	0.007	0.02	0.07%
<i>sp500</i>	0.005	0.06	0.04%	0.036	0.31	1.26%	-0.037	0.23	-0.35%
#obs	45931		0.398	1665		0.413	3293		0.385
% (Dep Var = 1)	16.9%			40.8%			16.6%		

Definitions of all variables are provided in the Appendix. The dependent variable is an indicator variable for the occurrence of dual holding of debt and equity in the same borrowing company by non-CB lenders, and the analysis is conducted at the loan facility level. Column (1) analyzes the full sample, while columns (2) and (3) focus on the subsamples of loan facilities that have non-CB participation and non-CB major participation, respectively. In column (3), we also require at least one of the non-CB dual holders to be a major participant in the loan syndicate. All specifications are estimated by Probit. Year fixed effects are included. The *t*-statistics are based on standard errors clustered at the firm level. dPr/dx represents incremental change in predicted probability change for one unit of change in the regressor, while holding other regressors at their respective mean levels. Superscripts \*\*\*, \*\*, \* correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

Given that non-CB participation in loan syndication is a necessary condition for their dual holding, Columns (2) and (3) in Table 4 further examine the determinants of dual holding among the subsamples of loan facilities where non-CBs participate and have a major presence, respectively. Dual holding is present among 41% (17%) of the non-CB (major) participation subsample, compared to the all-sample average of 17%. Results overall are consistent with those from the full sample. Dual holders are more likely to be present in loans with many lenders and issued by large companies with positive excess stock market returns. It is worth noting that conditional on non-CB participation, dual holders exhibit a preference for unsecured loans (significant at the 5% and 10% levels). In the subsample of non-CB participation, unsecured loans stand a 6.0-percentage-point-higher probability of having dual holders compared to secured loans (see Column (2) of Table 4). This is in contrast with their non-dual holding counterparts' preferences for secured loans (as shown by the significant and positive coefficient on *secured* in Table 3). Nandy and Shao (2007) document that institutional loans are largely collateralized loans in order to meet institutional investors' objectives and constraints, but loans funded by dual holders turn out to be quite different. If collaterals serve to protect against ex post agency costs due to borrowers' opportunistic behavior, this contrast suggests that dual holders might be able to mitigate such agency costs in the absence of collaterals.

### 3. Pricing of Loan Facilities Funded by Non-commercial Banking Institutional Shareholders

#### 3.1 Dual holders and loan pricing: overview

The focus of our research is on the effects of non-CB shareholders turned creditors on the loan deal and on the borrowing company. Naturally, the first question is the effect of dual holding on the loan yield spread. We run regressions with the loan yield spread as the dependent variable, and focus on the coefficient on the indicator variable for the presence of dual holders, *non-CB dual holder*. The regressions employ the same set of control variables used in Table 4.

As we mentioned before, the necessary condition for non-CB dual holding is the presence of non-CBs in loan syndication. Table 3 indicates that non-CB participation is strongly associated with risky characteristics of loans and borrowers. As a result, these loans should naturally command higher spreads. To control for this effect, we include an indicator variable for non-CB participation or major participation for the full sample analysis. Results are reported in Columns (1) and (2) of Table 5.

In Column (1) of Table 5, the coefficient on the indicator variable for the presence of non-CB dual holders is  $-32.2$  bps (significant at the 1% level), suggesting that with everything else being equal, the presence of dual holders is associated with a lower loan yield spread. For a typical (median) loan in our

**Table 5**  
**Determinants of loan yield spreads**

Panel A: Pooled regressions

	All Loan Facilities				Non-CB Participation		Non-CB Major Participation	
	(1)		(2)		(3)		(4)	
	Coef	t-stat	Coef	t-stat	Coef	t-stat	Coef	t-stat
<i>non-CB participation</i>	43.043	15.11***						
<i>non-CB major participation</i>			36.059	11.75***				
<i>non-CB dual holder</i>	-32.194	9.38***	-29.664	6.53***	-23.790	6.00***	-18.004	3.30***
<i>facilityamt</i>	-5.048	4.17***	-5.264	4.27***	-12.646	6.16***	-11.422	4.84***
<i>maturity</i>	-0.245	0.16	-0.105	0.07	-0.553	0.20	-1.430	0.34
<i>secured</i>	59.619	23.04***	61.320	23.64***	61.242	12.75***	63.609	9.24***
<i>missingsecured</i>	16.273	7.73***	17.788	8.28***	22.106	5.31***	28.755	4.45***
<i>revolver</i>	-49.993	21.56***	-51.146	21.67***	-65.770	17.06***	-69.469	13.15***
<i>lbo takeover</i>	26.057	10.44***	26.434	10.37***	31.470	8.05***	34.889	6.41***
<i>numlender</i>	-9.334	5.43***	-5.811	3.42***	-14.244	4.36***	-20.007	5.33***
<i>assets</i>	-2.815	1.60	-3.044	1.70*	4.036	1.40	5.047	1.26
<i>lev</i>	54.922	7.32***	58.985	7.82***	27.555	2.39***	14.338	0.94
<i>b2m</i>	13.512	4.99***	13.369	4.91***	9.703	2.70***	6.990	1.67*
<i>growth</i>	-2.246	0.94	-2.459	1.01	-7.134	2.02**	-10.512	2.37**
<i>herfindahl</i>	2.453	0.56	0.846	0.19	2.861	0.43	-0.583	0.07
<i>inst</i>	0.065	0.01	-1.861	0.29	7.551	0.65	1.409	0.10
<i>stkratindadj</i>	-187.335	6.35***	-199.675	6.75***	-214.731	4.23***	-214.652	3.43***
<i>allman</i>	-6.146	6.00***	-5.845	5.65***	-7.695	4.06***	-8.418	3.24***
<i>sprate</i>	7.746	9.63***	7.859	9.66***	9.318	7.62***	10.460	6.14***
<i>notsprated</i>	103.107	9.57***	104.102	9.59***	129.668	7.71***	155.160	6.41***
<i>analyst</i>	-9.048	4.35***	-	4.78***	-12.720	3.23***	-13.000	2.81***
<i>stvol</i>	284.113	11.04***	300.560	11.56***	322.366	8.01***	334.094	6.68***
<i>ambud</i>	1.995	0.76	1.459	0.54	0.056	0.01	-3.751	0.59
<i>sp500</i>	9.817	1.65*	5.612	1.33	14.633	2.46**	13.399	1.621
#obs and adjusted-R <sup>2</sup>	13545	0.579	13551	0.573	5601	0.584	3293	0.553

(continued)

**Table 5**  
**Continued**

Panel B: Regressions with firm fixed effects

	All Loan Facilities		Non-CB Participation		Non-CB Major Participation	
	(1)	(2)	(3)	(4)	(4)	(4)
	Coef	Coef	Coef	Coef	Coef	t-stat
<i>non-CB participation</i>	31.162	10.44***				
<i>non-CB major participation</i>		24.324				
<i>non-CB dual holder</i>	-24.829	-24.309	-13.551	2.91***	-20.563	2.75***
<i>other controls included?</i>	Yes	Yes	Yes	Yes	Yes	
<i>#obs and R<sup>2</sup></i>	13545	13545	5601	0.554	3293	0.499

Definitions of all variables are provided in the Appendix. The dependent variable is the all-in-drawn loan yield spread in basis points, and the analysis is conducted at the loan facility level. Columns (1) and (2) employ the full sample. Columns (3) and (4) employ the subsamples of loan facilities that have non-CB participation and non-CB major participation, respectively. In columns (2) and (4), we also require at least one of the dual holders to be a major participant in the loan syndicate. All specifications are estimated by linear regression with year fixed effects. The *t*-statistics are based on standard errors clustered at the firm level. \*\*\*, \*\*, \* correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

sample, this represents an annual savings of \$437,920 in interest payments (= \$136 million  $\times$  32.2 bps). This finding complements results from two recent papers that examine the relation between banks' multiple roles and loan pricing. Ferreira and Matos (2009) find that the positive correlation between connectedness and loan pricing is absent when banks are direct shareholders of the borrowers. Focusing on the control rights of banks in companies in which they are also lenders, Santos and Wilson (2009) indicate that banks charge lower rates on loans when they also have voting stakes. Column (2) replaces *non-CB participation* with *non-CB major participation* (and dual holders are also restricted to being major participants), and results are qualitatively similar.

On the other hand, we find that non-CB participation in loan syndication is associated with significantly higher spreads (36.1–43.0 bps according to our model specification),<sup>18</sup> indicating that borrowers pay extra, conditional on observable loan and firm characteristics, when they resort to non-traditional lenders—maybe because these loans are subject to more adverse selection problems. The reduction in spread associated with dual holders must be interpreted as conditional on the presence of non-CBs in loan syndicates; that is, the simultaneous equity holdings in the borrowers by these institutions largely (though not completely) offsets the adverse pricing observed among loans funded by non-CBs.

The relationship between loan pricing and loan/borrower characteristics is intuitive and consistent with the literature regarding loan yield spread determination (Stulz and Johnson 1985; Dennis, Nandy, and Sharpe 2000). Large and revolving loans are associated with lower spreads, while secured loans and loans for risky purposes (LBOs and takeovers) have higher spreads.<sup>19</sup> Loans with a large lending syndicate are associated with lower spreads. In terms of borrower characteristics, firms with high leverage have to pay more to borrow, while high market-to-book firms enjoy lower spreads. Prior-year stock performance contributes to lower spreads as the rising market value of equity implies lowered leverage. Firms with lower bankruptcy risk, as summarized in the (higher) Altman Z-score excluding leverage (whereas leverage is included as a separate regressor), enjoy lower spreads as expected. The S&P rating also has a significant effect on the spreads, as firms with low ratings or no ratings generally have to pay higher spreads. Higher analyst coverage is associated with lower spreads, possibly due to greater information transparency. High return volatility is associated with higher spreads, reflecting the higher value of the default option held by equity holders.

<sup>18</sup> This result is consistent with the work by Nandy and Shao (2007), who examine the pricing of “institutional loans,” defined by the LPC as loan facilities designed to be sold to institutional investors. The institutional loans in their sample typically charge higher loan yield spreads (between 35 to 60 bps) than bank loans.

<sup>19</sup> Secured loans have higher spreads, reflecting the fact that collateral is often required when the loan is perceived as risky. Similar results are documented by Berger and Udell (1990) and Santos and Wilson (2009).

Parallel to Columns (1) and (2), Columns (3) and (4) of Table 5 assess the effect of dual holders by focusing on the subsample of loans with non-CB participation and major participation, respectively, the necessary conditions for dual holding. Again, the coefficients on the indicator variable *non-CB dual holder* in both columns are significant (at the 1% level) and take the value of  $-23.8$  and  $-18.0$  bps, respectively.<sup>20</sup>

Results in Table 5 suggest that having some shareholders simultaneously serve as creditors is associated with lower loan yield spreads. The interpretation of a causal effect is subject to the usual challenge of separating a treatment effect from a selection effect.<sup>21</sup> If the presence of dual holders is exogenous, then the negative coefficient on *dual holder* suggests that the simultaneous holding of debt and equity by some non-CBs alleviates the conflicts of interest between creditors and shareholders, leading to lower loan yield spreads (the treatment effect). Alternatively, if shareholders are more likely to become lenders when the loan is riskier (safer) due to the loan-deal heterogeneity observable to participating institutions, but unobservable to the public, then the causal effect of dual holders on spreads is under- (over-) estimated using simple regressions (the selection effect).

Before we conduct a formal analysis to separate these two effects, we run the loan yield spread regression on the subset of the S&P 500 firms, which are arguably the most transparent among public firms. If the information selection effect is present, it should be minimized among the S&P 500 firms. Out of our sample of 13,545 loan facilities, 3,088 facilities are taken out by the S&P 500 firms, 1,165 of which involve non-CB dual holders. Untabulated analysis shows that the coefficient on *non-CB dual holder* is  $-27.8$  bps (significant at the 1% level), indicating a significant and negative correlation between the presence of dual holders and loan yield spreads on a subsample with a relatively low level of information asymmetry. Moreover, the difference between this coefficient and the coefficients on *dual holder* from Columns (1) to (4) is not statistically significant using a two sample *t*-test.

To further examine the effect of the (relative) size of dual holders' equity stakes, we replace the indicator variable *non-CB dual holder* with measures of dual holders' influence as shareholders versus their influence as creditors. First, we use the total equity ownership by all dual holders in a borrower. Second, we create an indicator variable to flag cases where the total equity ownership by

<sup>20</sup> In unreported analysis, we have conducted sensitivity checks using dual holder defined at the bank holding company level. That is, a lender is classified as a dual holder if any affiliated institution (CB or non-CB) of the same bank holding company is a significant shareholder of the borrowing company. Not surprisingly, a majority (66%) of the loans in our sample have dual holders at the holding company level. However, the effect of dual holders is weakened to 20 bps in the reduction of the loan yield spread. Unreported analysis further shows that the effect of "incremental" dual holding at the parent level relative to the lender level is indistinguishable from zero, suggesting that the effect of simultaneous holdings of both equity and debt claims only matters when the distance between the lender and the equity holding institution is small.

<sup>21</sup> See Li and Prabhala (2007) for an overview of self-selection in corporate finance.

all dual holders in a borrower exceeds 5%. Third, we compute the ratio of total equity ownership by all dual holders in a borrower (either in dollar amounts or as a percentage) to their aggregate share of loan subscriptions measured in similar ways. In all cases, we find results consistent with those from our main specification; that is, higher equity holding by creditors is associated with lower costs of borrowing. Finally, we introduce an indicator variable for the presence of multiple non-CB dual holders and find that it does not change our findings qualitatively.

### 3.2 Dual holding by non-commercial banking institutions and stringency of loan covenants

So far, we have not considered another main aspect of debt contracting: covenants. Given that loan yield spreads and covenants are likely to be determined simultaneously, it is less than ideal to use the presence or tightness of covenants as control variables in the spread regression. In addition, the data on loan covenants are incomplete and are often difficult to standardize.<sup>22</sup> For simplicity, we construct a summary indicator variable, *covenant*, equal to one if there is at least one financial covenant in the loan contract, and zero otherwise. Common financial covenants include minimum quick and current ratios, minimum net worth, minimum return on assets and/or return on equity, minimum working capital, and maximum debt to worth.

In our sample, the unconditional correlation between *spread* and *covenant* is 0.17, indicating that firms with lower credit quality are subject not only to higher interest rates, but also to more disciplinary constraints. However, in unreported analysis, when we add other variables in Table 5 as controls, the marginal effect of *covenant* on loan yield spreads becomes  $-7.9$  bps (significant at the 1% level). This negative relationship indicates that loan interest rates and financial covenants are used as substitutes conditional on other loan and firm characteristics. Most importantly, in such a regression, the coefficient on *non-CB dual holder* is almost unchanged.

We are able to construct refined measures for the stringency of financial covenants in a subsample of 3,591 loan facilities. Following the method used in Chava and Roberts (2008) and Drucker and Puri (2009), we construct two variables: *CRslack* and *NWslack*. *CRslack* is defined as the loan borrower's current ratio at the fiscal year-end prior to the loan origination minus the minimum level allowed in the loan contract. *NWslack* is defined as the difference between the loan borrower's (tangible) net worth and the minimum level allowed by the loan contract normalized by the borrower's total assets. The correlation

<sup>22</sup> Covenants are not recorded for many loan facilities in DealScan. According to the Loan Syndications and Trading Association estimates, approximately 95% of loans to BBB-rated borrowers and 80% of loans to A-rated borrowers from 2003–2004 have financial covenants. In our sample, the corresponding numbers are 84% and 51%, respectively. In addition, there is ambiguity with respect to the measurement of covenants. For example, covenants that restrict the firm to a maximum debt-to-equity ratio may have different definitions of debt or equity.

between the indicator variable *non-CB dual holder* and the maximum of the two slack variables is weakly negative ( $-0.07$ ); however, the correlation with the minimum of the two slack variables is very similar. In an untabulated regression of any of the two slack variables (or the maximum/minimum of them) on *non-CB dual holder* and other control variables used in Table 5, the sign of the coefficient on *non-CB dual holder* varies, and the magnitude is far from being statistically significant. Overall, the low spreads associated with dual holders do not seem to come as a trade-off for more stringent covenants.

### 3.3 Endogenous dual holding by non-commercial banking institutions: fixed effects and two-stage regressions

To account for the possible selection effect, the processes of loan yield spreads and the presence of dual holders can be modeled as follows:

$$\begin{aligned} spread_i &= X_i\beta + \delta non-CB\ dual\ holder_i + \varepsilon_i, \\ non-CB\ dual\ holder_i^* &= X_i\gamma_1 + Z_i\gamma_2 + \omega_i, \\ non-CB\ dual\ holder_i &= 1, \text{ if } non-CB\ dual\ holder_i^* > 0; = 0, \text{ if otherwise.} \end{aligned} \quad (1)$$

In Equation (1),  $spread_i$  is the spread over LIBOR of the  $i$ th loan.  $X_i$  is a vector of covariates that include loan and firm characteristics. The coefficient of key interest is  $\delta$ , in front of the indicator variable *non-CB dual holder*. Variable *non-CB dual holder*<sup>\*</sup> indicates latent propensity of the presence of dual holders. It is a function of the  $X_i$  variable and an additional set of covariates  $Z_i$  that affect the propensity of dual holding but does not affect spreads directly other than through the effect of dual holders. The indicator variable *non-CB dual holder* is allowed to be endogenous in the sense that  $corr(\varepsilon, \omega) \neq 0$ . A positive (negative) association indicates that loans funded by shareholders are riskier (safer) based on unobservable heterogeneity. Thus, an estimate for  $\delta$  is upward (downward) biased if the endogeneity is not properly accounted for.

If the endogeneity of the residual,  $\omega$ , is associated with a firm-specific but time-invariant component in  $\varepsilon$ , that is, if  $\varepsilon_{i,t} = \theta_i + v_{i,t}$ , and  $corr(\theta, \omega) \neq 0$ , but  $corr(v, \omega) = 0$ , then  $\delta$  in Equation (1) could be consistently estimated using the conventional linear regressions with firm fixed effects provided that there is within-firm variation in the indicator variable *non-CB dual holder* (a condition that is satisfied). Panel B of Table 5 repeats the exercise in Panel A with the additional firm fixed effects. For the economy of space, only the coefficients on the key variables of interest are reported, though the same set of control variables are included in the regression together with the year fixed effects.

Results in Panel B of Table 5 indicate that when a firm receives a loan from lenders that are also shareholders, the loan yield spread is typically 13–25 bps lower than a similar loan of the same firm without dual holder participation. The magnitude is comparable to that reported in Panel A, and is statistically significant at the 1% level for all specifications. The significant result also holds for the subsample of the S&P 500 firms (untabulated). The consistency

in the results between the two panels of Table 5 suggests that the negative association between the presence of dual holders and loan yield spreads is not driven by unobserved heterogeneity at the firm level.

Naturally, questions arise about the possibility that the unobserved heterogeneity among borrowers is time varying. To allow for such a possibility, we resort to the treatment regression using the maximum likelihood estimator developed by Maddala (1983, Chapter 5), where *non-CB dual holder* is treated endogenous. We realize that both *non-CB (major) participation* and *non-CB dual holder* could be potentially endogenous (in Columns (1) and (2) of Table 5). However, we are not able to come up with two different sets of instrumental variables to separate the effect of non-CB (major) participation from that of their presence as dual holders in the full sample. For this reason, we focus on the subsamples conditional on non-CB (major) participation, and the results regarding dual holding loans should be interpreted as relative to other loans within the subsamples.

Our choice of the instrumental variable is theoretically as well as econometrically driven. Trading liquidity is a key determinant for institutional equity ownership, and has explanatory power for the presence of dual holders conditional upon non-CB participation. In contrast, the liquidity-related characteristics that make a firm more or less attractive for institutional equity investing, conditional on non-CB participation and loan and firm characteristics, should not directly affect the loan yield spread. They could, however, indirectly affect loan pricing through the effect of equity holding (which, combined with non-CB (major) participation in the loan, becomes dual holding).

The literature has documented that stock trading liquidity is positively correlated with past returns which, in turn, affect dual holder participation. To disentangle liquidity from momentum, we use the residual of *amihud* from its projection on *stketindadj* (industry-adjusted stock returns), instead of the original *amihud* measure, as our instrumental variable for non-CB dual holders.

The results from estimating Equation (1) using the treatment regression method on the two subsamples of non-CB participated and major participated loans are reported in Table 6. The identification relies on both the instrument and the non-linearity of the propensity of dual holding. The coefficient on *non-CB dual holder* captures the effect of the presence of at least one dual holder on the loan yield spread, taking into account the possible selection of loan deals by the non-CB dual holder. The effect is, again, negative, and the magnitude is now in the 68–87 bps range (significant at the 1% level), which is even larger than that of the coefficients in Table 5 without controlling for the selection effect. Such a difference indicates that  $\rho = \text{corr}(\varepsilon, \omega) > 0$ , where  $\varepsilon$  and  $\omega$  are disturbances in loan yield spreads and in the propensity of the presence of dual holders, respectively, as specified in Equation (1). The exogeneity test rejects the null hypothesis that  $\rho = 0$  at the 1% level.

Results in Table 6 indicate that there is a selection effect associated with dual holding. In the sample of loans with non-CB participation, dual holders tend

**Table 6**  
**Determinants of loan yield spreads—treatment regression**

	(1) Non-CB Participation		(2) Non-CB Major Participation	
	Coef	t-stat	Coef	t-stat
<i>non-CB dual holder</i>	-67.846	8.08***	-87.124	7.26***
<i>facilityamt</i>	-12.216	6.01***	-11.125	4.65***
<i>maturity</i>	-0.959	0.34	-1.417	0.33
<i>secured</i>	58.604	11.72***	61.929	8.50***
<i>missingsecured</i>	20.792	4.83***	34.434	4.86***
<i>revolver</i>	-64.262	16.82***	-69.338	13.22***
<i>lbotakeover</i>	28.803	7.25***	34.730	6.31***
<i>numlender</i>	-8.179	2.31**	-19.235	4.91***
<i>assets</i>	5.040	1.75*	8.577	2.15**
<i>lev</i>	25.466	2.21**	11.699	0.77
<i>b2m</i>	8.770	2.47**	5.721	1.42
<i>growth</i>	-7.080	2.07**	-8.499	2.02**
<i>herfindahl</i>	2.990	0.45	0.952	0.11
<i>inst</i>	15.656	1.40	4.104	0.29
<i>stketindadj</i>	-195.288	3.84***	-187.845	2.99***
<i>altman</i>	-8.014	4.19***	-9.073	3.44***
<i>sprate</i>	8.430	6.96***	9.325	5.53***
<i>notsprated</i>	117.427	6.94***	138.605	5.69***
<i>analyst</i>	-10.436	2.78***	-11.970	2.68***
<i>stkvoll</i>	312.864	7.94***	324.903	6.53***
<i>sp500</i>	18.067	2.92***	19.387	2.12**
Endogeneity test (Chi-sq(1) statistic reported):				
<i>rho</i>	0.30	28.77***	0.43	29.5***
<i>lamda</i>	27.13		43.12	
<i>#obs</i>	5601		3293	

Definitions of all variables are provided in the Appendix. The dependent variable is the all-in-drawn loan yield spread, and the analysis is conducted at the loan facility level. All specifications are estimated by treatment regressions with year fixed effects. Residuals obtained from regressing *amihud* on *stketindadj* serve as an instrument. Columns (1) and (2) employ the subsamples of loan facilities that have non-CB participation and non-CB major participation, respectively. In column (2), we also require at least one of the non-CB dual holders to be a major participant in the loan syndicate. The *t*-statistics are based on standard errors clustered at the firm level. \*\*\*, \*\*, \* correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

to select loans that are riskier conditional on observable loan and borrower characteristics. That is, these loans would otherwise command even *higher* loan yield spreads (after controlling for observable characteristics) had there been no involvement of dual holders. To the extent that the treatment regression framework is valid, such a selection effect makes the interpretation of a causal effect stronger as it renders the effect of *non-CB dual holder* underestimated using an OLS regression (as in Table 5). It provides further support for the incentive alignment hypothesis in that dual holders should be expected to hold risky loans that are most vulnerable to the agency costs of debt.

Given that the practice of dual holding is dominated by a handful of players, we conduct two robustness checks to ensure that the effects documented in Table 6 are not due to idiosyncratic behaviors of a few institutions. First, we repeat the regression by eliminating the top five dual holders one at a time. Second, we add the dual holder fixed effects to the same specification. Results are qualitatively the same under these variations.

### 3.4 Comparison between commercial banks and non-commercial banking institutions

Though not the focus of this study, we analyze the effect of dual holding by commercial banks for comparison purposes, and present the results in Table 7. Column (1) repeats the analysis shown in Column (1) of Table 4, and Columns (2) and (3) replicate Columns (1) and (3) of Table 5, where *non-CB dual holder* in the earlier tables is replaced with *CB dual holder* in Table 7. In the final column of Table 7, we present both *CB dual holder* and *non-CB dual holder* in one regression.

Column (1) of Table 7 shows that CB dual holders prefer unsecured revolving loans, loans not for risky LBO and takeover purposes, and borrowers with high growth. Symmetrical to the results shown in Table 5, loans with only CB participation tend to command lower loan yield spreads. Conditionally, the further presence of CB dual holders is associated with lower loan yield spreads in most specifications, consistent with Santos and Wilson's (2009) finding that banks offer an interest rate discount when they lend to borrowers in which they have a voting stake. However, the magnitude (6–15 bps) of the effect of CB dual holders is on the order of one-quarter to one-half of that of non-CB dual holders. Based on the regression reported in Column (4) in Table 7, we are able to test the difference between the coefficients on *CB dual holder* and *non-CB dual holder*, and reject the null that they are equal at the 5% significance level.

Given that our classification of dual holders incorporates equity holdings at the subsidiary level, it would be interesting to examine whether the same type of equity-holding subsidiaries (e.g., asset management companies) have different effects on loan yield spreads when they are affiliated with CB lenders versus with non-CB lenders. Untabulated results show that when an asset management subsidiary of a non-CB lender is a significant equity holder of the same borrowing firm, the loan yield spread is on average 15 bps lower. In contrast, the spread is 6 bps higher if the equity-holding subsidiary is affiliated with a CB lender. Both coefficients are significant at the 5% level, and the latter results are consistent with Ferreira and Matos' (2009) finding that when a bank's subsidiary owns equity in firms to which the bank lends, the loan yield spreads tend to be higher.

The overall evidence about the effects of CB dual holders is mixed. The contrast between CB and non-CB dual holders can be due to the differences in both the loan selection processes by the two groups of institutions and the nature of their equity holdings. For example, due to regulatory constraints, a large percentage of the equity holdings reported in 13F filings by commercial banks are in fiduciary capacity (such as trust accounts), whereas the incentives could be quite different as compared to direct equity holdings by other institutions. We refer the reader to Ferreira and Matos (2009) and Santos and Wilson (2009) for in-depth discussions of banks' ownership of and control over borrowers, and the resulting effects on loan pricing.

**Table 7**  
**Commercial bank dual holding**

	Determinants of CB Dual Holding (1)			Effects of CB Dual Holding (2)			(3) Subsample: Only CB Participated Loans			CB vs. Non-CB Dual Holding (4)		
	All Loan Facilities			All Loan Facilities sample			Only CB Participated Loans			All Loan Facilities		
	Coef	t-stat	dPr/dx	Coef	t-stat		Coef	t-stat		Coef	t-stat	
<i>only CB participation</i>				-32.894	11.48***		-14.767	5.67***		-40.612	12.92***	
<i>CB dual holder</i>				1.820	0.76					-6.424	2.64***	
<i>non-CB dual holder</i>										-34.102	9.60***	
<i>facilityamt</i>	0.051	2.09**	1.09%	-4.905	4.02***		-0.886	0.71		-4.950	4.10***	
<i>maturity</i>	-0.027	1.12	-0.57%	0.310	0.20		-0.827	0.52		-0.248	0.16	
<i>secured</i>	-0.286	5.29***	-6.01%	60.976	23.51***		57.782	22.08***		59.409	22.99***	
<i>missingsecured</i>	0.061	1.34	1.32%	17.407	8.14***		12.120	6.03***		16.309	7.75***	
<i>revolver</i>	0.211	5.14***	4.20%	-50.660	21.61***		-35.909	14.90***		-49.889	21.50***	
<i>lbo takeover</i>	-0.165	3.26***	-3.31%	27.009	10.61***		22.773	7.69***		25.968	10.42***	
<i>numlender</i>	0.116	3.67***	2.45%	-11.537	6.29***		-4.532	2.48**		-8.453	4.72***	
<i>assets</i>	-0.009	0.29	-0.20%	-3.482	1.94*		7.055	4.13***		-2.669	1.51	
<i>lev</i>	-0.351	2.32**	-7.43%	57.427	7.61***		72.130	8.75***		54.764	7.29***	
<i>b2m</i>	-0.016	0.29	-0.34%	14.124	5.22***		18.223	6.25***		13.401	4.95***	
<i>growth</i>	-0.101	1.76*	-2.14%	-2.606	1.08		3.460	1.29		-2.235	0.94	
<i>herfindahl</i>	-0.169	2.06**	-3.58%	1.925	0.43		2.812	0.62		2.254	0.52	
<i>inst</i>	0.706	5.63***	14.96%	-1.838	0.28		-3.112	0.52		0.923	0.14	
<i>stkrctindadj</i>	1.740	3.14***	36.85%	-196.861	6.60***		-140.275	4.72***		-186.769	6.33***	
<i>aliman</i>	0.028	1.42	0.60%	-5.976	5.77***		-4.650	4.43***		-6.104	5.95***	
<i>sprate</i>	-0.018	1.53	-0.38%	7.995	9.78***		6.067	8.04***		7.700	9.59***	
<i>notsprated</i>	-0.158	0.99	-3.35%	106.221	9.70***		78.043	7.77***		102.421	9.53***	
<i>analyst</i>	0.060	1.56	1.27%	-10.038	4.73***		-6.044	3.31***		-8.942	4.31***	
<i>stfvol</i>	-2.698	-2.80***	-56.52%	296.339	11.39***		227.073	8.49***		284.183	11.04***	
<i>amihud</i>	3.580	3.50***	18.12%	0.950	0.36		3.055	1.23		2.160	0.82	
<i>sp500</i>	-0.023	0.31	-0.48%	5.456	1.31		2.463	0.58		7.114	1.73*	
#obs and pseudo-R <sup>2</sup>	13545	0.174		13545	0.573		7944	0.556		13545	0.579	
% (Dep Var = 1)	20%											

Definitions of all variables are provided in the Appendix. Column (1) reports the results of a Probit regression in which the dependent variable is an indicator variable for the occurrence of dual holding of debt and equity in the same borrowing company by CB lenders. dPr/dx represents incremental change in predicted probability change for one unit of change in the regressor, while holding other regressors at their respective mean levels. Columns (2-4) report the results of OLS regressions in which the dependent variable is the all-in-drawn loan yield spread in basis points. In columns (3), we run the OLS regression on the only CB-participated subsample. Year fixed effects have been added to all the models. The *t*-statistics are based on standard errors clustered at the firm level. \*\*\*, \*\*, \* correspond to statistical significance at the 1%, 5%, and 10% levels, respectively.

## 4. Explaining the Effects of Dual Holders

In this section we conduct additional tests that help answer the following important question: Are the lower loan yield spreads associated with the presence of non-CB dual holders justified by the improvement in the borrowers' credit quality and operating performance after loan origination?

### 4.1 Investment horizons of non-commercial banking institutional dual holders

The incentive alignment hypothesis (or the treatment effect) posits that dual holders have the incentive to align the interest between shareholders and debt holders. Such an incentive should be stronger if the dual holders have a relatively long horizon in the firm both as lenders and as shareholders. Prior literature has associated a longer investment horizon with a higher propensity for monitoring. For example, [Gaspar, Massa, and Matos \(2005\)](#) conclude that institutional investors with low turnover portfolios are more likely to exert influence on corporate acquisition decisions. [Chen, Harford, and Li \(2007\)](#) report that longer horizons make the cost-benefit calculation more favorable for monitoring than for trading. Using a sample of hedge fund activism events, [Brav, Jiang, Partnoy, and Thomas \(2008\)](#) find that hedge funds tend to hold significant stakes longer in the target company when they launch aggressive activism.

While the literature has focused on investment horizons on the equity side, for dual holders, the same issue is applicable from both the debt and the equity sides. Evidence regarding non-CB dual holders' interaction with the borrowing company as lenders is provided in Table 8, Panel A. We compare the intensity of the lending relationship between the borrowing firm and two types of lenders (non-CB dual holders and other non-CB lenders who are not dual holders) before and after the loan deal. The intensity of the lending relationship is measured in terms of both the number of deals and the dollar amount involved. Specifically, we calculate the total number of loan facilities (or the total dollar amount of these facilities) in which the same lender participates before and after the current loan deal date, scaled by the borrower's total newly initiated number of loans (amount of loans) during the same period. Since our information on loan deals extends only to February 2007, we exclude loan deals initiated in 2006 for the post-deal analysis to mitigate the data truncation problem. We compute this intensity measure separately for dual holders and non-dual holders. Given that each loan facility has multiple lenders, we first take the average at the loan facility level before averaging over all facilities, and then conduct a comparison between dual holders and non-dual holders.

Results in Panel A of Table 8 demonstrate that before the current loan deal date, dual holders in the current facility generally participate in 44.0% of all the loans issued by the same company. The same measure for non-dual holders is 37.9%. In the post-deal period (up to February 2007 and excluding loans made in 2006), the intensity measure takes the value of 61.3% of all the loans issued

**Table 8****Investment horizon of non-commercial banking institution dual holders**

Panel A: Comparing lending relations of dual holders and non-dual holders

	Dual Holders	Non-Dual Holders	Difference	t-stat
Prior #Deals	0.440	0.379	0.061	7.48
Prior Amount	0.482	0.412	0.070	8.26
Post #Deals (Ex. 2006 loans)	0.613	0.496	0.117	12.83
Post Amount (Ex. 2006 loans)	0.602	0.492	0.110	11.54

Panel B: Dual holder equity investment horizon

	25th percentile	Median	75th percentile	mean
Before Loan Deal	6	13	22	18.321
After Loan Deal	4	9	15	10.557
Total Holding Period	16	27	34	28.878

Panel C: Comparing equity investment horizon of creditors and non-creditors

	Creditors	Non-Creditors	Difference	t-stat
Before Loan Deal	18.321	15.704	2.617	4.08
After Loan Deal	10.557	9.754	0.803	2.75
Total Holding Period	28.878	25.458	3.420	5.06

Panel A compares the intensity of the lending relationship between the borrowing firm and two types of lenders: non-CB dual holders and non-CB non-dual holders. Specifically, we calculate the total number of loan facilities (or the total dollar amount of these facilities) in which the same lender participates before and after the current loan deal date, scaled by the borrower's total number (amount) of newly initiated loans during the same period. The 2006 deals are excluded from post-period calculation. Panel B reports the investment horizon (in quarters) between the first time that a non-CB dual holder's quarter-end equity position in the company rises to be significant (\$2 million or \$5 million in the case of borrowers' parent firm in 2006 dollars or 1% of the borrowing firm) and the loan deal date, between the loan deal date and the first time that the same institution's quarter-end position falls below to be significant, and the total duration. Panel C compares the equity investment horizon by the non-CB dual holder in the borrower vis-à-vis the same institution's holding in a similar company (matched by market capitalization) with no concurrent lending relationship.

by the same company for dual holders versus 49.6% for non-dual holders. The differences in both the pre- and post-deal periods are significant at the 1% level. Using the dollar amount measure yields very similar results.

Another measure of the lenders' investment horizon in syndicated loans is the sale of loans by the syndicate members to the secondary market. According to the LPC, U.S. corporations in 2007 raised about \$1.89 trillion through loan syndication. After syndication, loans are traded in a rapidly growing secondary market. The U.S. secondary loan market trading volume reached \$342.0 billion in 2007 from a mere \$8.0 billion traded in 1991, a compound annual growth rate of 26.5%.

To identify loans that are sold in the secondary market, we use the LSTA Mark-to-Market Pricing database, a dataset of daily secondary market loan quotations gathered by third-party providers (LPC and LSTA) from relationships with over 30 leading dealers and traders. The unit of observation in the database is a pair between a loan facility and a quotation date. The data, however, does not provide us with the identities of loan sellers from the syndicate. Therefore, we cannot trace out loan sales by individual lenders. Instead, we are only equipped with the knowledge of whether a particular loan ends up trading in the secondary market. The sample period is 1998–2004 with available data.

Gande and Saunders (2006) provide an analysis on the secondary market for loans using the same data.

We find that loans of larger borrowers with higher leverage, lower book-to-market, higher growth, higher institutional equity ownership and analyst coverage, higher past stock returns, and lower Altman Z-scores are more likely to appear in the secondary market (untabulated). These features are broadly in line with findings of papers that specifically examine loan sales, such as Kamstra, Roberts, and Shao (2006) and Drucker and Puri (2009).

More importantly, the frequency of being traded in the secondary market is lower for non-CB participated loans with dual holders (14%) than for non-CB participated loans without dual holders (21%), and the difference is statistically significant. In a regression (untabulated) that examines the determinants of loan sales, the coefficient on *non-CB dual holder* is significant and negative (at the 1% level) on its own or with the other usual controls. The limited evidence indicates that dual holders may be less likely (or at least no more likely) to resell their loans to the secondary market.

On the equity side, using information from the Thomson Financial Ownership database (updated to the end of 2007), we investigate the length of time over which dual holders have significant equity positions in the borrower before and after the loan deal. For each loan facility with at least one dual holder (which, by construction, takes a significant equity position; that is, at least 1% or two million dollars of equity in the borrower, or five million dollars in the borrower's parent company), we go back in time to find the earliest quarter-end when the dual holding institution's position in the company becomes significant. Similarly, we go forward in time to find the latest quarter-end up to when the position remains significant. We call these two quarters  $q_1$  and  $q_2$  (i.e., the institution's equity holding falls below being significant in quarters  $q_1 - 1$  and  $q_2 + 1$ ). Then,  $q_2 - q_1 + 1$  is the total number of quarters surrounding the loan origination date in which the dual holder has a continuous significant equity position in the borrower. We then split this measure into holding periods before and after the loan origination.

Panel B of Table 8 indicates that the median (average) holding period by the dual holders before the loan deal is 13 (18) quarters and that after the loan deal is 9 (11) quarters.<sup>23</sup> To gain some perspective regarding the investment horizons of dual holders on the equity side, we form comparison groups by selecting, among all portfolio companies in which a dual holding institution has significant equity positions during the quarter of loan origination, the company that is closest in market capitalization to the borrowing firm with which our institution is the dual holder. Panel C of Table 8 shows that non-CBs tend to hold equity positions in companies in which they are also creditors for a

<sup>23</sup> The holding period after the deal could be underestimated if it is censored at the end of 2007. If we exclude the subsample of loan facilities that were initiated in 2006, the median/average post-deal holding period increases by about 0.8 quarter.

significantly longer period of time (by 3 quarters) than those in which they are merely shareholders. The difference remains virtually the same if we exclude loan facilities initiated in 2006 to mitigate the data truncation problem.

Results in Table 8 indicate that dual holding institutions tend to have long-term relationships with firms of which they are both creditors and shareholders. Combined with the evidence from other papers on investment horizon and institutional monitoring, the results suggest that the lower spreads of loans funded by dual holders can at least, to some extent, be attributed to the monitoring effort of dual holders who could benefit from their own efforts over a longer investment horizon.

The alternative hypothesis ascribes superior information as the primary motivation for dual holding. Superior (non-public) information about a firm's performance, by definition, should have a zero mean conditional on public information. Therefore, it should not have a systematic bias toward long positions. Investors with superior information about a firm might be able to profit from more frequent trading or changing positions in that firm (Bushee and Goodman 2007), but should not be expected to have a significantly longer holding period in that firm.

To further assess the possibility of informed trading (on the equity side), we partition the non-CB (major) participation sample by whether non-CB dual holders are present and examine buy-and-hold abnormal stock returns (relative to industry-median returns) during the two years before and the two years after loan origination. While companies with dual holding lenders experience significantly better stock returns during the two years before the new loans (consistent with the results in Table 4), the difference disappears when the post-loan stock returns are compared. The lack of superior stock performance for companies with dual holders after loan origination does not support the presence of informed stock trading arising from dual holding.<sup>24</sup>

## 4.2 Borrower risk-shifting and operating performance after loan origination

In this section, we examine whether the lower yield spreads on loans with non-CB dual holders are justified by the reduced borrower risk-shifting. It is natural to expect that the credit quality of firms would deteriorate, at least temporarily, after assuming new loans. The deterioration could persist if the increase in leverage encourages managers and shareholders to take some self-interested actions at the expense of creditors. It would be interesting to see whether loans with dual holders are associated with smaller unfavorable changes in the borrower's creditworthiness. To this end, we use the following differences-in-differences regression specifications.

<sup>24</sup> Massa and Rehman (2008) and Ivashina and Sun (2009) provide evidence of information spillover from the debt side to the equity side under specific circumstances (mutual fund trading or loan amendment). Such a relation is not a significant force in our setup.

Let  $d_{t+j}^1$ ,  $j = -2, -1, 0, 1, 2$ , be the indicator variable for a firm-year where  $j =$  years before/after the firm receives a syndicated loan and there is at least one non-CB dual holder among the lenders. Let  $d_{t+j}^2$ ,  $j = -2, -1, 0, 1, 2$ , be the indicator variable for a firm-year where  $j =$  years before/after the firm receives a syndicated loan and there is no non-CB dual holder.<sup>25</sup> In the regression,

$$y_{i,t} = \sum_{j=-2}^2 \beta_j^1 d_{t+j}^1 + \sum_{j=-2}^2 \beta_j^2 d_{t+j}^2 + \lambda \ln(MV_{i,t}) + \alpha_{SIC3} + \alpha_t + \varepsilon_{i,t}, \quad (2)$$

where industry (at the three-digit SIC Code level) and year fixed effects are included and firm size (log market capitalization) are controlled for,  $\beta_j^1$  represents the difference in the dependent variable (to be discussed later) for firms that are  $j$  years after (negative values mean “before”) a loan with dual holders and that for control firms in the same year-industry combination and of similar size, but without any loan. Similarly,  $\beta_j^2$  represents the difference in the dependent variable for firms that are  $j$  years after a loan without involving any dual holders and that for control firms in the same year-industry and of similar size, but without any loan. To make sure that the control firms are comparable to the new loan receiving ones, we only include in Equation (2) firms that appear in the DealScan database at least once during the period from January 1981 to February 2007 (the coverage of the database at the time of data retrieval); that is, the control firms are eligible for syndicated loans, but do not receive a new loan during the  $[t - 2, t + 2]$  window defined by the new loan receiving firms.

In addition to the coefficients from Equation (2), we also examine the differences-in-differences,  $\beta_{t+j}^1 - \beta_{t+j}^2$  (the differential effects of dual holders, year by year, relative to other loan receiving firms),  $\beta_{t+2}^1 - \beta_{t-2}^1$  (the before-after difference of loan receiving firms with dual holders), and  $\beta_{t+2}^2 - \beta_{t-2}^2$  (the before-after difference of loan receiving firms without dual holders). Such differences could be tested using the estimates and the variance-covariance matrices from Equation (2).

The most natural summary indicator for a firm’s creditworthiness is the Altman Z-score. Given that the leverage ratio would go up mechanically after a firm takes a new loan, we focus on a variant to the Altman Z-score that excludes the leverage component. Results are reported in Panel A of Table 9. Two interesting empirical regularities emerge. First, loan receiving companies with dual holders have an average Altman Z-score (excluding leverage) that is 0.24 lower than those without dual holders at the end of year  $t - 2$ . The difference is both statistically (at the 1% level) and economically significant (the sample average (median) is 1.88 (1.87)). Second, loan receiving companies see an overall deterioration in the credit score after the loan receiving year. The

<sup>25</sup> Results are qualitatively the same if we define the  $d^2$  dummies for firms that receive only CB-participated loans, but without any dual holder.

difference between year  $t + 2$  and  $t - 2$  is  $-0.07$  (significant at the 1% level), consistent with the findings of Altman and Kao (1992). In contrast, borrowers with dual holders see no further deterioration in their credit score during the two-year period after loan origination. These two pieces of evidence suggest that borrowers with non-CB dual holders are riskier than other borrowers at loan origination, but experience less deterioration in credit quality afterward.

Next, we employ a “risk-shifting” proxy to examine changes in the riskiness of the borrower’s debt after loan origination, “distance-to-default.” The measure combines three key credit issues: 1) the value of the firm’s assets; 2) its business and industry risk; and 3) its leverage. More specifically, the distance-to-default refers to the number of standard deviation decreases in firm value before the firm is in default. This measure is motivated by Merton’s (1974) bond pricing model populated by Moody’s KMV, and is now a standard measure for default risk. We estimate distance-to-default for each firm at each year-end following the estimation procedure in Vassalou and Xing (2004). A larger distance-to-default indicates a lower likelihood of default.

Panel B of Table 9 reports that firms borrowing from non-CB dual holders have significantly smaller values of distance-to-default than other borrowers at the end of year  $t - 2$ . The difference is 0.17, as compared to the sample average (median) of 2.53 (2.25). Two years after the new loans, the difference shrinks to 0.02, and is no longer statistically significant. This is because firms borrowing from dual holders experience significant improvement in their distance-to-default in the post-loan years as compared to the pre-loan period, while the same does not happen to firms borrowing from pure creditors (who are not shareholders). Our finding is consistent with Sundaram and Yermack (2007), who confirm that CEOs with more “inside debt” in their own firms (in the form of defined benefit pensions and deferred compensation) relative to their equity holdings operate more conservatively using the same distance-to-default measure.

If the lower loan yield spread is due to better incentive alignment, then it should lead to value creation due to the lower cost of capital. Moreover, some value creation may accrue to the shareholders since the dual holders, other things being equal, have a stronger incentive to enhance the equity value of the borrower than pure creditors. Panel C of Table 9 illustrates the temporal evolution of return on equity (ROE, the ratio of net income to the book value of equity) as a proxy for the operating performance on the equity side. While ROE tends to deteriorate shortly after a firm receives a new loan (mostly because of the drop in net income due to the increase in interest payments), the deterioration is only significant among the subsample of borrowers without non-CB dual holders, while no evidence of deterioration is present in the subsample with non-CB dual holders.

In unreported analysis, we do not find a significant differential effect between the two subsamples using the return on assets measure (ROA, defined as the ratio of earnings before interest, taxes, depreciation, and amortization or

**Table 9****The before-after change in credit quality of borrowers with non-CB dual holders**

Panel A: Altman score (ex. Leverage) (#obs: 43,405, 1985–2006)

	(1) Loans w/ Dual Holders		(2) Other Loans		(1) – (2)	
	Difference	t-stat	Difference	t-stat	Dif-in-Dif	t-stat
t-2	-0.085	-2.91	0.153	8.57	-0.238	-7.44
t-1	-0.072	-2.17	0.179	8.70	-0.251	-7.28
t	-0.159	-4.71	0.118	5.48	-0.277	-7.99
t+1	-0.119	-3.39	0.105	4.67	-0.224	-6.28
t+2	-0.109	-3.08	0.085	4.17	-0.194	-5.29
Dif-in-Dif: (t+2) - t	0.051	1.00	-0.033	-1.08		
Dif-in-Dif: (t+2)-(t-2)	-0.024	-0.55	-0.068	-2.60		

Panel B: Distance-to-default (#obs: 45,819, 1985–2006)

	(1) Loans w/ Dual Holders		(2) Other Loans		(1) – (2)	
	Difference	t-stat	Difference	t-stat	Dif-in-Dif	t-stat
t-2	-0.183	-6.45	-0.014	-0.98	-0.170	-5.65
t-1	-0.194	-6.16	-0.025	-1.61	-0.169	-5.36
t	-0.186	-5.68	-0.028	-1.80	-0.159	-4.80
t+1	-0.147	-4.08	-0.019	-1.20	-0.127	-3.51
t+2	-0.036	-0.95	-0.013	-0.80	-0.023	-0.59
Dif-in-Dif: (t+2) - t	0.150	2.89	0.015	0.67		
Dif-in-Dif: (t+2)-(t-2)	0.148	3.23	0.001	0.06		

Panel C: Return on equity (#obs: 48,575, 1985–2006)

	(1) Loans w/ Dual Holders		(2) Other Loans		(1) – (2)	
	Difference	t-stat	Difference	t-stat	Dif-in-Dif	t-stat
t-2	-0.035	-2.09	0.043	6.80	-0.078	-4.41
t-1	0.009	0.84	0.033	4.21	-0.024	-1.95
t	-0.012	-1.04	0.018	2.31	-0.030	-2.35
t+1	-0.017	-1.37	-0.004	-0.44	-0.013	-1.00
t+2	-0.023	-1.84	-0.035	-3.50	0.012	0.83
Dif-in-Dif: (t+2) - t	-0.011	-0.64	-0.054	-4.06		
Dif-in-Dif: (t+2)-(t-2)	0.012	0.61	-0.078	-6.76		

Panel D: Spread on credit derivative Swaps (#obs: 2,322, 2001–2007)

	(1) Loans w/ Dual Holders		(2) Other Loans		(1) – (2)	
	Difference	t-stat	Difference	t-stat	Dif-in-Dif	t-stat
t-2	0.149	1.85	-0.048	-0.48	0.197	1.70
t-1	0.131	1.70	0.076	0.74	0.056	0.53
t	0.153	2.09	0.086	0.98	0.067	0.71
t+1	0.098	1.40	0.098	1.35	0.000	0.00
t+2	0.035	0.59	0.147	2.25	-0.112	-1.32
Dif-in-Dif: (t+2) - t	-0.118	-1.28	0.061	0.55		
Dif-in-Dif: (t+2)-(t-2)	-0.114	-1.08	0.195	1.77		

This table examines the difference in various credit quality measures between new loan-receiving companies (with and without non-CB dual holders) and comparable companies. Comparable companies are drawn from the universe of companies that ever appear in the DealScan database from 1981 to 2007, and are matched based on year, industry, and size. Also reported are the differences-in-differences of each type of borrowers across time, and that between the two types of borrowers. The time horizon is from two years before the loan origination year (t-2) to two years afterward (t+2). Standard errors are clustered at the firm level. Our credit quality measures are Altman score (excluding leverage) and distance-to-default, and CDS spread (using the five-year standard contract), measured in logarithm, and our operating performance measure is return on equity (ROE).

operating income to assets). Combined results regarding ROA and ROE indicate that the presence of non-CB dual holders has limited impact on the drivers of operating cash flows (such as increase in sales or reduction in operational costs), but contributes to lower borrowing costs, which improves the bottom line. This is consistent with our incentive alignment hypothesis in that dual holders have the incentive to monitor managerial actions that expropriate creditors after taking on new loans, which justifies lower *ex ante* borrowing costs.

Neither do we find a significant differential effect between the two subsamples regarding stock returns during the two years after loan origination. Detection of abnormal stock returns usually relies on an accurately identified event window during which new value-relevant information becomes publicly known. Such a window is hard to define in the context of loan syndication because stock prices might reflect information about loan terms before the official loan origination date given the syndication process.<sup>26</sup> Moreover, the lack of *ex post* superior stock returns associated with dual holders refutes the information hypothesis, which posits that lower loan yield spreads are primarily due to dual holders' superior information.

#### 4.3 Information or monitoring: further evidence from credit default swaps

Tests in the previous section and results in Panels A and B of Table 9 deliver a coherent message. Companies with equity-holding lenders tend to be riskier before issuing new loans, but experience less borrower risk-shifting after assuming the new loans. Thus, there will be less deterioration in the companies' credit quality. On their own, these tests do not strictly disentangle the predictive information story (i.e., dual holders have an informational advantage in predicting the future evolution of the borrower's credit quality) from the incentive alignment hypothesis (i.e., dual holders are more willing to internalize the potential harm on creditors from the opportunistic behavior of the shareholders).

To further separate these two effects, we resort to the credit default swaps (CDS) market. A CDS is a contract written on a firm that issues publicly traded bonds. It represents a sequence of payments paid in return for protection against the losses in the event of default. CDS spreads are usually taken as the insurance premium for the senior unsecured debt of the issuer, and, hence, the general creditworthiness of the issuer. Prior work has demonstrated that prices on CDS contracts are more informative about the issuing companies' credit quality than the prices of bonds (Blanco, Brennan, and Marsh 2005; Longstaff, Mithal, and Neis 2005).

There are several advantages to using the CDS spreads as a measure of a firm's general creditworthiness that are relevant to syndicate loan lenders. First,

<sup>26</sup> It usually takes two to six months for a syndicated loan to finish the process from the pre-mandate phase to completion.



**Figure 3**  
The aggregate time series of CDS premium over LIBOR

due to the prevalence of cross-default and cross-acceleration clauses in firms' debt contracts, the default spreads on the CDS contracts can be directly informative about the default probability of the same borrower's syndicated loans. Second, CDS pricing is a clean measure of the spread for bearing a firm's default risk that investors require by virtue of the homogeneity of the contracts. In contrast, prices and yields on loans or bonds need to be assessed together with a diversity of coupon structures, embedded options, and covenant restrictions, all of which can be endogenous to the debt contracts.

One of the authors purchased the price information for CDS contracts for 500 firms for the period of January 2001 to December 2007 from Markit, a leading independent source of CDS pricing. The 500 firms include all the 139 firms that are in the intersection of Markit coverage and our sample firms that have dual holders at least sometime during the period 2001–2006. Other firms serve as the control sample. There are usually multiple CDS contracts traded on the same firm. We focus on the most liquid five-year U.S. dollar denominated contracts. The aggregate time series (averaged over all 500 firms) of CDS premium over LIBOR is plotted in Figure 3. There have been two major peaks in the time series corresponding to the wave of high-profile bankruptcies (including WorldCom and United Airlines) in late 2002 and the subprime crisis starting in late 2007. There was also a minor peak in April 2006, coinciding with the downgrading of GM debt. In the cross-section, the average (median) is 137 (57) bps and the 25<sup>th</sup> and 75<sup>th</sup> values are 28 and 145 bps, respectively.

To be consistent with the specifications in Panels A–C, we record for each firm the last trade of each year as the year-end default premium of the firm, and repeat the exercises specified by Equation (2) using the logarithm of the CDS spread as the dependent variable. Because the sample of firms with the CDS information is much smaller than the universe of public companies in

the DealScan database, we modify the industry fixed effects from the three-digit SIC Code level to the two-digit level. Results are reported in Panel D of Table 9.

In contrast to accounting measures that reflect firms' current conditions, CDS pricing is forward-looking and aggregates all the information that market participants have (including possible insider trading). As a result, the coefficient estimates reported in Panel D in Table 9 should be interpreted as the market's best estimates at each point in time for the borrowers' default premium during the subsequent five years. Interestingly, firms borrowing from non-CB dual holders see their CDS spread drop (i.e., their default probabilities decrease), while other new loan-receiving companies see a change in the opposite direction. During the two years prior to loan origination, borrowers with dual holders have significantly (at the 1% level) higher default premiums. Translating from the logarithm scale, the default spread on a borrower with dual holders in year  $t - 2$  is, on average, 19.7% higher than that of a borrower without any dual holder. At the median spread (60 bps), this difference amounts to about 12 bps (significant at the 10% level). In year  $t + 2$ , however, the difference is reversed to a difference of  $-11.2\%$  (about  $-7$  bps) in the opposite direction (not significantly different from zero); that is, borrowers with non-CB dual holders compare favorably to those without non-CB dual holders in terms of default probability in the second year after the loan.

As expected, CDS spreads incorporate public information. For example, the cross-sectional correlation between CDS spreads and the Altman Z-score, a summary accounting measure to capture a firm's bankruptcy risk, is significantly negative ( $-0.38$ ). More importantly, CDS spreads also contain non-public information that is impounded into prices by informed traders (Acharya and Johnson 2007) including forward-looking information that is not yet reflected in the current accounting variables (such as the Altman Z-score). Such an effective information aggregation is made possible by the fact that transactions of CDS contracts largely occur among sophisticated non-CBs, which could include participants of syndicated loans.

With this in mind, Panel D of Table 9 suggests that conditional on all information (both private and public) that is available to participants in the CDS market (including potential syndicate members), companies with non-CB dual holders appear to have riskier debt during the year of the loan origination or the years prior to it. Therefore, if the lower yield spread on the new loan results from the superior information about the borrowers' prospects, in the absence of monitoring, the information must be out of reach of any participants in the CDS market (so that it has not yet been impounded into the price). Such a scenario is highly unlikely, especially in the presence of insider trading on the CDS market. Additionally, even if this is the case, there is little reason for the dual holders to surrender their informational rent to the borrowers in the form of lower loan yield spreads. Thus, the cumulative evidence lends strong support for the incentive alignment hypothesis.

The combined evidence from Table 9 provides consistent and robust *ex post* justification for the lower loan yield spread associated with the presence of non-CB dual holders. It is worth noting that we obtain mixed results (untabulated) by applying the same analyses in Table 9 to compare loan receiving firms with only CB dual holders and those without. The lack of favorable *ex post* outcomes associated with CB dual holders also explains their weak effects on loan yield spreads (as reported in Table 7).

## 5. Conclusion

This article provides the first comprehensive analysis regarding a new and increasingly important phenomenon, the simultaneous holdings of equity and debt in the same companies by non-commercial banking institutions, or dual holding. The presence of non-CB dual holders offers a unique setting for testing the existence and magnitude of the conflicts of interest between shareholders and creditors.

We first demonstrate that syndicated loans with the presence of dual holders are associated with lower loan yield spreads (of 18 to 32 bps) than loans without dual holders. We then conduct a series of tests to differentiate between the incentive alignment hypothesis and the information hypothesis that both predict a negative correlation between the presence of dual holders and loan yield spreads. Results lend strong and consistent support to the first hypothesis. Moreover, the effect of the presence of dual holders on loan yield spreads is strengthened when the unobserved heterogeneity is controlled for.

We conclude that the presence of dual holders mitigates the conflicts between shareholders and creditors, thus lowering the cost of borrowing. Our findings offer one possible explanation for the emergence of “strip financing,”<sup>27</sup> and point to important extensions to the theories that try to rationalize investor specialization in holding different claims on firms (Berglöf and von Thadden 1994). Further studies are also called for to examine the presence of dual holders on corporate investment and financing decisions.

## Appendix: Variable Definitions

Variables	Definition
Variables of Interest	
<i>Spread</i>	Initial all-in-drawn spread is defined as the basis point coupon spread over LIBOR plus the annual fee and the upfront fee spread, if there is any.
<i>non-CB participation</i>	An indicator variable takes a value of one if at least one non-CB participates in a loan syndicate, and zero otherwise.
<i>non-CB major participation</i>	An indicator variable takes a value of one if at least one non-CB is a major participant of a loan syndicate, and zero otherwise.

<sup>27</sup> Strip financing refers to the practice of repackaging different types of obligations, such as debt, preferred stock, and common stock, into one security in order to mitigate conflicts of interest among holders of the separate claims. It is commonly used in venture capital, distress investment, and takeover transactions.

Variables	Definition
<i>non-CB dual holder</i>	An indicator variable takes a value of one if at least one non-CB lender of the facility has significant equity holdings in the borrowing firm or in the borrower's parent firm in the same quarter of loan origination, or zero otherwise. A non-CB dual holder could be a shareholder by itself, or through its subsidiaries. The threshold for a "significant" level of equity holding is chosen as: The position must amount to at least 1% of the borrower's common stock outstanding or its value must exceed two million dollars (or five million dollars if the lender is a shareholder of the borrower's parent). All dollar values are in 2006 constant dollars using the CPI deflator. Non-CB dual holders in the non-CB major participation subsample (Column (3) of Table 4, Column (4) of Table 5, and Column (2) of Table 6) are limited to non-CB dual holders that are also major participants of the loan syndicate.
<i>only CB participation</i>	An indicator variable takes a value of one if only CBs participate in a loan syndicate, and zero otherwise.
<i>CB dual holder</i>	An indicator variable takes a value of one if only CBs participate in a loan syndicate and at least one lender of the facility has significant equity holdings in the borrowing firm or in the borrower's parent firm in the same quarter of loan origination, or zero otherwise. A CB dual holder could be a shareholder by itself, or through its subsidiaries. The threshold for a "significant" level of equity holding is chosen as: The position must amount to at least 1% of the borrower's common stock outstanding or its value must exceed two million dollars (or five million dollars if the lender is a shareholder of the borrower's parent). All dollar values are in 2006 constant dollars using the CPI deflator.
<b>Loan Characteristics</b>	
<i>facilityamt</i>	Natural logarithm of the loan facility amount in 2006 dollars.
<i>maturity</i>	Natural logarithm of the loan maturity in months.
<i>secured</i>	An indicator variable takes a value of one if a loan is secured, and zero otherwise.
<i>missingsecured</i>	An indicator variable takes a value of one if the secured status of a loan is missing, and zero otherwise.
<i>revolver</i>	An indicator variable takes a value of one for revolving credit, and zero for term loans.
<i>lbtakeover</i>	An indicator variable takes a value of one if the primary purpose of the loan is either a leveraged buyout or a takeover, and zero otherwise.
<i>numlender</i>	Natural logarithm of one plus the total number of lenders in a loan syndicate.
<b>Borrower Characteristics</b>	
<i>assets</i>	Natural logarithm of the borrower's total assets.
<i>lev</i>	The borrower's book value of total debt over book value of total assets.
<i>b2m</i>	The borrower's book-to-market ratio, calculated as $TA / (TA + MKVALF - CEQ)$ , where TA is the book value of total assets, MKVALF is the market value of the firm at the fiscal year end, and CEQ is the book value of total common equity.
<i>growth</i>	The borrower's sales growth of the past three years (or as many years as possible).
<i>herfindahl</i>	The sum of squares of the fractions of sales contributed by the borrower's different business segments, measured in real numbers.
<i>inst</i>	The fraction of total institutional ownership in the borrower, measured in real numbers.
<i>stkreindadj</i>	The borrower's stock return in excess of the corresponding 3-digit SIC industry return.
<i>altman</i>	Altman bankruptcy Z-score is calculated $Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$ where $X_1$ is working capital/total assets, $X_2$ is retained earnings/total assets, $X_3$ is earnings before interest and taxes/total assets, $X_4$ is market value equity/book value of total liabilities, and $X_5$ is sales/total assets (Altman 1968). All X variables are winsorized at $-4.0$ and $+8.0$ . In regressions, we use Altman bankruptcy Z-scores excluding the term $X_4$ .
<i>sprate</i>	The borrower's S&P long-term domestic issuer credit rating. Higher value corresponds to lower rating. Missing ratings are assigned to zero.
<i>notsprated</i>	An indicator variable takes a value of one if the borrower does not have the S&P credit rating, and zero otherwise.
<i>analyst</i>	Natural logarithm of one plus the total number of analysts who make forecast and/or recommendations for the borrower's stock.
<i>stkvoll</i>	The borrower's stock return volatility using two prior years of monthly stock returns ending in the year of loan syndication (minimum three monthly returns over the last two-year period).
<i>amihud</i>	The Amihud (2002) illiquidity measure is defined as the yearly average of 1,000 times the square root of $-Return / (Dollar Trading Volume)$ , using daily data.
<i>sp500</i>	An indicator variable takes a value of one if the borrower belongs to the S&P 500 index, and zero otherwise.
<i>distance-to-default</i>	The number of standard deviation decreases in a firm's asset value that it would take for the firm to default.

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