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### Business Aggression, Institutional Loans, and Credit Crisis: Evidence from Lending Practices in Leveraged Buyouts

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**Business Aggression, Institutional Loans, and Credit Crisis: Evidence from Lending Practices in Leveraged Buyouts**

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# **Business Aggression, Institutional Loans, and Credit Crisis: Evidence from Lending Practices in Leveraged Buyouts**

## **Abstract**

This paper investigates the lending practices related to leverage buyouts (LBOs) market between high and low write-down institutions. The write-downs, which are a proxy for business aggression of institutions, are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. We find that high (low) write-down institutions increase (decrease) loan market share dramatically during the period of 2001-2006. The increase is mainly driven by the segment of loans sold to institutional investors, such as collateralized loan obligations vehicle, hedge fund, and insurance companies. Institutional loans originated by high write-down institutions carry significantly fewer covenants and higher interest spread than those by low write-down institutions during 2001-2006. However, there are no such differences during 1995-2000. The aggressive lending practice by high write-down institutions to lower quality borrowers during 2001-2006 appeared to be mitigated by reputable private equity (PE) investors. High write-down institutions arranged loans with more covenants and lower interest spread for borrowers with investments from more reputable private equity investors.

We contribute to extant literature in the area of financial crisis by providing empirical evidence that both business aggression of some institutions and the increase demand for institutional loans drive the peculiar lending practice during the easy credit period, which subsequently leads to declines in values of assets associated with these loans. Our focus on the role of PE reputation in mitigating aggressive lending practice complements recent studies in the

area of LBO loans market and PE reputation, such as Demiroglu and James (2008) and Ivashina and Kovner (2008). The findings of demand pressure (credit supply) from institutional loans add to the analyses of Ivashina and Sun (2008) and Wang (2008). We provide additional evidence that such increase in institutional loans demand is filled by some aggressive financial institutions, which ex post incur high write-downs during the credit crisis. Many such institutions pay horrendous prices for their business aggression and have ceased to exist in the market.

## 1. Introduction

Easy credit and business aggression in financial institutions in recent years not only fuel the problem in subprime mortgage market but also in other areas, such as leveraged buyout market. According to the U.S. loan market review by Loan Pricing Corporation, syndicated loan issuance dropped to just under \$230 billion in the second quarter in 2008. For the same period in 2007, the total issuing amount was almost \$582 billion. Loans purchases by institutional investors, such as collateralized loan obligations (CLOs) and loans funding leveraged buyouts experienced the greatest decline. The average secondary prices for leveraged loans were at a discount of 88 cents on the dollar.<sup>1</sup> Although the recent credit crunch has created ripple effects on many parts of the economy, research on the sources of the current crisis are just started to accumulate.

In this paper, we investigate whether business aggression of some institutions and the demands from institutional loan investors contributed to recent credit crisis. We utilize the write-downs of major financial institutions from the beginning of 2007 to August 10, 2008 as a proxy for business aggression. These write-downs are mainly due to losses from declining values of securities related to various types of home loans, commercial mortgages, and leveraged loans.<sup>2</sup> We use leveraged buyout related loans prior to 2007 to analyze the lending practices of financial institutions with different levels of write-downs (aggressiveness) to shed light on the sources of recent credit crisis.

Before the collapse of credit market, there were allegations that covenants in loans used for leveraged buyouts have been too light.<sup>3</sup> A Financial Time article stated the following: “During

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<sup>1</sup> For more details regarding the loan market, see “2Q08 U.S. Loan Market Review: A recession in syndicated lending” downloadable from [http://www.loanpricing.com/newsroom\\_files/press\\_release\\_2Q08.htm](http://www.loanpricing.com/newsroom_files/press_release_2Q08.htm)

<sup>2</sup> Write downs information is from Bloomberg. See “Banks' Subprime Losses Top \$500 Billion on Writedowns,” August 12, 2008.

<sup>3</sup> “Problem loans nearly triple in US,” October 8, 2008

2006 and early 2007, leading banks competed fiercely to lend to private equity groups, often dispensing with the usual covenants meant to secure such credits in a development that led to the so-called “cov-light loan.” Such a practice raises concern that financial institutions are too optimistic and lend recklessly because covenants can increase lenders’ incentive to monitor borrowers (Rajan and Winton, 1995). They are also important tools to control conflicts between stockholders and debt holders (Smith and Warner, 1979). This paper approaches the cov-light question by comparing lending practices among financial institutions. If the cov-light loans are justified economically and are sensible business strategy, then we should not observe systematic relation between institution types and the levels of covenants in loan contracts. We hypothesize that loans originated by institutions with reckless business aggression (high write-downs) contain fewer covenants than those by institutions with low write-downs. Besides covenants, we also compare market share changes and contrast the levels of interest spread between high versus low write-down institutions. The business aggression hypothesis predicts that high write-down institutions aggressively arrange loans for lower quality borrowers, which results in an increase in market share of LBO related loans, decreases in covenants, and increase in interest spread.

The second factor we examine is the demand for institutional loans, which are term loans B, C, D, sold to CLOs vehicle, hedge fund, insurance companies, and other institutional investors. Securitizations and loan sales permit a much bigger pool of non-bank investors to add loan investment in their portfolios. The easy credit period (2001-2006) pushes many investors searching for “relatively” higher yield products.<sup>4</sup> Such a demand may coerce some aggressive financial institutions with less stringent lending control to originated loans from lower quality

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<sup>4</sup> The Standard & Poor’s RatingsDirect report by Bavaria and Lai (2007) states the following “Covenant-lite loans represent a further example of investors’ continuing willingness to take on greater risk in pursuit of yield.” Nandy and Shao (2007) also show that institutional loan investors tend to lend to riskier borrowers or riskier loan purpose, such as LBO and takeover.

borrowers. Therefore, we test the institutional demand hypothesis that the aggressive lending practice is more pronounced in the institutional loans segment versus the traditional loans segment.

The third dimension that we analyze is the role of private equity investors during the easy credit period. These investors are also important players in the leveraged buyout market. They provide equity investments in many of the deals. Besides concerning the outcomes of current investments, many private equity investors have build precious reputations to be in the market in the long-run. Demiroglu and James (2008) find that reputable private equity investors pay narrower bank loan spreads and have fewer and less restrictive financial loan covenants. They conclude that the reputation of private equity investors mitigates the agency costs of debt and thus lowers the need for bank monitoring and control. Different from their study, our paper focuses on whether the reputation concerns of private equity (PE) investors can mitigate the business aggression of some institutions and reduce the deterioration of borrower quality – the PE reputational concern hypothesis.

We find that during the period of 2001-2006, high write-down institutions drastically increase their market shares in the LBOs related lending. The increase is mainly driven by the increase in institutional loans. Prior to the easy credit period (1995-2000), high write-down institutions indeed originate loans with more covenants than low write-down institutions in both institutional and non-institutional loan segments. During the easy credit period (2001-2006), the same pattern persists in the non-institution loan segment. However, in the institutional loan segment, high write-down institutions arranged loans with significantly fewer covenants, but higher interest spread. Demiroglu and James (2007) find that borrowers choose restricted loan covenants to exchange for lower interest cost and to credibly convey their credit quality because

for such firms they anticipate smaller probability of violating the covenants. Their findings suggest that high write-down institutions lend to borrower with worse credit quality than low write-down institutions. These results are consistent with the business aggression and institutional demand hypotheses that both factors contributed the peculiar lending practice during the easy credit period.

The findings on the PE reputation, in general, are consistent with prior studies and point to higher reputable PE investors are associated with lower covenants and lower interest spread, but they tend to be statistically insignificant. However, we find very robust results in the segment of institutional loans that are consistent with our PE reputational concern hypothesis during the easy credit period. We find that PE reputation and the number of covenants is negatively related for institutional loans arranged by low write-down institution have fewer covenants but such a reputation-covenant relation is reversed for the loans arranged by high write-down institutions. Besides PE reputation is significantly negatively related to interest spread for the institutional loans arranged by high write-down institutions. Given that, during the later period, high write-down institutions arranged institutional loans with significantly fewer covenants than low write-down institutions, the positive relation between PE reputation and the number of covenants suggests that more reputable PE can mitigate the aggressive lending practice of high write-down institutions.

We contribute to extant literature in the area of financial crisis by providing empirical evidence that both business aggression of some institutions and the increase demand for institutional loans drive the peculiar lending practice during the easy credit period, which subsequently leads to declines in values of assets associated with these loans. Our focus on the role of PE reputation in mitigating aggressive lending practice complements recent studies in the



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The rest of the paper is organized as follows. Section 2 summarizes recent developments in the credit market and crisis, related studies in the leveraged buyout market, and our hypotheses. Section 3 describes data selection and variable definitions. Section 4 discusses empirical findings. Section 5 concludes.

## **2. Credit crisis, Leveraged buyout market, and hypothesis**

### *2.1 Credit crisis and institution write-down as a proxy for lending aggression*

Over the past decade, “subprime” lending permeated financial markets, not just mortgages. Since Michael Milken popularized junk bonds, investors have found varying degrees of appetite for lower credit quality investments. It is difficult, however, to discern the unmanifested risk in such speculative financing during an expansionary cycle. Today’s vicious circle of illiquidity – excess supply and reduced financing capabilities leading to increased default risk leading to lower demand returning to reduced funding sources – therefore leaves ample opportunity to identify subprime lending and speculative-grade names from others and identify characteristics that led to the bubble.

Difficulties facing corporate loans -- and by extension collateralized loan obligations (CLOs) -- are well-known. These difficulties include the increasing corporate default rates and decreasing

recovery rates; the all-too-frequent downgrades of originally BB and B-rated assets to CCC levels, and their impact on CLO coverage test ratios; the challenges for CLO managers trying to build par coverage amid the “deep discount” purchase haircuts imposed by deal indentures; CLO event of default risks, and many more.

The preceding, “default-benign” credit cycle (2002–2007), displaying high levels of liquidity and strong demand, created the opportunity for corporations to borrow heavily, obtaining low coupons despite being supported by weak covenant packages. The performance of these borrowings – be they corporate bonds or bank loans – is, therefore, a crucial to the economy in general, and for CLOs in particular. While the performance of loans and bonds is crucial to the performance of CLOs, so too may the performance of CLOs be crucial to the performance of loans and bonds: CLOs are the largest investor in, and hence source of demand for, sub-investment-grade institutional loans. As such, any continuation (or revival) of the CLO market would bring with it the dual benefits of encouraging the syndication of loans – providing an additional, positive, financing alternative for companies – and increasing demand, which drives loan prices up, *ceteris paribus*.

Indeed the leveraged loan and CLO markets have been inseparable in recent years, growing in tandem from 2001 to mid 2007 (by which time the CLO “machine” had become responsible for purchasing as much as 60-65% of new-issue leveraged loans). CLOs’ collateral composition, too, evolved during the benign cycle, with the supply of first lien loans being finite, and with managers perhaps taking more liberties in their asset selection. Among others, we noticed a steady increase in CLOs’ average percentage exposure to (1) covenant light loans (from  $\pm 5\%$  for CLOs issued in 2000 to  $\pm 20\%$  for post 2006-vintage CLOs); and (2) non 1st lien loans, including increased exposure to corporate bonds and structured finance securities.

Arguably the three determining factors in the performance of CLOs as a whole will be, the default rates of their underlying corporate bonds and loans, the timing of those defaults; and the recoveries realized upon default. Default rates on speculative grade companies, currently nearing the 5% level depending on the data source's calculation technique, are regularly forecasted to reach between 8% and 14% by the end on 2009, with the three-year (2008-2010) cumulative default rate ranging from 20 to 30%.

Various research studies have described the additional burden on CLOs in a high default environment with the inversely correlated, proportionately low, associated recovery rates. While this supply and demand imbalance has proven a burden in the best of times, the scarcity of refinancing sources (including debtor-in-possession financing) is particularly troublesome as it may force defaulting companies to resort to Chapter 7 bankruptcy filings (liquidation) as opposed to being able to re-emerge via reorganization under Chapter 11. The liquidation process often decreases the value of the company's assets, further reducing the realizable recovery on its debt.

Even for structurally similar instruments issued by the same company, differences in their related covenants and clauses may distinguish their market prices, assumed default probabilities and expected recoveries upon default. Essentially, the more numerous the restrictions imposed, the earlier a company is likely to trigger one during tough times; the earlier a covenant is triggered, from a lender's perspective, the more likely that some substance remains in the troubled company to effectuate a meaningful recovery. For covenant light loans, the absence of certain covenants would decrease the probability of defaulting on the loan but, if and when it may default, may substantially lower its expected recovery.

From a lender's perspective, the leveraged loan market offered enticing opportunities, not entirely dissimilar from venture capital and private equity: the loans were historically supported by restrictive financial and operating covenants – which allowed lenders significant control over the borrower's activities – and a (typically first) priority interest in the assets with which the borrower secured the loans. Together, the covenants and the priority interest increased the likelihood of high, if not full, recovery upon the borrower's default. Covenants, more particularly encourage the borrowing company to manage across its capital structure, serving both its creditors and shareholders. This is achieved by allowing creditors to monitor the company's performance against certain restrictions, and potentially secure more favorable terms if the company's financial condition deteriorates from where it was when credit was extended.

While the potential effects of covenants are difficult to measure, *ex ante*, their manifestation, *ex post*, is therefore evident in higher loss rates. Hence, we use higher loss rates as a first proxy for lending aggression, particularly through covenant light loans.

## *2.2 Leveraged buyout market and private equity investment*

In LBOs, buyout sponsors typically buy up all the publicly traded stock of target companies or majority equity ownership of private held companies. These transactions are done partially with borrowed money, e.g., junk bonds or syndicated bank loans. The leveraged buyout industry has grown dramatically since the 1980s. The first boom of leveraged buyouts was to some extent aided by rising stock prices and the rapid development of the junk bond market in the late 1980s. KKR'S \$25 billion hostile takeover of RJR Nabisco marked the peak of the first LBO boom.<sup>5</sup> After the collapse of Drexel Burnham Lambert and crash of the junk bond market, leveraged buyouts almost disappeared after 1990. Subsequently, a large number of high-profile leveraged

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<sup>5</sup> The detailed description is provided in "Barbarians at the Gate" by Burrough and Helyar, published by HarperCollins. See Kaplan and Stromberg (2008) for a review of LBO/PE industry.

buyouts went into bankruptcy. Andrade and Kaplan (1998) report that approximately 29% of 136 MBOs and leveraged recaps done in 1980s failed later.

The leveraged buyout market slowly recovered during the 1990s and early 2000s. During the 1980s, the US buyout industry was made up of a relatively small number of organizations, while after the 1990s the leveraged buyout market witnessed the tremendous growth in both size and number of transactions. The industry is dominated by a small number of large private equity firms that typically have the ability for raising gigantic funds. Large transactions with their sponsors include purchases like the following in recent years: Harrah's Entertainment for \$27.4 billion (by Apollo and Texas Pacific); Freescale Semiconductor for \$17.6 billion (by Blackstone, Carlyle, Permira, and Texas Pacific); Hertz for \$15 billion (by Carlyle, Clayton Dubilier & Rice, and Merrill Lynch). In 2006 alone, private equity firms in U.S. raised over \$140 billion in LBO funds and bought more than 650 U.S. companies for a record \$375 billion, according to Thomson Financial.

Private Equity investment typically involves bootstrap leverage financing in which buyout sponsors bootstrap acquisition through two stages: they first set up a new acquisition subsidiary to issue debt backed by targets' asset or future cash flows in order to acquire majority stocks through takeovers; in the second stage, buyout sponsors merge targets with indebted acquisition conduit and complete the transaction thereafter. In a typical LBO, equity on average accounted for between 15 to 30 percent of the purchase value, with debt providing the remainder. During the 1980s, private equity investment largely depended on high-yield bond issuance for bridging finance. However, in recent years, the huge amount of liquidity in the syndicated loan market – in part due to the increasing willingness of financial institutions such as investment banks or commercial banks to lend to private equity firms – provided a major source of financing for

LBOs. For example, Ljungqvist, Richardson, and Wolfenzon (2008) find that buyout funds accelerate their investment flows when credit market conditions loosen, while Axelson, Jenkinson, Stromberg and Weisbach (2008) confirm that LBOs not only use more leverage but also have higher pricing when economy-wide leveraged loan spreads are lower. Demoriglu and James (2008) identify that loan covenants became less restrictive at the end of the recent wave. Ivashina and Kovner (2008) find that bank relationship of private equity firms helps to lower LBO loan spread. Different from all the previous studies, our paper examines the impact of the shift in risk preference of lending institutions as an explanation for excessive LBO loans and loose contracting of loan covenants and links this lending practices to the credit crisis.

### *2.3 Hypotheses*

According to the report by Bavaria and Lai (2007), Standard & Poor's defines "covenant-lite" loans as those without maintenance financial covenants, such as minimum fixed-charge coverage and total debt limitations, but with incurrence covenants. Unlike maintenance covenants, which have to be maintained throughout the life of the loan, the restrictions set by incurrence covenants do not have to be met on an ongoing basis unless the borrowers take one of the specific actions that invoke a covenant. Therefore, borrowers' financial condition can deteriorate well beyond the level that lenders would have applied some remedies and miss the opportunity to increase the recovery from troubled borrowers. Chava and Roberts (2008) show that covenants, which allow state-contingent allocation of control rights, can reduce investment distortions.

If lenders anticipate the negative implication of covenant-lite loans, they should demand higher interest spread. Demiroglu and James (2007) find that borrowers choose restricted loan covenants to exchange for lower interest cost and to credibly convey their credit quality because for such firms they anticipate smaller probability of violating the covenants. Their findings suggest that light covenants coupled with high interest rate imply lower quality borrowers. Fees

are lucrative from this type of borrowers. A new leveraged loan can carry an arranger fee of up to 2.5% of the total loan commitment (Miller, 2006). If some institutions with aggressive business culture chose to pursue such high fees that are not economically justified, then this business aggression can lead these financial institutions astray and to incur high write-downs during credit crisis. In this case, we would observe that high write-down institutions arranged more loans with fewer covenants protection and higher interest spread than low write-down institutions – the business aggression hypothesis.

The developments in the loan market have changed lender constituencies. There are two major types of syndicated lenders: banks and institutional investors. Banks and finance companies tend to lend at a pro rata basis in the so-call “pro rata” tranches, which include revolving credit and term loan A. All types of lenders may buy institutional tranches but these loans are structured specifically for institutional investors. Institutional loans include term loan B, C or D because they are lined up behind term loan A. By 2006, many loans only constitute revolving credit and institutional term loans (Miller, 2006). During the easy credit period, one challenge for asset managers is to increase the return of their investments because of historically low interest rates. The search and demand for high yield products may play a role in coercing some institutions to engage in reckless lending and to bring in lower quality borrowers. If such an institutional demand is an important factor contributes to the recent credit crisis, then we should observed that high write-down institutions arranged more institutional loans and such loans arranged by high write-down institutions have fewer covenants and higher interest spreads than those by low write-down institutions. We test these predictions as the institutional demand hypothesis.

Besides financial institutions (who are the main arrangers and investors of loans) and institutional loan investors, another important player in the LBOs market is private equity investors. These PE investors also provide funding to borrowers by acquiring significant ownership of target firms. Although easy credit can motivate some PE investors to take advantage of the liquidity and invest in lower quality borrowers. However, more reputable PE investors have more reputational capital to lose if the borrowers go under. Particularly, recent studies, such as Demoriglu and James (2008) and Ivashina and Kovner (2008) find that PE investors' reputation and their relationship with lenders matter in structuring lending terms, respectively. Therefore, we analyze a different aspect of reputation effect and test if PE investors' reputational concerns play a role to alleviate the aggressive lending practice of some financial institutions. The PE reputational concern hypothesis predicts that high write-down institutions arrange loans with more covenants and lower interest rates to borrowers with more reputable PE investments.

### **3. Sample selection and variable definition**

#### *3.1 Sample selection and distribution*

We use the deal synopsis in Securities Data Corporations (SDC) to classify the buyout as private equity sponsored leveraged buyout (LBO). SDC uses a classification that is based on the type of investor that leads the deal and not on the amount of equity participation by each investor type. We also include management buyout (MBO) when investor leading the deal is management group. We identify loans lend to companies during the year or within five years of the above private equity investments. We did not exclude loans with the deal purpose other than LBO and Takeover because firms with PE investments may also borrow for other purposes, such as



refinancing or corporate purpose. These loans are obtained from the DealScan database of Reuters Loan Pricing Corporation.

The sample period starts from 1995 to 2006, which covers 6 years prior to and following the burst of Internet bubble. The post-bubble period (2001-2006) is the time marked by low interest rate and loose credit. Because of the test design, we only consider loans lent by major financial institutions with write-down information collected from Bloomberg. The write-downs are mainly due to the credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts of each institution available in DealScan from 2001 to 2006. For each institution, high write down institutions are those if the % of write down scaled by loan amount is above median.

To make the loan type as homogeneous as possible, we only use term loans in our analysis. After removing facilities with missing values, the final sample consists of 1073 loans. Figure one shows the frequency distribution of sample by year and by institution write-down type. Low write-down institutions appear to reduce the number of loans during the post-bubble period. On the contrary, high write-down institutions increase such transactions over time. Because some loans deals can be lead-arranged by both high and low write-down institutions, we classify such deals as mix type. Loans arranged by mix type institutions also appear to increase during the second half of the sample period. The same information is reported in Table 1. Overall, low write-down institutions arranged 57.2% of loans; high type 28.2%; mix type 14.5%. Comparing the two sub-periods, low write-down institutions decrease market share from 72.76% to 42.93%, while high and mix write-down institutions increase market share from 21.01% to 34.88% and from 6.23% to 22.18%, respectively.

Table 2 analyzes the distribution of loans by loan type and deal purpose. The type of loan deals increase for high and mix write-down institutions during 2001-2006 are mainly term loan B, which is originated to be sold to institutional investors, such as hedge funds and insurance companies. On the other hand, the reduction in loan deals for low write-down institutions is mainly in term loan and term loan A, which are the traditional bank loans. Although low write-down institutions arranged about the same number of loans for the purpose other than LBO/Takeover between sub-periods, the loans for LBO/Takeover dropped from 182 to 58. In contrast, mix and high write-down institutions do not show such a drastic drop for the loans with the deal purpose of LBO/Takeover. Tables 1 and 2 suggest that high write-down institutions originate loans more aggressively than low write-down institutions during the post-internet bubble period when the credit market was loose.

Table 3 reports the loan distribution by institution. There are 31 major financial institutions in our sample. Among them 15 are classified as high write-down institutions. They include investment banks such as Bear Stearns, Lehman Brothers, Merrill Lynch, and Morgan Stanley. The former three entities no longer exist. Among major commercial banks, CIBC, Citigroup, Credit Suisse, Mizuho Financial, National City Corp, Royal Bank of Scotland, UBS, Wachovia and Wells Fargo are classified as high write-down institutions. The three largest lenders with combined total loan market shares about 50%, Bank of America, JP Morgan, and Deutsche Bank, are low write-down institutions. All three reduce lending activities dramatically. The combined market share decreases from 65% to 37%. On the contrary, 14 out of 15 high write-down institutions increase loan market share during the same period.

### *3.2 Variable definitions and summary statistics*

The key loan characteristic in our analysis is covenants.<sup>6</sup> It is difficult to analyze individual covenants in great details because different loans can have different types or sets of covenants. Therefore, we follow Bradley and Roberts (2004) by using a covenant index. Specifically, covenant index is defined as the sum of six covenant indicators, which are collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep. This measure is very suitable for our analysis because we would like to examine whether aggressive institutions tend to lend the so-called cov-light loans. Table 4 reports average covenants by institution type and by sub-period. In both periods, mix institutions have the higher value of covenant index than the other two types – high and low, but there is no difference between high and low institutions regardless of time period.

During the first half of sample period (1995-2000), there is no significant difference between low and high write-down institutions in all variables listed in Table 4, which suggests both institutions lent similarly. During the post bubble period (2001-2006), high write-down institutions charged higher interest rate, lent with longer maturity, arranged more institutional loans, co-lead arranged loans less often than low write-down institutions. These results indicate that high and low write-down institutions pursued different lending practices during the period with loose credit. Mix write-down institutions appear to have very different loan and borrower characteristics from both high and low write-down institutions. During the post bubble period, mix write-down institutions originated loans with more covenants, lower interest rate, and larger loan amounts for larger borrowers. These findings suggest that mix institutions' lending practice is less aggressive than that of high write-down institutions.

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<sup>6</sup> The other key variable is all-in-drawn spread expressed in basis point. It includes interest cost over LIBOR or prime rate and annual fees.

For each LBO with a private equity investor, we create a private equity firm reputation measure by calculating the vintage age of the private equity firm from Thomson Financial. The vintage age measures the year difference between the founding year of a private equity firm and the year of its investment in a buyout transaction. The private equity firms with the highest reputation scores in various years are Kohlberg Kravis Roberts, Carlyle Group, Blackstone Group, Goldman Sachs Capital Partners, and Texas Pacific Group. This measure is consistent with Cao and Lerner (2009) who use vintage age of private equity firms as reputation proxy.<sup>7</sup> If there are multiple private equity firms investing in our sample LBO, we then use the reputation measure of the firm with the highest reputation. Officer, Ozbas, and Sensoy (2008) find that LBO deals with more than one private equity investor pay lower prices to targets, so we control for the number of private equity investors in our analysis. There is a high positive correlation between the various reputation measures of a private equity firm, suggest that they are reasonable proxy for the private equity firm's reputation. Table 4 reports the age of private equity investors that have invested in borrowers. There are no statistically significant differences among different types of institutions in terms of private equity firms' reputation.

#### **4. Empirical results**

Our paper complements Demoriglu and James (2008), which focuses on how private equity firm's reputation affects the contract terms of loans and Ivashina and Kovner (2008), which analyzes bank relationship of private equity firms. Unlike these two papers, our focus is on whether the changes in lending practices during post bubble period is due to aggressive business

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<sup>7</sup> We also construct alternative measure of reputation such as total capital under-management or investment record of a private equity firm. Investment record is the total dollar amount of all SDC-recorded public-to-private and private-to-private buyout transactions that a private equity firm invested in during the prior three years. However, both measures are missing for many observations and they tend to be available for more reputable private equity investors, so we use vintage age of private equity firms as reputation proxy.

strategies in some institutions and the drivers of such a development. We utilize the recent write-downs of major institutions related to leverage buyout loans and mortgage back securities as a proxy for business aggression. So we compare the lending practices between high and low write-down institutions. We hypothesize that high write-down institutions are those bringing lower quality borrowers to the market by using cov-light loans and charging higher interest rates. If such lending practice is economically justified, then institutions engage in such a practice would not have incurred substantial higher write-downs ex post. Besides analyzing who originated cov-light loans, we also investigate whether the recent development in institutional loans is one of the drivers of such aggressive lending.

Because the sample constitutes most of private firms, so we only have three firm characteristics for analysis. They are sales at loan close, company age, and industry. Table 5 reports the determinants of covenant index by sub-period and by institutional loan. We find that, compared to low write-down institutions, high write-down institutions originated significantly fewer covenants only in the institutional loan segment during the post bubble period. The estimates on private equity firm's reputation also show different pattern from those for other subsamples. Higher private equity firm reputation is associated with fewer covenants for loans originated by low write-down institutions. However, the significantly positive estimate on interaction between private equity firm reputation and high write-down institutions indicates that the level of covenants in loans originated by high write-down institutions is positively related to private equity firm's reputation. Demiroglu and James (2007) find that borrowers choose restricted loan covenants to exchange for lower interest cost and to credibly convey their credit quality because for such firms they anticipate smaller probability of violating the covenants. Taken together, these findings suggest that high write-down institutions lent with fewer

covenants than low write-down institution, which suggests lending to lower quality borrowers. Reputable private equity investors mitigate such an aggressive lending practice by bringing in relatively higher quality borrowers who self-select to use more covenants to reduce interest costs.

During the first half of our sample period, loans originated by high write-down institutions indeed have significantly more covenants than those by low write-down institutions regardless of loan type. Private equity firm's reputation is positively related to the level of covenants for the loans originated by low write-down institutions in the segment of institutional loans. Institutional loans borrowed by larger companies (sales as the proxy for firm size) also have more covenants. However, such a relation is not significant in the segment of non-institutional loans regardless of time period. Loans lead-arranged by more than one lender and loans with the stated purpose of LBO and takeover have more covenants. Most of the estimates on control variables, such as the number of private equity investors, borrowing company age, whether the company is in a high-tech industry, loan amount, and loan maturity are not significant during the first half of the sample period. During the post-bubble period, larger borrowing firms and firms with more private equity investors have more covenants in the loan contracts.

Table 6 reports the regression analysis of interest spread. Consistent with the findings in Table 5 that, during the post-bubble period, high write-down institutions lent to lower quality borrowers in the institutional loan segment, they charge significantly higher interest rates than low write-down institutions. Again, reputable private equity investors appear to mitigate such an aggressive lending practice, borrowing companies with investment by more reputable private equity investors pay lower interest rate in institutional loans originated by high write-down institutions. Such a relation does not exist during other sub-period and in the segment of non-institutional loans. The estimates of most of the control variables are not significant.

We conduct two robustness tests. Because 14.5% of loans are lead arranged by the mix write-down institutions, we re-examine the regression analysis for institutional loans during the post-bubble period without those loans. Table 7 shows that the findings are robust. The second robustness check is to address mergers among major financial institutions. Because the write-down information is only available for the post-merged entities, so it is impossible to classify the pre-merger targets. DealScan updates the lender parent companies and does not keep the old lender parent companies, so we restore the original lender parent companies by using the mergers and acquisitions database from SDC Platinum of Thomson Financial. We remove observations if the original lender parent companies upon loan origination are different from the most recent lender parent companies. The main results reported in Table 8 are robust.

## **5. Conclusions**

The credit crisis started in 2007 has caused major financial institutions to write down more than \$500 billion by mid-August 2008. The wealth destruction in various capital markets has been unprecedented. Crisis of this magnitude does not happen in one night and is not caused by a few factors. However, it is important to investigate critical pieces before we can put the whole picture together. We choose to examine the lending practice related to leveraged buyout market prior to the credit crisis because it has caused major concerns other than the mortgage market.

We find that high write-down institutions engaged in reckless lending during the period of 2001-2006. They increased lending activities aggressively, particularly in the institutional loan segment, while low write-down institutions were cutting back in lending. Compared to low write-down institutions, institutional loans originated by high write-down groups carried fewer covenants and higher interest spread suggesting that high write-down institutions lent to lower

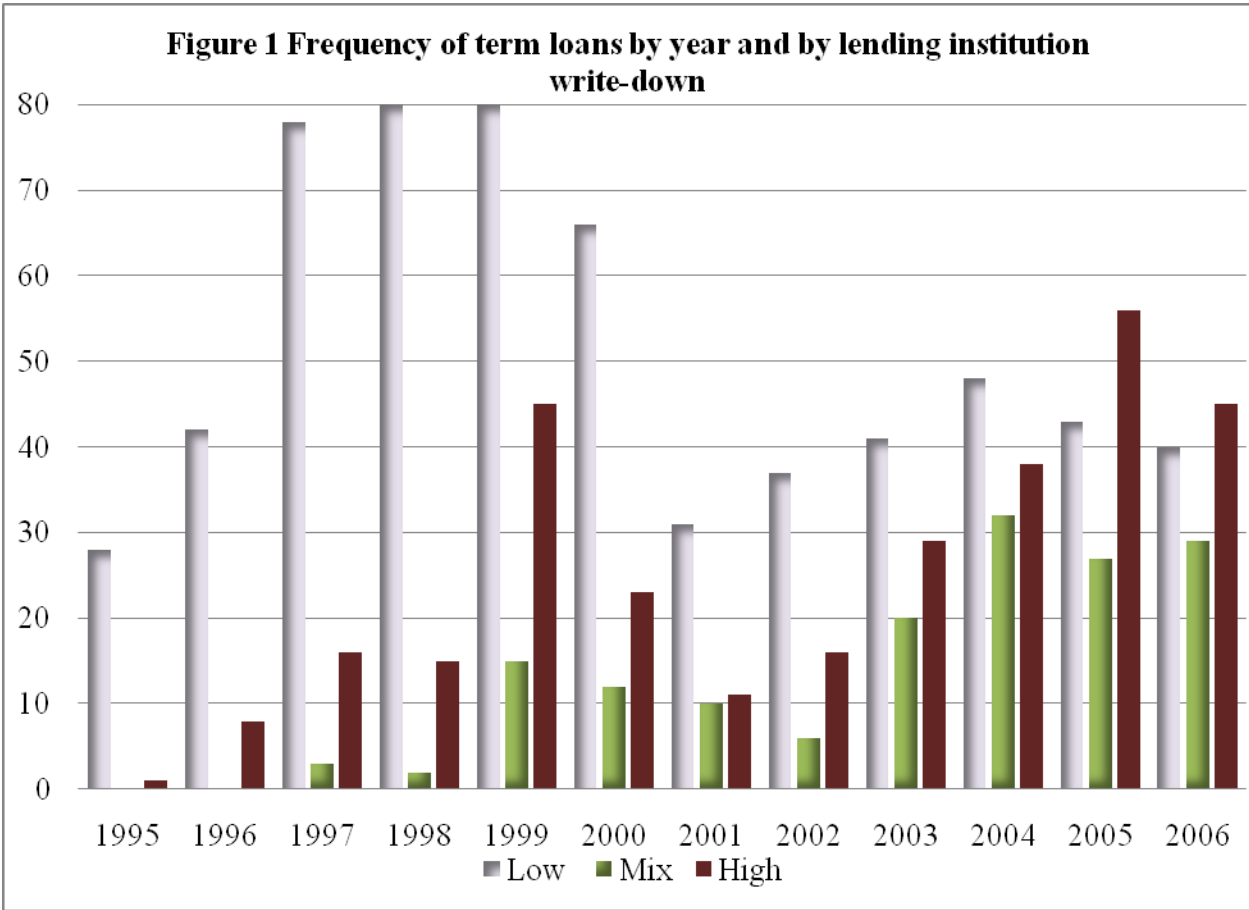
quality borrowers. However, the presence of reputable PE investors can mitigate the aggressive lending practice of high write-down institutions. The evidence in this paper indicates that both business aggression and institutional demand contribute to recent credit crisis.



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The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions represent both high and low write-down institutions serving as lead arrangers in the same deal.

**Table 1 Frequency distribution of term loans by year and by lending institution write-down**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal.

Year	Total	Low write-down		Mix write-down		High write-down	
	No.	No.	%	No.	%	No.	%
1995	29	28	96.6	0	0.0	1	3.5
1996	50	42	84.0	0	0.0	8	16.0
1997	97	78	80.4	3	3.1	16	16.5
1998	97	80	82.5	2	2.1	15	15.5
1999	140	80	57.1	15	10.7	45	32.1
2000	101	66	65.4	12	11.9	23	22.8
2001	52	31	59.6	10	19.2	11	21.2
2002	59	37	62.7	6	10.2	16	27.1
2003	90	41	45.6	20	22.2	29	32.2
2004	118	48	40.7	32	27.1	38	32.2
2005	126	43	34.1	27	21.4	56	44.4
2006	114	40	35.1	29	25.4	45	39.5
1995-2000	514	374	72.76	32	6.23	108	21.01
2001-2006	559	240	42.93	124	22.18	195	34.88
Total	1,073	614	57.2	156	14.5	303	28.2

**Table 2 Frequency distribution of term loans by loan type and by purpose**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serve as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal.

	<b>Total</b>	<b>Low write-down</b>		<b>Mix write-down</b>		<b>High write-down</b>	
<b>Loan type</b>	<b>No.</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>	<b>No.</b>	<b>%</b>
<b>Panel A: 1995-2000</b>							
Revolver/Term Loan	23	16	69.6	0	0.0	7	30.4
Term Loan	148	104	70.3	6	4.1	38	25.7
Term Loan A	130	97	74.6	10	7.7	23	17.7
Term Loan B	163	120	73.6	12	7.4	31	19.0
Term Loan C	40	29	72.5	4	10.0	7	17.5
Term Loan D	10	8	80.0	0	0.0	2	20.0
Non-LBO Takeover	252	192	76.2	13	5.2	47	18.7
LBO Takeover	262	182	69.5	19	7.3	61	23.3
Total	514	374	72.8	32	6.2	108	21.0
<b>Panel B: 2001-2006</b>							
Term Loan	147	78	53.1	21	14.3	48	32.7
Term Loan A	73	39	53.4	14	19.2	20	27.4
Term Loan B	307	113	36.8	79	25.7	115	37.5
Term Loan C	26	8	30.8	6	23.1	12	46.2
Term Loan D	6	2	33.3	4	66.7	0	0.0
Non-LBO Takeover	404	182	45.1	87	21.5	135	33.4
LBO Takeover	155	58	37.4	37	23.9	60	38.7
Total	559	240	42.9	124	22.2	195	34.9

**Table 3 Frequency distribution of term loans by lending institution and by bubble/post-bubble period**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution.

Lending institution name	Write-down	=1 if high	(1) 1995-2006		(2) 1995-2000		(3) 2001-2006		(3)-(2)	
			No.	%	No.	%	No.	%	No.	%
ABN AMRO Bank NV	0.53	0	22	1.49	3	0.44	19	2.40	16	1.96
BNP Paribas SA	0.81	0	48	3.25	20	2.92	28	3.53	8	0.61
Bank of America	2.55	0	327	22.14	191	27.92	136	17.15	-55	-10.77
Barclays Bank Plc	1.62	0	5	0.34	0	0.00	5	0.63	5	0.63
Bear Stearns Cos	6.49	1	21	1.42	0	0.00	21	2.65	21	2.65
CIBC World Markets	8.53	1	36	2.44	22	3.22	14	1.77	-8	-1.45
Calyon Corporate & Investment Bank	2.29	0	13	0.88	8	1.17	5	0.63	-3	-0.54
Citigroup	5.60	1	75	5.08	31	4.53	44	5.55	13	1.02
Commerzbank AG	1.43	0	1	0.07	1	0.15	0	0.00	-1	-0.15
Credit Suisse	3.03	1	129	8.73	54	7.89	75	9.46	21	1.57
Deutsche Bank AG	1.78	0	110	7.45	76	11.11	34	4.29	-42	-6.82
Dresdner Bank AG	2.13	0	4	0.27	2	0.29	2	0.25	0	-0.04
Goldman Sachs & Co	1.79	0	71	4.81	24	3.51	47	5.93	23	2.42
ING Group	2.86	1	1	0.07	0	0.00	1	0.13	1	0.13
JP Morgan	1.17	0	299	20.24	179	26.17	120	15.13	-59	-11.04
KeyBank	1.76	0	12	0.81	1	0.15	11	1.39	10	1.24
Lehman Brothers	6.10	1	33	2.23	12	1.75	21	2.65	9	0.90
Marshall & Ilsley Corp	71.68	1	1	0.07	1	0.15	0	0.00	-1	-0.15
Merrill Lynch & Co Inc	25.76	1	50	3.39	6	0.88	44	5.55	38	4.67

Mitsubishi UFJ Financial Group Inc	0.67	0	1	0.07	1	0.15	0	0.00	-1	-0.15
Mizuho Financial Group	3.40	1	4	0.27	4	0.58	0	0.00	-4	-0.58
Morgan Stanley	7.73	1	16	1.08	2	0.29	14	1.77	12	1.48
National City Corp	18.04	1	6	0.41	0	0.00	6	0.76	6	0.76
RBC Capital Markets	1.21	0	4	0.27	0	0.00	4	0.50	4	0.50
Royal Bank of Scotland Plc	2.86	1	10	0.68	2	0.29	8	1.01	6	0.72
Societe Generale	2.47	0	4	0.27	3	0.44	1	0.13	-2	-0.31
Sumitomo Mitsui Banking Corp	0.76	0	2	0.14	2	0.29	0	0.00	-2	-0.29
UBS AG	18.50	1	30	2.03	2	0.29	28	3.53	26	3.24
US Bancorp	2.25	0	8	0.54	3	0.44	5	0.63	2	0.19
Wachovia Corp	7.17	1	93	6.30	21	3.07	72	9.08	51	6.01
Wells Fargo & Co	8.52	1	41	2.78	13	1.90	28	3.53	15	1.63
Total			1,477	100.00	684	100.00	793	100.00		

**Table 4 Summary statistics of terms by lending institution write-down and by bubble/post-bubble period**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal. Interest spread over LIBOR (prime rate) expressed in basis points is all-in-drawn spread, which includes interest cost over LIBOR (prime rate) and annual fees. Covenant index is defined as the sum of six covenant indicators, which are collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep. Institutional loans are term loan B, C, or D, which are sold to institutional investors. Non-institutional loans are revolver/term loan, term loan, and term loan A. The null hypothesis of test is that there is no difference between different types of institutions. Sample mean and difference in mean are reported.

	<b>Low write-down</b>	<b>Mix write-down</b>	<b>High write-down</b>	<b>Difference: Low-Mix</b>		<b>Difference: Low-High</b>		<b>Difference: Mix-High</b>	
<b>Panel A: 1995-2000</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>						
Covenants index	3.72	4.81	3.96	-1.10	***	-0.25		0.85	**
Interest spread (basis point)	271.68	303.52	288.41	-31.84	**	-16.73		15.11	
Loan amount in 2000 dollar (Mil)	123.14	319.43	100.48	-196.29	***	22.66		218.95	***
Loan maturity (month)	68.83	71.38	69.45	-2.54		-0.62		1.92	
=1 if more than one lead arranger	0.23	1.00	0.20	-0.77	***	0.03		0.80	***
Number of lead arrangers	1.30	2.25	1.24	-0.95	***	0.06		1.01	***
=1 if loan purpose is for LBO or takeover	0.49	0.59	0.56	-0.11		-0.08		0.03	
=1 if it is institutional loan	0.42	0.50	0.37	-0.08		0.05		0.13	
Number of private equity investors	3.22	3.47	2.16	-0.25		1.06		1.31	***
Age of private equity investors	17.91	15.66	16.14	2.25		1.77		-0.48	
Borrowing company sales (Mil)	629.35	1221.05	692.15	-591.70	**	-62.80		528.90	
Age of borrowing company	20.14	44.97	21.82	-24.83	***	-1.68		23.14	***
=1 if borrower is a high-tech firm	0.40	0.28	0.36	0.12		0.04		-0.08	

\* , \*\* , \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.



**Table 4 (Continued)**

	<b>Low write-down</b>	<b>Mix write-down</b>	<b>High write-down</b>	<b>Difference: Low-Mix</b>		<b>Difference: Low-High</b>		<b>Difference: Mix-High</b>	
<b>Panel B: 2001-2006</b>	<b>Mean</b>	<b>Mean</b>	<b>Mean</b>						
Covenants index	2.21	3.05	1.96	-0.84	***	0.24		1.08	***
Interest spread (basis point)	346.27	329.76	402.09	16.51		-55.81	***	-72.33	***
Loan amount in 2000 dollar (Mil)	126.64	296.91	148.10	-170.27	***	-21.46		148.81	***
Loan maturity (month)	61.48	73.19	66.44	-11.71	***	-4.96	***	6.74	***
=1 if more than one lead arranger	0.32	1.00	0.23	-0.68	***	0.10	**	0.77	***
Number of lead arrangers	1.36	2.08	1.27	-0.72	***	0.09	*	0.81	***
=1 if loan purpose is for LBO or takeover	0.24	0.30	0.31	-0.06		-0.07		-0.01	
=1 if it is institution loan	0.51	0.72	0.65	-0.21	***	-0.14	***	0.07	
Number of private equity investors	1.80	2.02	1.65	-0.22		0.15		0.37	**
Age of private equity investors	18.43	19.03	18.68	-0.61		-0.25		0.36	
Borrowing company sales	592.40	1829.84	635.04	-1237.44	***	-42.64		1194.81	***
Age of borrowing company	29.11	31.10	29.07	-1.99		0.04		2.02	
=1 if borrower is a high-tech firm	0.38	0.47	0.38	-0.09	*	-0.01		0.08	

\* \*\* \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

**Table 5 Regression analysis of covenants index by bubble/post-bubble period and by institution loans**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal. Sample period starts from 1995 to 2006. The dependent variable is covenants index. Covenant index is defined as the sum of six covenant indicators, which are collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep. Institutional loans are term loan B, C, or D, which are sold to institutional investors. Non-institutional loans are revolver/term loan, term loan, and term loan A. Cluster standard errors that allow correlation within a borrower are used.

	1995-2000						2001-2006					
	Institutional loans			Non-institutional loans			Institutional loans			Non-institutional loans		
	Coef.	<i>t</i> -test		Coef.	<i>t</i> -test		Coef.	<i>t</i> -test		Coef.	<i>t</i> -test	
=1 if high write-down institution	2.63	1.70	*	1.81	1.63	*	-3.30	-2.46	**	3.37	2.08	**
=1 if mix write-down institutions	0.47	0.64		-0.28	-0.42		-0.54	-1.22		0.28	0.56	
Number of private equity investors	0.01	0.83		0.02	1.53		0.35	2.98	***	0.43	4.41	***
Ln(1+age of private equity investors)	0.54	2.02	**	0.30	1.27		-0.56	-2.66	***	0.24	0.71	
High write-down X private equity age	-0.67	-1.21		-0.66	-1.70	*	0.98	2.15	**	-1.02	-1.88	*
Ln(1+borrowing company sales)	0.42	2.62	***	0.08	0.52		0.33	2.57	***	0.42	3.53	***
Ln(1+age of borrowing company)	-0.16	-1.15		-0.06	-0.51		-0.15	-1.00		0.16	0.94	
=1 if borrower is a high-tech firm	0.50	1.48		0.15	0.51		0.45	1.40		0.95	2.55	***
Ln(1+loan amount)	-0.01	-0.05		0.12	0.95		0.44	2.90	***	-0.20	-1.21	
Ln(1+loan maturity)	0.003	0.30		-0.004	-0.64		-0.01	-1.22		-0.01	-0.87	
=1 if more than one lead arranger	0.91	2.81	***	1.37	4.83	***	0.70	1.77	*	-0.07	-0.17	
=1 if loan purpose is for LBO/takeover	0.63	1.71	*	0.94	3.01	***	0.28	0.86		-0.12	-0.35	
Intercept	-6.38	-2.07	**	0.41	0.14		-4.02	-1.55		-7.81	-3.59	***
Adjusted R2	0.23			0.17			0.19			0.22		
Number of observations	213			301			318			189		
Number of clusters	129			205			197			136		

\*, \*\*, \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

**Table 6 Regression analysis of interest spread by bubble/post-bubble period and by institutional loans**

The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal. Sample period starts from 1995 to 2006. The dependent variable is interest spread. Interest spread over LIBOR (prime rate) expressed in basis points is all-in-drawn spread, which includes interest cost over LIBOR (prime rate) and annual fees. Institutional loans are term loan B, C, or D, which are sold to institutional investors. Non-institutional loans are revolver/term loan, term loan, and term loan A. Cluster standard errors that allow correlation within a borrower are used.

	1995-2000						2001-2006					
	Institutional loans			Non-institutional loans			Institutional loans			Non-institutional loans		
	Coef.	<i>t</i> -test		Coef.	<i>t</i> -test		Coef.	<i>t</i> -test		Coef.	<i>t</i> -test	
=1 if high write-down institution	24.85	0.49		73.55	1.29		271.89	2.81	***	-95.13	-0.55	
=1 if mix write-down institutions	1.30	0.07		69.70	4.18	***	-3.18	-0.14		22.09	0.38	
Number of private equity investors	-0.57	-0.62		0.16	0.31		-2.36	-0.33		-8.65	-1.06	
Ln(1+age of private equity investors)	-16.84	-1.53		0.46	0.05		22.40	1.59		-12.92	-0.45	
High write-down X private equity age	3.03	0.16		-19.82	-0.91		-85.78	-2.72	***	63.18	1.06	
Ln(1+borrowing company sales)	-9.21	-1.68	*	-2.93	-0.50		5.93	0.62		-10.78	-0.79	
Ln(1+age of borrowing company)	-3.12	-0.75		-1.93	-0.49		-3.83	-0.58		-11.57	-0.62	
=1 if borrower is a high-tech firm	12.36	0.96		20.03	1.47		5.56	0.30		-13.41	-0.34	
Ln(1+loan amount)	8.90	1.07		-20.91	-3.46	***	-42.69	-2.85	***	8.54	0.47	
Ln(1+loan maturity)	-1.04	-1.20		-0.61	-1.44		-3.08	-3.84	***	2.14	1.94	**
=1 if more than one lead arranger	-0.45	-0.03		4.45	0.38		11.52	0.61		-29.14	-0.75	
=1 if loan purpose is for LBO/takeover	-22.13	-1.73	*	32.39	2.93	***	7.13	0.49		87.28	1.98	**
Intercept	600.52	4.84	***	396.78	3.61	***	573.78	3.72	***	518.18	2.09	**
Adjusted R2	0.11			0.18			0.34			0.18		
Number of observations	205			279			312			181		
Number of clusters	125			195			194			132		

\*, \*\*, \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

**Table 7 Robustness test of regression analyses using subsample of institutional loans during post-bubble period (2001-2007) and without mix institution write-down**

This table uses sample that excludes loan deals lent by mix institutions. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Sample period starts from 1995 to 2006. The dependent variable is either covenants index or interest spread. Interest spread over LIBOR expressed in basis points is all-in-drawn spread, which includes interest cost over LIBOR and annual fees. Covenant index is defined as the sum of six covenant indicators, which are collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep. Institutional loans are term loan B, C, or D, which are sold to institutional investors. Non-institutional loans are revolver/term loan, term loan, and term loan A. Cluster standard errors that allow correlation within a borrower are used.

Dependent variable: Variables	Covenants index			Interest spread		
	Coef.	t-test		Coef.	t-test	
=1 if high write-down institution	-3.34	-2.20	**	290.63	2.68	***
Number of private equity investors	0.25	1.51		-10.44	-1.10	
Ln(1+age of private equity investors)	-0.58	-2.00	**	34.86	1.63	*
High write-down X private equity age	0.96	1.83	*	-91.66	-2.55	***
Ln(1+borrowing company sales)	0.35	2.06	**	7.73	0.61	
Ln(1+age of borrowing company)	-0.16	-0.87		-1.96	-0.23	
=1 if borrower is a high-tech firm	0.45	1.17		12.19	0.52	
Ln(1+loan amount)	0.49	2.83	***	-50.05	-2.88	***
Ln(1+loan maturity)	-0.01	-1.14		-3.46	-3.66	***
=1 if more than one lead arranger	0.70	1.73	*	23.12	1.14	
=1 if loan purpose is for LBO/takeover	0.23	0.59		-4.29	-0.23	
Intercept	-4.32	-1.37		567.77	2.93	***
Adjusted R2	0.19			0.38		
Number of observations	234			228		
Number of clusters	161			158		

\*, \*\*, \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.

**Table 8 Robustness test of regression analyses using subsample of institutional loans during post-bubble period (2001-2007) and controlling for bank mergers**

This table uses sample that excludes loan deals lent by pre-merger target institutions in bank mergers. Therefore, the write-down institutions only contains those did not engage in major bank mergers or the acquiring institutions. The loan deals consist of term loans lent to corporations during the year or within 5 years since the closest round of private equity investments. Only loans from major financial institutions (serving as lead arrangers) with write-down information are included in the analysis. The write-downs are mainly related to credit crisis from the beginning of 2007 to August 10, 2008. Write-down in percentage is scaled by aggregate loan amounts available in DealScan from 2001 to 2006. Institution with above (below) median percentage write-down is classified as a high (low) write-down institution. Mix institutions consist of both high and low write-down institutions serving as lead arrangers in the same deal. Sample period starts from 1995 to 2006. The dependent variable is either covenants index or interest spread. Interest spread over LIBOR expressed in basis points is all-in-drawn spread, which includes interest cost over LIBOR and annual fees. Covenant index is defined as the sum of six covenant indicators, which are collateral, dividend restriction, more than two financial covenants, asset sales sweep, equity issuance sweep, and debt issuance sweep. Institutional loans are term loan B, C, or D, which are sold to institutional investors. Non-institutional loans are revolver/term loan, term loan, and term loan A. Cluster standard errors that allow correlation within a borrower are used.

Dependent variable: Variables	Covenants index			Interest spread		
	Coef.	t-test		Coef.	t-test	
=1 if high write-down institution	-3.44	-2.54	***	267.82	2.74	***
=1 if mix write-down institutions	-0.50	-1.14		-2.68	-0.12	
Number of private equity investors	0.37	3.07	***	-1.91	-0.27	
Ln(1+age of private equity investors)	-0.57	-2.69	***	23.02	1.58	
High write-down X private equity age	1.02	2.21	**	-85.33	-2.69	***
Ln(1+borrowing company sales)	0.35	2.69	***	6.65	0.67	
Ln(1+age of borrowing company)	-0.14	-0.95		-2.83	-0.43	
=1 if borrower is a high-tech firm	0.44	1.34		4.59	0.24	
Ln(1+loan amount)	0.41	2.64	***	-44.66	-2.85	***
Ln(1+loan maturity)	-0.01	-1.18		-3.14	-3.89	***
=1 if more than one lead arranger	0.60	1.45		8.68	0.45	
=1 if loan purpose is for LBO/takeover	0.35	1.07		10.62	0.70	
Intercept	-4.26	-1.64	*	570.17	3.63	***
Adjusted R2	0.19			0.35		
Number of observations	312			306		
Number of clusters	194			191		

\*, \*\*, \*\*\* Significant at the 10, 5, and 1 percent levels, respectively, for a two-tailed test.