

# Loan Structure in the Leveraged Lending Market

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## Abstract

In this paper, I investigate the covenant characteristics of syndicated loans originated by financial institutions after the financial crisis. I first perform cross sectional regressions of loan characteristics on whether the loan is from a banking institution or a non-bank financial institutions. I find that loans originated by non-bank financial institutions have looser covenant structure and on average are one year shorter in maturity. I supplement this analysis with a text analysis of sample of credit contracts that were originated after 2010. I find that complexity of the loan contracts as proxied by the word count and topics identified by LDA is driven by lender specific variables, confirming press coverage on the differences in loan standards between banking and non-bank financial institutions. Finally, I calculate a cosine similarity distance between every contract pair according topics found by LDA analysis. I find that contracts are more similar when they have the same borrower and this effect is about ten times as strong as lender effects suggesting that lenders segment origination standards by borrower type.

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# 1. Introduction

In the aftermath of the Great Recession, the Federal Reserve kept interest rates close to zero leaving investors searching for higher yields in high-risk investments. One of these markets is the market for high-yield leveraged loans. Recently, the federal regulators have strengthened their supervision of these loans. The Interagency Guidance on Leveraged Lending was issued on March 21, 2013, jointly by the members of the Financial Stability Oversight Council (FSOC).

While regulated depository institutions may now find it more costly to do these types of deals, others institutions outside of the banking regulatory environment may step in and fill the void created by the retreating banks. There is a concern that the increased level of regulation in leveraged lending may push the riskiest loans into the so-called shadow banking system, where the regulatory oversight is less stringent. These “non-bank” institutions include mortgage brokers, insurance companies, private equity firms, and hedge funds. shows the percentage of syndicates where at least one non-bank financial institution was a lender. As can be seen, the percentage of deals where at least one non-bank is a participant on the deal is increasing in the cohort year. At the same time, there has been anecdotal evidence on the proliferation of “covenant-lite” deals in the leveraged loan market.

In this paper, I investigate the covenant characteristics of syndicated loans originated by financial institutions after the financial crisis. I perform two separate analysis. First, I use the leverage lending guidance issued by the Federal Financial Institutions Examination Council as a shock to the capacity of banks to originate loans with high loan-to-value ratios. The Thomson Reuters Dealscan dataset allows me to observe lending activities across banks and non-banks. I am particularly interested in investigating whether the leveraged lending guidance changed the contract terms due to the change in the participants in the syndicates. The results I find suggest that this can undermine macroprudential regulatory goals. In the second analysis, I use a natural language ap-

proach to analyze the level of detail and found in the defaults and covenants sections of a large sample of syndicated loan contracts. Here, I document that while borrower characteristics drive the complexity of loan contracts much more so than lender characteristics. Most importantly, contracts are more detailed when firms are more likely to default, loan maturity is longer, loan size is larger, lenders are physically distant from the firm, and when the existing financial structure is more complex.

The paper proceeds as follows. In Section , I will provide some institutional details on the leveraged loan market, briefly describes the leveraged lending guidance, and my sample of loan contracts. Section describes the data. Section outlines both of the empirical strategies. Section describes and discusses my results in detail. Finally, section concludes.

## **2. Institutional Details**

### ***2.1 Leveraged Loan Market***

The leveraged loan market generally consists of loans made to companies with credit ratings of “BB+” or lower. Market participants typically identify these loans as contracts that a priced at LIBOR plus 150 bps. Broadly syndicated loans represent the largest segment of the leveraged loan market though several unique market segments exist. Figure shows the various leveraged loan markets and their characteristics. This paper will focus on syndicated leveraged loans due to data availability constraints. Investors search for yield has played a major role in the growth of leveraged lending in the United States. In the first half of 2017 the amount of new leveraged loans issued reached a massive \$548 billion, the most ever for such a time period.

In the aftermath of the crisis, the OCC, the Fed and the FDIC issued guidance on leveraged lending. Prompted by an increase in leveraged lending and an apparent easing of credit standards, in March of 2013 these three institutions issued guidance to

banks on the appropriate origination of leveraged lending. In response to inquiries, the agencies issued a responses to frequently asked questions later in the year. The guidance and FAQ outlined minimum expectations on a wide range of topics related to leveraged lending, including underwriting and valuation standards, pipeline management, risk ratings and problem credit management. The stated goal of the guidance was to ensure that federally regulated financial institutions conduct leveraged lending activities in a safe and sound manner. To that end, the agencies outlined in the guidance a set of minimum expectations on a wide range of leveraged loan issues, including underwriting and valuation standards, pipeline management, risk rating of leveraged loans, and credit analytics.

## ***2.2 Sample of Loan Contracts***

The Security and Exchange Commission requires publicly listed firms to disclose any new and updated loans in financial statements supplied to the SEC. Within the annual financial statement (10-K), exhibit 10 is where the text of the credit agreement would be placed. I download these forms for a random and representative sample of credit agreements from 2010 to 2015. I describe the sample in the data section below.

# **3. Data**

## ***3.1 Leveraged Loan Data***

I use Thomson Reuter's Dealscan database of business loans to gather information on leveraged loan originations and the identity of the lenders. I also use it to investigate non-bank lenders' participation in lending syndicates. Dealscan is dominated by syndicated loans. It contains detailed information on individual loans, including the loans spread over LIBOR, maturity, seniority status, purpose and type; the borrower, includ-

ing its sector of activity and its legal status (private or public firm. I use loan spreads to identify leveraged loans since the majority of loans are to private companies and thus I do not have visibility into their financial statements. My definition of a leveraged loan is that the facility is a term loan with spreads over LIBOR greater than 200 bps at origination. I focus on this threshold because in the dataset the majority of loans with spreads above this number are firms that are below investment grade.

### **3.2 *Leveraged Loan Texts***

For second analysis, I use a sample of credit agreement texts which comes from ?, who searched in the SEC credit agreement database based on results found in the Dealscan loan database. I manually extract two types of sections. First, I extract the sections that specify technical defaults to obtain a document corpus of 3294 defaults sections. Second, I extract the sections that list the covenants to obtain a document corpus of 2522 covenants sections. Finally, I split the documents into individual clauses. To extract the clauses, I wrote a program that divides up each section (defaults and covenants) to a sequence of listed items that have independent ideas. This can be easily done since since almost all loan contracts follow a standard agenda style format. Thus, I can separate each document into a series of nested items. I further try to ensure that the level of encapsulation is reasonably uniform and the number of encapsulation is sparse. I identify documents that have limited number of levels and use that as a guide for the parsing of other documents.

## **4. Empirical Strategy**

## 4.1 Regression Analysis

In the first part of my analysis, I will estimate variants of the following regression model:

$$Y_{ijt} = \beta_0 + \beta_1 NonBank_{ijt} + X_{ijt} + \gamma_i + \delta_t \quad (1)$$

where  $i$  indexes the firm,  $j$  indexes the loan, and  $t$  indexes the time period.  $NonBank_{ijt}$  is a variable that measures non-bank finance companies participation in the syndicate for the  $j$ th loan that firm  $i$  borrowed.  $NonBank_{ijt}$  can take two forms: a simple indicator variable if there is a non-bank syndicate member or the proportion of the syndicate that is classified as a non-bank finance company.  $Post_t$  is an indicator variable for the time period after the Federal Reserve issued the leverage lending guidance. This variable controls for the change in the structure of the market after the guidance was announced.  $X_{ijt}$  is a vector of firm level controls (e.g. total assets, leverage, return-on-assets). Time fixed effects and firm fixed effects is indicated by  $\delta_t$  and  $\gamma_i$ , respectively.  $Y_{ijt}$  can be a host of outcome variables related to the strictness of the covenant structure of the loans such as the number of covenants, the number of unique performance metrics used, and the convexity of the loans pricing grid. For the results presented here I examine specifically the loan terms, the occurrence of dividend restrictions, and the incidences of general covenant. I do this for loans with any non-bank participant and loans where non-banks syndicate with a large and systemically important bank.  $\beta_3$  captures the effect of having non-bank participants in a leverage loan after the Fed issued its leverage lending guidance. Given anecdotal evidence, I hypothesize that  $\beta_3$  will be negative and statistically significant indicating that having non-bank participants in a leveraged loan deal will lead to looser covenant structures.

## 4.2 Text Analysis

Individual phrases in the defaults sections (covenants sections) hold the specified events of default (covenant violation). I construct an alternative measure for the number of distinct events of default or covenants due to the fact that the text may contain unimportant information to identify default or covenant violation events. I construct this measure by determining the “main topic” of each clause and then counting the number of unique topics for default or covenant component. These topics are determined by probabilistic topic models that help discover the themes in a sample of text documents. I use the Latent Dirichlet Allocation (LDA) model, which they describe as the “simplest topic model”. These models have been recently used in finance related research (see ) as a tool for analyzing text-based data.

After applying LDA to the text corpus, I calculate the distance across loans in terms of topics. The distance between the loan documents gives me a measure of how similar one loan contract is from another, and by extension, how similar the unique writing of a given contract is relative to the rest of the sample. For my measure of distance between two loan documents  $i$  and  $j$ , I use the cosine dissimilarity as a measure of distance between two document and this is my outcome variable of interest. I then perform the following regression:

$$ContractDistance_{ct} = \beta_0 + \beta_1 BorrowerIndicator_{ct} + \beta_2 LenderIndicator_{ct} + \beta_3 LoanSizeIndicator_{ct} \quad (2)$$

where the index  $c$  indicates contract pairs. The indicator variables turn on when the loan contracts share those characteristics. For example,  $BorrowerIndicator_{ct}$  variable is equal to 1 if the loan contract pair has the same borrower and the  $LenderIndicator_{ct}$  variable turns on when the loan contract pair has the same lender.

## 5. Results

### 5.1 *Loan Covenant Feature Results*

Table 1 reports the results of the first analysis where I examine the differences in loan characteristics for loans originated by banks versus non-banks. The top panel compares, for borrowers from banks to non-banks after 2013, the covenant characteristics of their last loan from a bank with their first loan from the non-bank. The bottom repeats the same analysis but restricts to borrowers that switch from systemically important banks, as defined by the Financial Stability Oversight Council, to non-bank financial institutions. Although the results from the bottom panel are statistically weaker, the coefficient on  $NonBank_{ijt}$  is significant in both the top and the bottom panels. According to my results, non-banks have lower probability to demand that borrowers collateralize but they are more likely to impose dividend restrictions on borrowers. Additionally, they tend to extend loans with shorter maturity when compared to banks. In the reported results, I do not control for the loan spread because this variable determined by lenders at the same time as the aforementioned features. However, even when I add loan spreads into the regression, the results do not change.

### 5.2 *Text Analysis Results*

I supplement the above regressions by using Latent Dirichlet Analysis to examine whether borrowers or lenders determine the loan contract provisions (covenants). The cosine distance can be calculated for each loan contract pair using the topics identified for each contract using LDA. I then regress the obtained distance for each contract pair on a series of dummy variables for whether the the pair of contracts is to the same firm, issued by the same bank, or issued in the same time period.

I first present the summary statistics for the text corpus in Table 2. I find that average number of words in each loan contract is around 527, with about half of that being



unique words. I find that the average number of topics as identified by LDA is around 12. Finally, the number of distinct clauses is around 14 with the average clause length being 40 words.

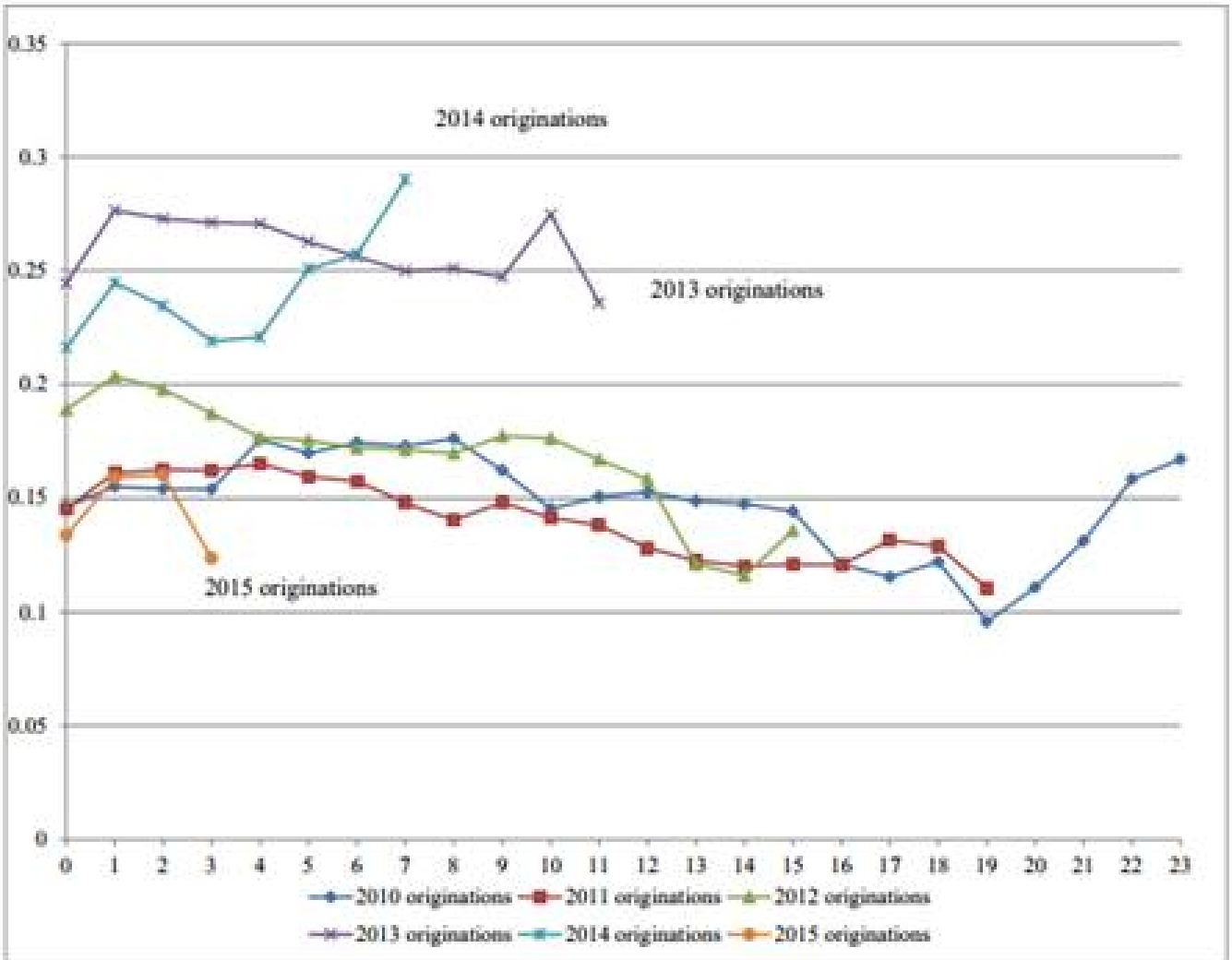
I present results for the analysis in Tables 3. The mean cosine distance is around 0.3-0.5 for all four regression, which a standard deviation of around 0.12. Column one presents the results for the full sample, with indicators for loans made to the same borrower, loans made from the same lead lender, loans made during the same year, and loans made to borrowers in the same industry. While each of these indicators is statistically significant, the same borrower indicator is an order of magnitude larger than the same lead lender indicator, being about 6 to 10 times larger in the case of word distance and 4 to 5 times larger in the case of main topic distance. This result contradicts the common notion that banks offer boilerplate terms in a covenants section.

Finally, I examine the determinants of loan contract complexity. To achieve this, I regress the complexity measures on the word count, number of unique words, industry specific words, and the number of clauses on firm-level and loan-level measures of stake size, information, and lagged measures of business complexity. Table 4 presents the results. I find that higher firm leverage and higher earnings volatility are associated with more detailed covenants sections in each loan. Furthermore, increasing the log loan amount by two standard deviations increases contract word detail by around 26% in the covenants section. Firm size as proxied by total assets is positively associated with contract complexity.

## **6. Conclusion**

In this paper, I investigate the covenant characteristics of syndicated loans originated by financial institutions after the financial crisis. I first perform cross sectional regressions of loan characteristics on whether the loan is from a banking institution or a non-

bank financial institutions. I find that loans originated by non-bank financial institutions have looser covenant structure and on average are one year shorter in maturity. I supplement this analysis with a text analysis of sample of credit contracts that were originated after 2010. I find that complexity of the loan contracts as proxied by the word count and topics identified by LDA is driven by lender specific variables, confirming press coverage on the differences in loan standards between banking and non-bank financial institutions. Finally, I calculate a cosine similarity distance between every contract pair according topics found by LDA analysis. I find that contracts are more similar when they have the same borrower and this effect is about ten times as strong as lender effects suggesting that lenders segment origination standards by borrower type.



**Figure 1:** This graph plots the percentage of deals where a non-bank financial institution was a participant. The plot shows results across cohort year.

## Defining the Loan Markets

	Investment Grade	Leveraged Loans		
		Broadly Syndicated/ Large Corporate	Middle Market	Direct Lending
Sales Size	\$9 Bil. +	\$500 Mil.–\$7 Bil.	< \$500 Mil.	Varies Widely
EBITDA Size	\$2 Bil.–\$45 Bil.	\$300 Mil.–\$2 Bil.	< \$100 Mil.	Varies Widely
Ratings	> BBB–	< BB+	< BB+, Unrated	< B+, Unrated
Average Deal Size	> \$1 Bil.	\$500 Mil.	\$75 Mil.	Varies Widely
Structure	RCFs TLs	RCFs TLs	RCFs TLs Unitranche	TLs Unitranche
Security	Unsecured	Secured	Secured	Secured
Average Tenor	1–5 years	3–7 years	3–6 years	3–7 years
Secondary Liquidity	Yes	Yes	Limited	None
Syndication Method	Broad	Broad	Broad Club	Club No Syndication
Lenders	Banks	Banks	Banks Specialty Finance	Specialty Finance
Main Investors	Retails Funds Insurance Companies Pension Funds	Banks Retail Funds CLOs	Specialty Finance CLOs Private Equity	Specialty Finance Private Equity

RCF – Revolving credit facility. TL – Term loan. Note: Figures based on Fitch estimates.  
Source: Fitch Ratings.

**Figure 2:** This table shows the characteristics of a syndicated leveraged loan.

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**Table 1**

*This table presents the results for the analysis of loan characteristics for loans issued by bank lenders versus loans issued by non-bank lenders*

Panel A: All Banks			
	<b>Collateralized</b>	<b>Dividend</b>	<b>Log of Maturity</b>
Non-bank	-3.918*** (-3.26)	3.661** -2.27	-1.801*** (-4.81)
Constant	-2.445*** (-2.87)	1.223 -0.94	4.870*** -24.27
Observations	235	209	246
R-squared	0.09	0.256	0.364

Panel B: Systemically Important Banks			
	<b>Collateralized</b>	<b>Dividend</b>	<b>Log of Maturity</b>
Non-bank	-3.437* (-1.81)	3.305 -1.56	-1.931*** (-3.77)
Constant	-1.658 (-1.33)	0.522 -0.31	6.215*** -16.46
Observations	113	102	119
R-squared	0.098	0.234	0.3

**Table 2***This table present summary statistics for the complexity measure of each contract*

<b>Full Sample</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Words (unigrams)	527	132.5	128	1308	2481	1272	252	9245
Unique words (unigrams)	212	37.1	61	356	514	121.6	139	928
Terms and phrases (full dictionary)	541	138.1	116	1348	2664	1353.6	291	9554
Terms and phrases (finance)	223	59.2	41	483	1195	631.9	105	4769
Clauses	14	3	5	29	27	8.9	5	69
Average Length of Clauses	40	13.2	9.5	518	96	71.7	16.8	2270
Main topics (full)	12	2.1	5	19	18	3.9	5	26

<b>Renegotiated Loans</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Words (unigrams)	565	251.5	62	3437	4070	6224.2	303	6644
Unique words (unigrams)	221	50.8	40	586	598	230.5	151	2107
Terms and phrases (full dictionary)	580	263.1	71	3628	4294	6211.4	341	65920
Terms and phrases (finance)	239	117.5	29	1659	1967	2931.6	132	30718
Clauses	14	3.7	5	27	32	19.3	9	187
Average Length of Clauses	42	21	15.2	285	117	97.2	3.1	1036
Main topics (full)	12	2.4	4	19	13	9.2	5	28



**Table 3**

*This table present results for the regression of pair wise similarity between two loan contracts on various indicator variables for the same borrower, lender, origination period, and loan size.*

	(1)	(2)	(3)	(4)	(5)
Same Borrower	-0.201*** (-23.51)	-0.212*** (-23.73)	-0.205*** (-23.69)	-0.125*** (-9.55)	-0.129*** (-6.77)
Same Lender	-0.0376*** (-21.48)	-0.0317*** (-17.21)	-0.0322*** (-17.66)	-0.0522*** (-16.03)	-0.0747*** (-8.19)
Same Year	-0.000889** (-1.99)	-0.000792 (-1.40)	-0.00109* (-1.96)	-0.00082 (-1.45)	0.00110** (-1.97)
Same Borrower Industry	-0.000324 (-0.14)	-0.000218 (-0.09)	-0.00105 (-0.42)	-0.000248 (-0.10)	-0.00104 (-0.41)
Greater Than 100M		-0.00709*** (-3.21)		-0.00786*** (-3.55)	
Greater Than 100M × Same Borrower				-0.109*** (-6.87)	
Greater Than 100M × Same Lender				0.0237*** (-6.65)	
Same Lenders			-0.0204*** (-7.26)		-0.0211*** (-7.52)
Multiple Lenders × Same Borrower					-0.0803*** (-3.86)
Multiple Lenders × Same Lender					0.0432*** (-4.65)
Observations	3054156	1657482	2145829	1657482	2145829
R	0.202	0.175	0.184	0.175	0.184

**Table 3**

*This table present results for the regression of loan contract complexity on explanatory variables for firm and loan characteristics*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total Words	Unique Words	Law	Finance	Full Dictionary	#Clauses	#Main
log(Loan Size)	13.95*** (3.02)	3.830*** (2.92)	13.07*** (2.80)	5.498*** (2.63)	13.41*** (2.78)	0.118 (1.20)	0.0741 (1.03)
log(Maturity)	10.63** (-2.1)	3.568** (-2.49)	10.88** (-2.14)	4.245* (-1.91)	10.78** (-2.05)	0.149 (-1.42)	0.192*** (-2.60)
Repeat Lender	-6.421 (-1.22)	-0.896 (-0.60)	-6.923 (-1.31)	-1.578 (-0.68)	-6.901 (-1.26)	-0.0776 (-0.72)	-0.0294 (-0.37)
Multiple Lenders	44.45*** (-4.71)	10.61*** (-3.98)	42.60*** (-4.49)	17.51*** (-4.26)	43.77*** (-4.46)	0.360* (-1.79)	0.432*** (-3.1)
Lender <100 miles away	-16.08** (-2.04)	-3.691 (-1.63)	-15.66** (-1.98)	-6.937* (-1.94)	-16.96** (-2.08)	-0.351** (-2.21)	-0.304** (-2.58)
Segment Concentration	-1.978 (-0.16)	-0.173 (-0.05)	-2.288 (-0.19)	-1.367 (-0.26)	-2.695 (-0.21)	0.0358 (0.15)	0.0999 (0.58)
log(Assets)	-13.44*** (-3.13)	-4.914*** (-3.83)	13.78*** (-3.19)	5.344*** (-2.76)	-13.95*** (-3.12)	0.460*** (-5.04)	0.257*** (-3.75)
log(Age)	-8.838** (-2.20)	-1.865 (-1.63)	-8.806** (-2.18)	-3.212* (-1.75)	-9.036** (-2.15)	-0.0855 (-1.07)	-0.0958 (-1.59)
Leverage Ratio	22.21 (1.23)	3.389 (0.67)	24.69 (1.36)	12.41 (1.53)	24.50 (1.30)	0.883** (2.25)	0.587** (2.14)
Observations	2,607	2,607	2,607	2,607	2,607	2,607	2,607
R-Squared	0.146	0.141	0.144	0.124	0.142	0.259	0.199
Year FE	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y