Managerial Ownership of Debt

XIN, Xiangang

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy
in
Accountancy

The Chinese University of Hong Kong
August 2011

Thesis/Assessment Committee

Professor Danqing Young (Chair)
Professor Oliver M. Rui (Thesis Supervisor)
Professor Cong Wang (Thesis Co-Supervisor)
Professor George Yong Yang (Committee Member)
Professor Hong Zou (External Examiner)

Abstract of Thesis Titled:

Managerial Ownership of Debt
Submitted by Xin Xiangang
For the degree of Doctor of Philosophy in Accountancy
at The Chinese University of Hong Kong in Aug, 2011

Abstract:

Debt holding by managers, i.e., inside debt, aligns the incentives of managers more closely with those of debtholders, reducing agency costs of debt (Jensen and Meckling (1976) and Edmans and Liu (2011)). My thesis investigates the effect of managerial ownership of debt on corporate risk-taking, bank loan contracting, and accounting conservatism.

In the first chapter I examine the effect of managerial ownership of debt on agency costs of debt problems related to risk-taking. I find that higher managerial ownership of debt implements lower corporate risk-taking, in terms of less investment in R&D, more investment in capital expenditures, and more corporate diversification. The role of inside debt in moderating risk-taking is more pronounced in firms with high level of default risk. These findings suggest that managers with large inside debt holdings are less likely to pursue risky projects that potentially transfer wealth from debtholders to shareholders.

In the second chapter I examine how terms of bank loans are related to managerial ownership of debt. Specifically, the analysis uncovers significant evidence of lower loan spreads for firms with larger debt ownership by CEOs. The negative relation is more pronounced when creditors face higher expropriation risk and when the CEO's expected retirement horizon is beyond loan maturity. I also find that loans to firms with larger managerial debt holdings are associated with smaller lending syndicates, fewer covenant restrictions, and less collateral requirement, consistent with lenders anticipating lower expropriation risk at these firms.

In the third chapter I examine the relation between accounting conservatism and managerial ownership of debt. Consistent with debt holdings by managers mitigating the debtholder-shareholder conflicts and reducing debtholders' demand for accounting conservatism, I find significant evidence of less conservative financial reporting at firms whose CEOs have accumulated more deferred compensation and pension benefits. This negative relation is more pronounced in firms with higher expected agency costs of debt and in firms that can credibly commit to a higher level of conservatism if required by debtholders. These findings are robust to using a number of alternative accounting conservatism measures and to correcting for potential endogeneity of managerial ownership of debt.

Keywords: Managerial ownership of debt, Agency costs of debt, Risk-taking, Bank loan contracting, Accounting conservatism

摘要:

管理层持有企业债权可以让管理层的利益与债权人的利益更加一致，从而减少债务代理问题(Jensen and Meckling (1976) and Edmans and Liu (2011))。在本论文中，我主要从三个方面研究管理层持有债权对企业行为的影响：投资风险，银行贷款契约，会计稳健性。

论文的第一章主要研究管理层持有企业债权对企业风险投资的影响。研究发现当管理层持有较多的债权时，这些企业往往采取更稳健的投资策略，比如更少进行研发投资，更多进行资本投资，企业投资更加分散。管理层持有企业债权与企业风险投资的负相关关系在企业面临高违约风险时更加显著。这些研究结果表明管理层持有企业债权可以降低管理层进行高风险投资的动机。

论文的第二章主要研究管理层持有企业债权对银行借款的影响。研究发现当管理层持有较多企业债权时，企业银行借款的成本较低。而且这一关系在企业面临较高的违约风险，以及管理层任期超过债务期限时，更加显著。研究进一步发现管理层持有较多企业债权时，企业的贷款合同有更少的条约约束，更少的抵押条款等等，这些贷款合同特征进一步表明银行预期这些企业的违约风险较低。

论文的第三章主要研究管理层持有债权对企业会计报告稳健性的影响。管理层持有企业债权可以降低债务代理问题，进而减少债权人对企业会计报告稳健性的需求。相应的，本文发现管理层持有较多债权时，企业会计稳健性显著降低。这一负相关关系集中在债务代理问题较严重的企业和更加依赖债务融资的企业。另外，本文采用不同的变量来计量会计稳健性仍发现类似的结果。

关键词: 管理层债权，债务代理问题，企业风险投资，银行贷款，会计稳健性

Acknowledgements

My deepest gratitude goes to my supervisor, Professor Cong Wang, for his continuous support, which enabled me to develop an understanding of the ingenious world of research. Without their guidance, experience, knowledge and wisdom, this thesis would not be what it has become today. I would also like to express my sincere appreciation for the invaluable time and comments of my other committee members, Professor Hong Zou, Professor Danqing Young, Professor Oliver M. Rui and Professor George Yong Yang. Any errors in this thesis are strictly my own.

I appreciate my friendship with my fellow doctoral students. With their fellowship, PhD study is not a lonely process.

Special thanks go to my wife, who has stood by me through many years with love, patience and extraordinary courage. Special thanks also go to my parents, for their unconditional love and support.

Table of Contents

INTRODUCTION

Conventional wisdom holds that CEO compensation mainly comprises cash and equity based compensation. Equity based compensation plays an important role in managing the slope and convexity of the relation between stock price and managers' wealth (e.g., Jensen and Meckling (1976), Smith and Stulz (1985), Guay (1999), and Coles, Daniel and Naveen (2006)). A branch of studies investigate the managerial incentive effects of equity based compensation and establishes a large body of evidence on whether managerial stock and stock option ownership impact firm performance, shareholder and debtholder value, and specific corporate decisions and policies.[1] However, one byproduct of extensive use of equity based compensation is that it may exacerbate the agency conflicts between debtholders and shareholders (Jensen and Meckling (1976) and John and John (1993)).

Although receiving much less academic attention, debt-like compensation, i.e., inside debt, provides an inexpensive way to eliminate a large part (perhaps all) of the agency costs of debt (Jensen and Meckling (1976, pp. 352)). Specifically, when managerial ownership of debt as a fraction of total firm debt is larger than the fraction of equity holding to total equity, managers would even have incentives to alter the operating characteristics of the firm to transfer wealth from shareholders to the debtholders. Despite the early insight from Jensen and Meckling (1976), in the past three decades research on inside debt has been almost nonexistent due to limited reporting requirements. A comprehensive Securities and Exchange Commission (SEC) disclosure reform in 2006 greatly enhanced the transparency of managers' pensions and deferred compensation.

The defined benefits pension and deferred compensation that managers accumulate over their tenure are largely unsecured long-term claims against firm assets, and as such, are similar to

[1] See Core, Guay, and Larcker (2003) for a review of the literature.

debt (Sundaram and Yermack (2007)). Pension benefits may sometimes be negotiated, but they usually accrue to managers under company-wide formulas established by each firm, often based upon each executive's years of service and average level of cash compensation. When an executive retires, he can draw the pension in the form of a life annuity or as a single lump sum, equal to the actuarially calculated present value of expected lifetime benefits. Deferred compensation, in contrast, accrues if the executive makes a discretionary investment decision that involves him lending money back to his firm by foregoing cash compensation that he would otherwise be entitled to receive in the current period (in some cases, these deferral decisions are mandatory). Deferred compensation may often be invested either at a fixed rate of return, or in the company's stock, or in a menu of stock or bond mutual funds chosen by the firm. Deferred compensation is generally paid out to the executive at retirement, while earlier withdrawals are permitted by some firms under certain limited circumstances.[2] In addition to the incentive implications of these plans, a major motivation for executives to receive inside debt compensation is that its taxation is almost always deferred until the executive receives payouts when retired (Wei and Yermack (2011)).

Managerial ownership of debt is widespread. For instance, by the time Jack Welch retired as the CEO of General Electric in 2001, the present value of his pension benefits plus deferred compensation is estimated to have exceeded $109 million. Sundaram and Yermack (2007) document that for the 61-65 age CEOs group the pension component of overall compensation is on average 40% larger than the base salary and is 23% of the size of equity compensation. Wei and Yermack (2011) find among all firms in their sample around 30% of them have CEO personal leverage (CEO debt based compensation divided by equity based compensation) larger than firm leverage (firm debt divided by equity).

Managerial ownership of debt aligns the interests of managers more closely with those of

[2] In other cases, early withdrawal of deferred compensation usually causes a hefty penalty (Wei and Yermack (2011)).

debtholders. When firms file for bankruptcy, CEOs (and possibly other senior executives) will stand in line with other creditors for resolution of the bankruptcy and recovery of any value on their defined-benefits pension and deferred compensation claims. Since defined-benefits pensions and deferred compensation are almost always unfunded and unsecured (Sundaram and Yermack (2007)), their value bears a positive relation to firms' liquidation value in bankruptcy.[3] As a result, they provide managers with incentives to not only avoid bankruptcy but also increase the liquidation value in bankruptcy, which is exactly what creditors prefer. In contrast, cash based compensation encourages managers to avoid bankruptcy since they are paid only in solvency, but they do not induce managers to increase liquidation value in bankruptcy. Finally, Inside debt can do more fully than debt covenants in mitigating agency costs of debt since debt contracts are usually incomplete (Edmans and Liu (2011)).

Several recent studies begin to examine managerial ownership of debt. Based on the voluntary disclosure of a sample of Fortune 500 companies from 1996 to 2002, Sundaram and Yermack (2007) conduct the first empirical investigation of inside debt by studying CEO pension plans. They document that for many CEOs the annual increase in the actuarial value of pension benefits represents a significant portion of their total compensation. They also find that CEOs with larger pension values take less risk as captured by a distance-to-default measure.

More research follows after the SEC adopted in 2006 enhanced disclosure requirements that made systematic data on executive pensions and deferred compensation available. Wei and Yermack (2011) investigate stockholder and bondholder reactions to initial disclosures of CEO inside debt holdings in early 2007. They find that upon revelation of large inside debt positions,

---

[3] See Wei and Yermack (2011) for a few cases of executives losing their pensions and deferred compensations when their firms file for bankruptcy: For example, in the high-profile bankruptcies of General Motors and Chrysler in 2009, news reports indicated that GM's executive pension payments would be reduced by approximately two-thirds, while Chrysler's would disappear almost entirely. See, for example, "Ex-GM CEO Wagoner Retires with Reduced Benefits," Reuters, July 14, 2009, and Joseph Szczesny, "Iacocca among 450 Former Execs Suing Daimler, Cerberus Over Lost Pensions," The Oakland Press, September 11, 2010. A recent story reporting the wipeout of executives' deferred compensation claims in bankruptcy is Peg Brickley, "Nortel Moves to Retrieve Retirement Savings," The Wall Street Journal, December 23, 2010.

bond prices increase, stock prices decrease, and the volatility of both types of securities declines. Tung and Wang (2010) focus on banks and find that inside debt holdings by bank CEOs are negatively related to bank risk taking during the Global Financial Crisis. Overall, the empirical evidence on inside debt supports the view that managerial debt holdings align the incentives of managers and debtholders and alleviate debtholder concerns about expropriation, thereby reducing agency costs of debt.

Based on the theoretical development and empirical findings in the literature, I try to investigate the relation between managerial ownership of debt and three respects of corporate activities, respectively. First, I examine the effect of managerial ownership of debt on agency costs of debt problems related to risk-taking. I find that higher managerial ownership of debt implements more conservative corporate policies, in terms of less investment in R&D, more investment in capital expenditures, and more corporate diversification. I then examine how terms of bank loans are related to managerial ownership of debt. I find that loans to firms with larger managerial debt holdings are associated with lower loan spreads, smaller lending syndicates, fewer covenant restrictions, and less collateral requirement, suggesting lenders anticipating lower expropriation risk at these firms. I further examine the relation between accounting conservatism and managerial ownership of debt. Consistent with debt holdings by managers mitigating the debtholder-shareholder conflicts and thereby reducing debtholders' demand for accounting conservatism, I find significant evidence of less conservative financial reporting at firms whose CEOs have accumulated more deferred compensation and pension benefits.

The remainder of my thesis is organized as follows. Chapter 1 shows the effect of managerial ownership of debt on corporate risk-taking. The effect of managerial ownership of debt on bank loan contracting is examined in chapter 2. And in chapter 3 I investigate the effect of managerial ownership of debt on accounting conservatism. The last section concludes.

CHAPTER ONE MANAGERIAL OWNERSHIP OF DEBT AND CORPRATE RISK-TAKING

1. Introduction

In this chapter, I test the theoretical prediction of Jensen and Meckling (1976) and Edmans and Liu (2011) by examining the effect of managerial ownership of debt on classic agency costs of debt problem related to risk-taking.[4] If managerial ownership of debt aligns the interests of managers with those of debtholders, I expect managers with large inside debt positions are less likely to pursue risky projects. Moreover, Shareholders can only gain at the expense of debtholders, e.g., by pursuing risky projects, when the default risk is non-trivial (Jensen and Meckling (1976) and Myers (2001)). I also expect the role of inside debt in dampening risk-taking activities is more pronounced for firms facing non-trivial default risk.

To test these hypotheses, I follow Jensen and Meckling's theoretical development and construct a relative leverage measure for a borrowing firm's CEO to capture her incentives to engage in asset substitution activities.[5] The CEO's relative leverage is equal to her personal debt-equity (D/E) ratio relative to her firm's D/E ratio, where the CEO's personal D/E ratio is equal to the value of her inside debt holding divided by the value of her stock and option holding. The lower the CEO's relative leverage, the more incentive she has to expropriate debtholders. To

[4] Other agency costs of debt problems include unwarranted distributions to shareholders, issuance of higher priority debt claim, and investments in negative net present value projects, and underinvestment problem (Jensen and Meckling (1976), Myers (1977, 2001), Smith and Warner (1979)).

[5] As Jensen and Meckling (1976) show, a CEO's incentive to engage in asset substitution to expropriate debtholders to benefit shareholders is determined by whether she holds the same proportion of company debt as she does company equity. This theoretical insight suggests that when the CEO's personal D/E ratio is lower than her firm's debt-equity or leverage ratio, she has incentives to transfer wealth from debtholders to shareholders, and her incentives would reverse when her personal D/E ratio is higher than the firm's D/E ratio. Therefore, to capture managerial incentive to engage in asset substitution, I construct a relative D/E measure between the CEO and the company.

mitigate measurement error problem I also construct an indicator variable, which equals one if CEO relative leverage is larger than one and zero otherwise to capture CEO incentives. When the indicator variable is equal to zero, i.e., CEO personal D/E ratio smaller than firm's D/E ratio, the CEO may have more incentives to transfer wealth from debtholders to shareholders.

Following prior literature (e.g., Coles, Daniel, and Naveen (2006)), I measure corporate risk-taking in two respects, i.e., investment policy and corporate focus. Specifically, more R&D expenditures or less capital expenditure (CAPEX) represents risky investment policy. Increased corporate focus, e.g., fewer business segments, or higher Herfindahl index for sales across segments, stands for more corporate risk-taking.

Since firms are not required to report pension and deferred compensation information prior to December 2006, only three years data of inside debt over the period 2006-2008 are available. Using a sample of 2,350 observations, after controlling for a wide array of determinates of corporate risk-taking policies I find that higher managerial ownership of debt implements more conservative policies, in terms of less investment in R&D, more investment in CAPEX, and more corporate diversification, suggesting inside debt dampens corporate risk-taking incentives. Moreover, using expected default frequency (EDF) as a measure of default risk,[6] I find the role of inside debt in moderating corporate risk-taking is more pronounced in firms with higher level of default risk.

The endogeneity of CEO inside debt is a big threat to the causation between managerial ownership of debt and corporate risk-taking. Coles, Daniel, and Naveen (2006) argues that causation between CEO incentives and corporate risk-taking policies is likely to run in both directions, thereby it's critical to account for how policy choices and characteristics of the compensation scheme are jointly determined. As the first remedy, I address the endogeneity problem using a standard two-stage least squares (2SLS) approach where I instrument CEO

[6] The EDF is a default probability measures based on Merton's (1974) distance to default model and we obtain each firm's EDF using the program provided by Bharath and Shumway (2008).

relative leverage by personal income tax rate and Gibbs estimate of trading costs. As the second try, I adopt the simultaneous equations models to further isolation the effect of corporate risk-taking policies on CEO compensation structure. The results from these two approaches suggest that the significantly negative effect of CEO relative leverage on corporate risk-taking continues to hold after addressing the endogeneity problem.

To mitigate the measurement error of CEO relative leverage, I use an indicator measure, Higher relative leverage, to capture the inside debt positions of CEOs. This measure is free of influence of extreme values of CEO relative leverage. Similar empirical results emerge when continuous CEO relative leverage measure is replaced by High relative leverage, suggesting the findings are not influenced by measurement error problem.

In my last enquiry of the relation between CEO relative leverage and corporate risk-taking, I examine whether CEO relative leverage influence firm stock return volatility. To the extent firm investment policy, and firm focus policies capture different respects of risk-taking activities of a firm, stock return volatility captures a firm's overall risk-taking. The empirical evidence suggests a significantly negative correlation between CEO relative leverage and stock return volatility.

Overall, in this chapter I find robust evidence that when managerial ownership of debt is high, managers tend to pursue less risky projects, in terms of more CAPEX investment, less R&D investment, and lower firm focus corporate policy. This study provides supportive empirical evidence to the existing theoretical work (Jensen and Meckling (1976) and Edmans and Liu (2010)), which suggests CEO inside debt aligns the interests of managers with those of debtholders and serves as an efficient mechanism in mitigating agency costs of debt.

The remainder of the chapter is organized as follows. Section 2 reviews related literature and develops hypotheses. Section 3 discusses sample construction and variable definitions. Section 4 presents the empirical results. Section 5 concludes.

2. Literature review and hypotheses

2.1. Prior literature

My study is related to two recent studies on CEO compensation and bank performance during Global financial Crisis. Fahlenbrach and Stulz (2010) find banks with CEOs whose incentives are aligned with those of shareholders performed worse during the Global Financial Crisis and no association exists between CEOs option compensation and bank performance. Whereas, Tung and Wang (2010) find CEO's inside debt holdings are positively related with bank performance and negatively related with bank risk-taking during the Global Financial Crisis, suggesting the role of CEO inside debt in mitigating agency costs of debt becomes more pronounced during adverse economic conditions. These two studies together suggest the important role of CEO inside debt in mitigating agency costs of debt. My study extends Tung and Wang (2010) study to common industrial firms by showing the role of inside debt in mitigating agency costs of debt related to risk-taking.

Moreover, Sundaram and Yermack (2007) shows that when the CEO's D/E ratio exceeds the firm's D/E ratio, the firm's default risk measured as the distance-to-default significantly declines. My study both differs from and complements their investigation in several respects. First, while their results imply that debt holding by CEOs reduce the likelihood of default, my study directly investigates the effect of CEO inside debt on corporate risk-taking activities, in terms of investment policy, firm focus and financial policy, and thus specifies the channels through which CEO inside debt influence default risk. Second, they use a small sample and estimate pension values in their study. Data for their study comes from 237 firms drawn from the 2002 Fortune 500 ranking of the largest US companies.[7] The broader sample in my study may provide more general evidence on the effect of inside debt. Third, my study shows comprehensive

[7] As they noted, the results of their study should be interpreted with some care since the incidence of CEO pension plans is significantly higher than other S&P 500 firms.

evidence that the effect of CEO inside debt on corporate risk-taking is robust to a wide array of controlling variables, alternative measures of CEO inside debt, after addressing the endogeneity problem, further complementing Sundaram and Yermack (2007) study.

Lastly, Coles, Daniel, and Naveen (2006) investigate the relation between managerial equity based compensation (stock options) and corporate risk-taking, in terms of investment policy, debt policy, and firm risk. They find higher sensitivity of CEO wealth to stock volatility (vega) implements riskier policy choices, including relatively more investment in R&D, less investment in CAPEX, more focus, and higher leverage after controlling for CEO pay-performance sensitivity (delta). I extend their study by investigating another important component of CEO compensation, pension and deferred compensation.

2.2. Hypotheses

Since managerial ownership of debt aligns the interests of managers with those of debtholders, I expect managers with large inside debt positions are less likely to pursue risky projects. Specifically, R&D expenditures are high risk investment compared to capital expenditures (Kothari, Laguerre, and Leone (2001)). If managers have incentives to avoid taking risky projects, they would allocate the resource of the firm from R&D expenditures to capital expenditures. Therefore, managers who have large inside debt positions are expected to invest more in CAPEX and less in R&D. Moreover, diversification is viewed to be one way to decrease firm risk (Amihud and Lev (1981), May (1995)). To the extent that firms can increase the level of diversification by increasing the number of operating segments and decreasing the concentration of sales across the segments, I expect managers with large inside debt positions are more likely to set up more operating segments and lower concentration of sales across the segments.

Taken together, the main hypothesis of my study is that higher managerial ownership of debt implements lower corporate risk-taking, in terms of more investment in CAPEX, less

investment in R&D expenditures, and increased firm diversification. Moreover, shareholders can only gain at the expense of debtholders, e.g., by pursuing risky projects, when the default risk is non-trivial. I thus expect the role of inside debt in moderating risk-taking activities is more pronounced for firms with higher default risk.

3. Data and variables

3.1. Sample construction

I begin the sample construction process with Standard & Poor's (S&P) ExecuComp database, which provides managers' inside debt values as well as equity holdings in stocks and stock options. Inside debt compensation for executives mainly consists of two parts: deferred compensation and pension benefits. Securities and Exchange Commission's (SEC) adopted enhanced executive compensation disclosure requirements that came into effect in December 2006. The new regulations mandate that firms provide detailed information on the computation and value of executive pension benefits and deferred compensation. As a result, my sample firms must have fiscal year ends after December 2006. Due to data availability constraints, I only include firms with fiscal year end date on or before 12/31/2009. I also obtain relevant information on Vega, Delta, CEO tenure, CEO cash compensation from ExecuComp database.

The data of risk-taking measures, i.e., CAPEX, R&D, and corporate segments, is obtained from Compustat. I further require the observations to have sufficient financial data on Compustat and stock returns data on CRSP, such as total assets, market-to-book ratio, growth, industry information, annual stock return, and stock return volatility and so on. Financial firms are excluded from the sample since these firms have different characteristics in corporate risk-taking. Finally, I obtain 2,350 firm-year observations over the period 2007-2009, with 739 observations in 2007, 889 observations in 2008, and 722 observations in 2009.

3.2. Variable definitions

3.2.1. CEO inside debt and relative leverage measure

Jensen and Meckling (1976) show managers' incentives to transfer wealth between debtholders and shareholders are determined by their relative ownership position in debt and equity. More specifically, when managers hold an equal percentage of both claims, they have no incentive to transfer wealth from debtholders to shareholders. For example, if a CEO holds 10% of her company's equity and 10% of her company's debt, then each dollar of wealth transfer from debtholders to shareholders will result in 10 cents increase in the value of her equity ownership and 10 cents decline in the value of her debt ownership, leaving her overall wealth unchanged. More formally, if we use D_i and E_i to denote the market values of the CEO's debt and equity ownership and D_f and E_f to denote the market values of her firm's total debt and equity, the CEO will have no incentive to engage in wealth transfer if $\frac{D_i}{D_f} = \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} = \frac{D_f}{E_f}$.

On the other hand, if $\frac{D_i}{D_f} < \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} < \frac{D_f}{E_f}$, the CEO will be tempted to engage in debtholder expropriation on behalf of shareholders, creating the classical conflicts of interest between debtholders and shareholders. When $\frac{D_i}{D_f} > \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} > \frac{D_f}{E_f}$, the CEO's incentives will become more aligned with debtholders and lead her to take actions to transfer wealth from shareholders to debtholders.

To capture the above dynamics in CEO incentives from her debt and equity holdings, I construct a relative leverage measure that is equal to her personal leverage or debt-equity ratio (D_i/E_i) divided by her company's leverage or debt-equity ratio (D_f/E_f). The CEO's debt-equity ratio is equal to the value of her inside debt position divided by the value of her equity holdings, where the former equals the CEO's deferred compensation plus the present value of her pension benefits as reported by the company, and the latter equals to the market value of her stock

(including restricted stock and synthetic or performance shares) and stock option ownership. I compute the market value of stock ownership by multiplying the number of shares held by the fiscal year-end stock price, and compute the market value of stock options by applying the Black-Scholes (1973) formula to each individual tranche of options held by the CEO and then adding up the tranche values.[8] Firm debt-equity ratio is calculated as debt (DLTT + DLC) divided by the market value of equity (PRCC_F * CSHO).[9]

The relative leverage is an inverse measure of CEO incentives to engage in asset substitution to expropriate debtholders. CEOs with a relative leverage less than one tend to transfer wealth from debtholders to shareholders, and the reverse is true for CEOs with a relative leverage above one. CEOs with a relative leverage equal to one are indifferent to wealth transfer between debtholders and shareholders in either direction. Since CEO relative leverage has a highly skewed distribution due to its propensity to have outliers, I take its logarithmic transformation to reduce the right-skewness in the original data. As an alternative, I construct a dummy variable, *high relative leverage*, that is equal to one if CEO relative leverage is above one or zero otherwise. This binary variable is robust to the influence of outliers, and it can also capture any nonlinearity in the relation between CEO relative leverage and corporate risk taking.

3.2.2. Risk-taking measures

Following prior studies (e.g., Coles et al. (2006)), the risk-taking measures of interest in this study are: CAPEX, defined as net capital expenditures scaled by total assets, where net

[8] In applying the Black-Scholes formula to value executive stock options, I set the time-to-maturity of each tranche of options to either its full value or 70% of that to account for the early-exercising tendency of executives. The main results are not sensitive to this variation. Results presented in the paper are based on the full time to maturity of options.

[9] Following Wei and Yermack (2011), I also use an alternative construct of CEO relative leverage that is equal to $\frac{D_i / D_f}{\Delta E_i / \Delta E_f}$, where the denominator is the dollar change in the value of a CEO's stock and option portfolio per $1 increase in firm equity value. The correlation between the current measure and this alternative measure is 0.855. All the results hold with this alternative measure.

capital expenditures equal total capital expenditures minus sales of property, plant, and equipment; R&D, defined as research and development expenditures scaled by total assets;[10] Segs, the number of segments, defined as the number of operating segments a firm owns; Herf, Herfindahl index, defined as sum of square of segment sales divided by the square of firm sales.

3.2.3. Control variables

I select control variables that are shown in the existing literature to be determinants of corporate risk taking. Specifically, prior studies show CEO incentives generated from equity-based compensation, i.e., Vega and Delta, are significantly related to corporate risk-taking, I thus control for logarithm of Vega and Delta throughout all regressions. Vega is defined as dollar change in the value of the CEO's option portfolio for a 1% change in the annualized standard deviation of stock returns, while Delta is defined as change in the value of the CEO's option and stock portfolio for a 1% increase in the value of the firm's common stock price. I expect Vega is positively related to corporate risk-taking, as in prior studies (e.g., Guay (1999), Coles et al. (2006)). The prediction on Delta is unclear. On the one hand, higher Delta means the interests of managers are aligned with those of shareholders; thereby managers are expected to pursue risky projects. One the other hand, higher Delta means managers' wealth is undiversified and managers are expected not to take on risky projects. I also control for two other CEO characteristics, tenure and cash compensation, in all the regressions. To the extent that CEOs with longer tenure and higher cash compensation are more likely to be entrenched and thus less likely to take on risky projects (Berger et al. (1997)), I expect these two variables are negatively related with risk-taking.

Following prior studies on corporate risk taking, I further control for firm size, market-to-book ratio, growth, annual stock returns, book leverage, and surplus cash in all regressions. The detailed definitions of these variables are in the Appendix. Finally, I control for industry

[10] Following Coles et al. (2006), the values of observations with missing R&D are set to 0. I obtain similar results if I delete the firms with missing R&D from the sample.

fixed effects based on the SIC two digits industry classification.

3.3. Summary statistics

Table 1 presents summary statistics for my sample. All continuous variables are winsorized at the 1st and 99th percentiles to reduce the influence of outliers. CEO relative leverage has a mean of 0.934 and a median of 0.285. This variable is highly skewed since the mean of CEO relative leverage is almost equal to third quartile of its distribution. I use the logarithm transformation of this variable in the empirical analysis. The mean (median) of Log(1+CEO relative leverage) is 0.470 (0.251). Moreover, for about 28% of the sample observations, CEO relative leverage is above one, which is comparable to the statistics reported by Wei and Yermack (2010).

The average (median) firm in the sample has a CAPEX of 0.056 (0.037), a R&D of 0.024 (0.000), a Segs of 2.984 (3.000), a Herf of 0.718 (0.794), a total assets of $8.621 (2.676) billion, and a market-to-book ratio of 1.735 (1.479). The CEO at the average (median) firm has a Vega of $ 154,397 (72,570) and a Delta of $631,121 (232,098).

4. Empirical results

4.1. The effect of CEO inside debt on corporate risk-taking

In this section I examine the impact of CEO's inside debt positions on corporate risk-taking activities using OLS regressions. My hypothesis is that higher managerial ownership of debt implements lower corporate risk-taking, in terms of more investment in CAPEX, less investment in R&D expenditures, and increased firm diversification. The baseline regression model is specified as follows:

Risk-taking = f(CEO relative leverage, CEO characteristics,
Firm characteristics, and industry and year fixed effects),

where the dependent variable is the risk-taking measures and the key explanatory variable is the CEO's relative leverage.

The results of investment policy and CEO inside debt are presented in Table 2. Figures in the parentheses below coefficient estimates are *t*-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm-level clustering (Peterson (2009)). In the first two columns dependent variables are CAPEX, while the last two columns dependent variables are R&D. In column (1) and column (3) CEO relative leverage, Vega, and Delta are included in the regressions, since these three variables are related to managerial incentives. The coefficient on CEO relative leverage is 0.004 (t=2.60) in column (1), suggesting managerial ownership of debt implements more CAPEX investment. In column (3) the coefficient on CEO relative leverage is -0.007 (t=3.19), suggesting managers with higher debt holding are less likely to take R&D investment. Consistent with Coles et al. (2006), Vega has a negative and significant coefficient in column (1) and a positive and significant coefficient in column (3), suggesting Vega implements riskier investment policy choices. Moreover, in column (2) and (4) after controlling for more CEO specific characteristics, i.e., tenure, and cash compensation, as well as firm specific characteristics, i.e., size, market-to-book, growth, annual stock returns, book leverage and surplus cash, CEO relative leverage still has a positive and significant correlation with CAPEX and a negative and significant correlation with R&D investment. To gauge the economic significance, one standard deviation increase of Log(1+CEO relative leverage) increases CAPEX by 4% and decreases R&D by 16%. Overall, the results in table 2 support my hypothesis that managerial ownership of debt reduces corporate risk-taking activities in terms of corporate investment policies.

The results of firm focus and CEO inside debt are shown in Table 3. The first two columns show the results of number of Segments while the last two columns show the results of Herfindahl index for sales across segments. And in column (2) and column (4), CEO specific characteristics, i.e., tenure, and cash compensation, as well as firm specific characteristics are

controlled for in the regressions. As shown in the table, the coefficient on CEO relative leverage is 0.307 (t=2.57) in column (2), suggesting managers with higher debt holdings tend to build up more segments. In column (4) the coefficient on CEO relative leverage is -0.040 (t=2.53), suggesting managers with higher debt holding are less likely to have business concentration across segments. As shown in the table Vega becomes insignificant after including CEO relative leverage in the regressions. With respect to economic significance, one standard deviation increase in Log(1+CEO relative leverage) implies a 8.7% increase in the number of segments and an 4.1% decrease in the Herfindahl index. Overall, the results in table 3 also provide supportive evidence to my hypothesis that managerial ownership of debt implements less corporate risk-taking in terms of less corporate focus.

4.2. Default risk and the effect of CEO inside debt on corporate risk-taking

In this section, I explore whether the negative effect of CEO relative leverage on corporate risk-taking is more pronounced for firms that face higher expected default risk, to the extent that inside debt plays a more important role at these firms in reducing managers' incentives to engage in asset substitution activities. I use expected default frequency (Bharath and Shumway (2008)) as a proxy for firms' default risk. For ease of explanation, expected default frequency is transferred into an indicator variable, EDF, which equals 1 if expected default frequency at the beginning of the year is in the largest quintile, and 0 otherwise.

To test my hypothesis, I include the interaction term of CEO relative leverage and EDF as additional an explanatory variable in the risk-taking regression. The empirical results are presented in table 4. Corporate investment policies results are shown in column (1) and (2). For CAPEX, the interaction between CEO relative leverage and EDF has a significantly positive coefficient (0.007, t=2.06). For R&D, we can find the interaction between CEO relative leverage and EDF has a significantly negative coefficient (-0.007, t=1.77). These results are consistent with my expectation and suggest that the effect of CEO inside debt on corporate investment

policies is more pronounced for firms facing higher default risk.

Corporate focus results are shown in column (3) and (4). For number of segments, we can find the interaction between CEO relative leverage and EDF has an insignificant coefficient (-0.293, t=1.12). For Herfindahl index for sales across segments, the interaction between CEO relative leverage and EDF has an insignificant coefficient (0.019, t=1.52). Therefore, these results suggest that the relation between CEO relative leverage and corporate focus does not vary with firm default risk. One possible explanation for the insignificant results is that corporate focus policies are quite stable over time and costly to change in a short time.

4.3. Endogeneity of CEO inside debt

So far, I provide empirical evidence that higher managerial ownership of debt implements lower corporate risk-taking. However, it's possible that the level of CEO relative leverage is partially determined by corporate risk-taking policies. Coles, Daniel, and Naveen (2006) argue that causation between CEO incentives and corporate risk-taking policies is likely to run in both directions. It's also possible that corporate risk-taking and CEO inside debt are jointly determined by omitted variables. For example, potential shareholder-debtholder agency conflicts can influence both CEO inside debt positions and corporate risk-taking simultaneously.

I believe these alternative explanations cannot account for my findings. First, I have included a number of variables commonly used in the literature in each regression. Second, the endogeneity-driven interpretation is unable to explain the cross-sectional variations in the CEO relative leverage-corporate risk-taking relation along expected default risk. Nevertheless, to further address the endogeneity problem, I conduct two additional tests. As the first remedy, I employ a standard two-stage least squares (2SLS) approach by using two instrument variables. As the second try, I adopt the simultaneous equations models (3SLS) to further isolation the effect of CEO relative leverage on corporate risk-taking policies.

For the standard two-stage least squares (2SLS) approach, I instrument CEO relative

leverage by personal income tax rate and Gibbs estimate of trading costs. Personal income tax rate is the top personal income tax rate in the state where a firm is headquartered. Gibbs, which is an estimate of the effective trading costs of a firm's equity developed by Hasbrouck (2009).[11] I expect personal income tax rate to be positively related to CEO inside debt, as higher tax rates may induce CEOs to defer more of their current compensation. The equity trading cost measure, i.e., Gibbs, is likely to be negatively related to CEO relative leverage, if higher transaction costs discourage CEOs from dispensing the shares they receive either as direct compensation or as a result of exercising options. However, neither personal income tax rate nor a firm's equity trading costs suggests a direct and theoretically sensible linkage with corporate risk-taking activities.

The results of first stage are shown in column (1) of table 5. In the first stage I control for all the variables included in the second stage. We can find that the Gibbs estimate of equity trading costs has a significant and negative coefficient (-0.046, t=5.54) while personal income tax rate has a significant and positive coefficient (0.980, t=2.15), both consistent with conjectures. The adjusted partial R-squared attributed to the two instruments is 4.39%, which is statistically significant with a *p*-value less than 0.0001. These results suggest that the instruments satisfy the relevance condition.

The second stage results are presented in table 5. For R&D in column (2), we can find the coefficient on estimated CEO relative leverage from the first stage continues to be negative and significant (-0.025, t=2.59). In column (3), the instrumented CEO relative leverage continues to have a positive and significant coefficient for number of segments (0.983, t=2.05). And in column (4), the instrumented CEO relative leverage continues to have a negative and significant coefficient for Herfindahl index for sales across segments (-0.138, t=1.98). Although for CAPEX in column (1), the coefficient on instrumented CEO relative leverage is insignificant, it still has an expected sign. Taken together, the results in table 5 indicate that the negative relation between

[11] I thank Joel Hasbrouck for generously sharing his Gibbs estimates of trading costs on his website (http://pages.stern.nyu.edu/~jhasbrou/Research/GibbsCurrent/gibbsCurrentIndex.html).

CEO relative leverage and corporate risk-taking is unlikely to be driven by omitted variables.

As the second approach, following Coles, Daniel, and Naveen (2006), I further try to isolate the effect of CEO relative leverage on corporate risk-taking policies by employing simultaneous equations models (3SLS) approach. To the extent that CEO relative leverage and corporate policies are jointly determined, parameter estimates from ordinary least squares might be biased. To implement the simultaneous equations approach, the independent variables for corporate risk-taking policies are the same as those in prior analysis and the independent variables for CEO relative leverage are drawn from prior literature (e.g., Sundaram and Yermack (2007)).

Table 6 presents results of four systems specifications. In each system, the jointly determined variables are each corporate risk-taking policy (i.e., CAPEX, R&D, number of segments, Herfindahl index, respectively) and CEO relative leverage. Table 6 shows the results of each corporate risk-taking policy. For corporate investment policies, CEO relative leverage has a positive and significant coefficient for CAPEX (0.013, t=2.36) in column (1), a negative and significant coefficient for R&D (-0.098, t=11.58) in column (2). For corporate focus, CEO relative leverage has a positive and significant coefficient for number of segments (1.941, t=5.76) in column (3), a negative and significant coefficient for Herfindahl index of sales across segments (-0.201, t=4.41) in column (4). These results suggest the effect of CEO relative leverage on corporate risk-taking policies continues to hold after controlling for the endogenous feedback effects of policy choices on CEO incentives.

As robustness check, I use contemporaneous rather than lagged value of CEO relative leverage to conform to the underlying reasoning of simultaneous equations. I also try simultaneous equations models in which corporate policy, CEO relative leverage, as well as Vega and Delta are jointly determined simultaneously. Results are similar in these alternative specifications.

Collectively, the results in this section suggest that the negative effect of CEO relative leverage on corporate risk-taking is robust to correcting for the endogeneity concerns.

4.4. Alternative measure of CEO inside debt

To mitigate the measurement error of CEO relative leverage, I use an indicator measure of CEO relative leverage, High relative leverage, to capture the inside debt positions of CEOs. This binary variable is robust to the influence of outliers, and it can also capture any nonlinearity in the relation between CEO relative leverage and corporate risk taking. Empirically, I replace CEO relative leverage with High relative leverage and rerun the main regressions.

The results are shown in table 7. For corporate investment policies, High relative leverage has a positive and significant coefficient for CAPEX (0.003, t=1.83) in column (1), a negative and significant coefficient for R&D (-0.006, t=3.23) in column (2). For corporate focus, High relative leverage has a positive and significant coefficient for number of segments (0.282, t=2.08) in column (3), a negative and significant coefficient for Herfindahl index of sales across segments (-0.047, t=2.56) in column (4). Together, the results of High relative leverage are similar to those of CEO relative leverage, suggesting the main findings are robust to different measures of CEO inside debt positions.

4.5. Pension vs. deferred compensation

My analysis so far has treated executive pensions and deferred compensation as equivalent in computing CEO relative leverage. However, the two forms of compensation differ in at least two aspects that could impact the incentives they provide to managers. First, in contrast to pensions, which will pay benefits only when CEOs reach a mandatory age, deferred compensation can be withdrawn early, though usually with a hefty penalty (Wei and Yermack (2011)). By providing managers with an opportunity to cash out prior to performance deterioration and default events, the early withdrawal provision potentially weakens the risk-reducing incentives from deferred compensation in comparison to pensions. Second, firms sometimes allow executives' deferred compensation to be invested in their own equity (Wei and

Yermack (2011)), which to some extent negates the debt-like nature of deferred compensation and again weakens the risk-reducing incentives it provides.

In light of these differences, I construct two CEO relative leverage measures, one based on pension value only and the other based on deferred compensation only. I include these newly constructed CEO relative leverage measures jointly in the regressions, and present the results in Table 8. I find that the pension-based CEO relative leverage has a significantly negative effect on corporate risk taking, and the effect on the deferred compensation-based CEO relative leverage is negative but insignificant. These results suggest that consistent with our expectations, executive pensions indeed are more effective than deferred compensation in reducing managers' incentive to engage in excessive corporate risk taking.

4.6. CEO inside debt and firm risk

To the extent firm investment and focus policies capture different respects of risk-taking activities of a firm, stock return volatility captures overall risk-taking of the firm. If risk-taking policies influence stock volatility and managers with more inside debt holdings are more likely to pursue conservative projects, CEO relative leverage should ultimately affect stock volatility. I measure stock return volatility as standard deviation of monthly stock returns over the fiscal year and investigate the relation between stock volatility and CEO relative leverage.

I present the empirical results in table 9. In column (2) of table 9 we can find CEO relative leverage has a negative and significant coefficient (-0.017, t=7.12), suggesting higher CEO relative leverage implies lower firm risk. Overall, the empirical evidence in table 10 suggests that CEO relative leverage implements lower firm risk.

4.7. Other robustness checks

As robust test I further check whether my findings continue to hold in the subsample with nonzero CEO inside debt. In 625 of the 2,350 observations in the full sample, CEOs have zero

inside debt according to the information provided by *ExecuComp*. I search these firms' proxy statements and find that either they claim not to provide any pension or deferred compensation to their managers or they do not mention pension or deferred compensation at all. Since it is difficult to ascertain whether CEOs actually have inside debt for companies that fall into the second category, I delete observations with zero inside debt and re-estimate the regressions in a subsample of 1,725 observations where CEO inside debt balance is positive. Untabulated results show the main findings remain, suggesting that the main empirical evidence is not driven by any potential data problem with *ExecuComp*.

5. Conclusion

Debt holding by managers, i.e., inside debt, aligns the incentives of managers more closely with those of debtholders, reducing agency costs of debt (Jensen and Meckling (1976) and Edmans and Liu (2010)). I empirically examine the effect of managerial ownership of debt on classic agency costs of debt problems related to risk-shifting. I find that higher managerial ownership of debt implements more conservative policies, in terms of less investment in R&D, more investment in CAPEX, and more corporate diversification. These results still hold after addressing endogeneity problem and controlling for feedback effect of corporate risk-taking policies on CEO incentives. These findings suggest managers with large inside debt positions are less likely to engage in asset substitution activities that potentially transfer wealth from debtholders to shareholders. Overall, this study provides supportive empirical evidence to the existing theoretical work (Jensen and Meckling (1976) and Edmans and Liu (2010)).

A.1 Tables for chapter one

Appendix: Variable Definitions

Variable	Definitions
CEO inside debt	Sum of CEO deferred compensation and pension value
CEO inside equity	Market value of CEO stock and stock option holdings
CEO personal leverage	The ratio of CEO inside debt to inside equity
CEO relative leverage	CEO personal leverage divided by firm leverage, where firm leverage is equal to the book value of long-term and short-term debt (Compustat variable DLTT + DLC) divided by the market value of equity (PRCC_F*CSHO)
High relative leverage	A dummy variable equal to one if CEO relative leverage is greater than one
log(vega)	Dollar change in the value of the CEO's option portfolio for a 1% change in the annualized standard deviation of stock returns, in logs
log(delta)	Change in the value of the CEO's option and stock portfolio for a 1% increase in the value of the firm's common stock price, in logs.
CAPEX	Net capital expenditures (CAPX-SPPE) scaled by total assets (AT).
R&D	Research and development expenditures (XRD) scaled by assets (AT).
Segs	Number of operating segments as reported in Compustat segment database.
Herf	Sum of squared segment sales divided by squared firm sales.
Tenure	CEO's tenure measured in years.
Cashcomp	CEO's cash based compensation, the sum of salary and bonus.
Size	Book value of total assets (AT), in logs.
MB	Market value of the firm (PRCC_F*CSHO +AT-CEQ) divided by book value of total assets (AT).
Growth	Growth of sales, measured as log(SALEt/SALEt-1).
Cret	Annual stock returns over the fiscal year.
Levb	Total debt (DLTT+DLC) divided by the book value of assets (AT).
Surcash	Surplus cash, calculated as cash from assets-in-place (OANCF-DPC+XRD) scaled by total asset (AT).
Firm risk	Stock return volatility, standard deviation of monthly stock returns over the fiscal year.
EDF	Expected default frequency, based on Merton model of Bharath and Shumway (2008).

Table 1. Summary Statistics

The sample consists of 2,350 firm-year observations. Variable definitions are in the Appendix.

Panel A: Descriptive statistics								
	N	Mean	Stdev	P10	Q1	Median	Q3	P90
Inside debt, D_i (mil $)	2350	5.778	12.056	0.000	0.000	1.413	6.359	14.963
Inside equity, E_i (mil $)	2350	93.475	836.578	2.655	6.267	16.530	42.833	106.953
CEO personal leverage, D_i/E_i	2350	0.337	1.304	0.000	0.000	0.075	0.339	0.771
CEO relative leverage	2350	0.934	1.506	0.000	0.000	0.285	1.152	2.811
Log(1+ CEO relative leverage)	2350	0.470	0.557	0.000	0.000	0.251	0.766	1.338
High relative leverage (=1 if CEO relative leverage>1)	2350	0.280	0.449	0.000	0.000	0.000	1.000	1.000
Vega (thousand $)	2350	154.397	224.535	7.516	24.995	72.570	184.404	401.274
Delta (thousand $)	2350	631.121	1254.660	33.812	85.123	232.098	606.971	1446.764
Tenure	2350	6.293	6.243	0.000	2.000	4.000	9.000	15.000
Cashcomp (mil $)	2350	1.031	0.799	0.461	0.625	0.862	1.110	1.577
CAPEX	2350	0.056	0.060	0.010	0.018	0.037	0.071	0.121
R&D	2350	0.024	0.043	0.000	0.000	0.000	0.027	0.082
Segs	2350	2.984	2.122	1.000	1.000	3.000	4.000	6.000
Herf	2350	0.718	0.290	0.303	0.446	0.794	1.000	1.000
Firm risk	2350	0.130	0.077	0.055	0.076	0.111	0.161	0.224
Assets (bil $)	2350	8.621	17.157	0.446	0.973	2.676	7.627	23.796
Size	2350	7.961	1.482	6.100	6.881	7.892	8.939	10.077
MB	2350	1.735	0.841	1.000	1.176	1.479	2.037	2.786
Growth	2350	0.089	0.162	-0.067	0.018	0.083	0.156	0.276
Cret	2350	-0.017	0.388	-0.511	-0.288	-0.024	0.213	0.457
Levb	2350	0.274	0.166	0.071	0.155	0.257	0.368	0.479
Surcash	2350	0.082	0.079	-0.001	0.035	0.074	0.118	0.182
Edf	2350	0.053	0.170	0.000	0.000	0.000	0.001	0.134

Panel B. Pearson (top) and Spearman (bottom) correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Log(1+ CEO relative leverage)		0.862	0.100	-0.003	0.011	-0.050	0.181	-0.160	-0.092	0.101	0.235	0.043	-0.060	0.037	-0.184	0.064	-0.190
2	High relative leverage	0.785		0.090	-0.004	-0.002	-0.028	0.144	-0.143	-0.068	0.098	0.177	0.052	-0.048	0.035	-0.169	0.051	-0.160
3	Log(vega)	0.166	0.097		0.611	-0.083	0.109	0.051	-0.046	0.047	0.310	0.495	0.190	0.037	0.048	-0.051	0.218	-0.317
4	Log(delta)	0.077	0.006	0.672		0.162	-0.028	0.045	-0.039	0.343	0.350	0.497	0.342	0.175	0.330	-0.083	0.240	-0.379
5	CAPEX	0.124	0.073	-0.021	0.175		-0.182	-0.032	0.065	0.093	0.047	0.079	0.080	0.193	0.157	-0.013	0.056	-0.078
6	R&D	0.002	0.089	0.153	-0.005	-0.255		-0.045	0.009	-0.013	-0.102	-0.200	0.331	0.042	-0.013	-0.094	0.472	0.043
7	Segs	0.201	0.140	0.019	0.027	-0.014	0.080		-0.884	-0.015	0.135	0.202	-0.111	-0.011	0.081	-0.061	-0.057	-0.123
8	Herf	-0.182	-0.139	-0.030	-0.033	0.053	-0.137	-0.940		0.043	-0.107	-0.140	0.093	-0.011	-0.074	0.085	0.011	0.091
9	Tenure	-0.013	-0.013	0.121	0.376	0.065	-0.039	0.003	0.016		0.073	-0.042	0.001	0.092	0.006	0.038	0.032	0.004
10	Cashcomp	0.291	0.185	0.485	0.469	0.083	-0.085	0.120	-0.115	0.138		0.479	-0.038	-0.006	0.024	0.046	-0.019	-0.118
11	Size	0.343	0.173	0.541	0.495	0.158	-0.140	0.171	-0.140	-0.013	0.647		-0.133	-0.028	0.009	0.112	-0.043	-0.273
12	MB	0.044	0.096	0.244	0.413	0.163	0.274	-0.069	0.045	0.021	-0.007	-0.089		0.222	0.395	-0.074	0.501	-0.220
13	Growth	-0.078	-0.044	0.019	0.204	0.179	0.087	-0.012	0.001	0.162	-0.027	-0.034	0.249		0.206	-0.086	0.117	-0.137
14	Cret	0.089	0.054	0.057	0.347	0.199	0.003	0.091	-0.084	0.031	0.032	0.036	0.491	0.207		-0.146	0.099	-0.362
15	Levb	-0.085	-0.163	-0.030	-0.067	0.019	-0.195	-0.039	0.065	0.044	0.094	0.160	-0.191	-0.108	-0.129		-0.239	0.142
16	Surcash	0.015	0.064	0.249	0.263	0.021	0.408	-0.062	0.013	0.043	-0.006	-0.051	0.535	0.174	0.113	-0.298		-0.180
17	Firm risk	-0.265	-0.183	-0.300	-0.341	-0.142	0.037	-0.125	0.099	0.012	-0.188	-0.324	-0.280	-0.068	-0.370	0.057	-0.134	

Table 2. The effect of CEO inside debt on corporate investment

This table presents the regression results of the effect of CEO inside debt on corporate investment policies. The dependent variables are CAPEX in the first two columns and R&D in the last two columns. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) CAPEX	(2) CAPEX	(3) R&D	(4) R&D
Log(1+CEO relative leverage$_{t-1}$)	0.004***	0.004**	-0.007***	-0.008***
	(2.60)	(2.33)	(-3.19)	(-3.87)
Log(vega)$_{t-1}$	-0.004***	-0.003***	0.003***	0.003***
	(-5.00)	(-3.54)	(3.84)	(3.78)
Log(delta)$_{t-1}$	0.005***	0.004***	-0.002**	-0.005***
	(5.85)	(3.47)	(-2.12)	(-3.95)
Tenure$_{t-1}$		-0.000		0.000**
		(-0.57)		(2.28)
Cashcomp$_{t-1}$		-0.000		0.000
		(-0.96)		(0.27)
Size$_{t-1}$		-0.002		-0.002*
		(-1.45)		(-1.87)
MB$_{t-1}$		0.005***		0.009***
		(2.82)		(2.77)
Growth$_{t-1}$		0.021***		-0.007
		(3.70)		(-1.07)
Cret$_{t-1}$		0.003		-0.011***
		(1.16)		(-3.96)
Levb$_{t-1}$		-0.010		0.005
		(-1.55)		(0.42)
Surcash$_{t-1}$		0.023		0.165***
		(1.60)		(6.51)
Constant	0.029**	0.030***	0.062**	0.059***
	(2.29)	(3.09)	(2.28)	(3.09)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.46	0.49	0.34	0.48

Table 3. The effect of CEO inside debt on corporate focus

This table presents the regression results of the effect of CEO inside debt on corporate focus policies. The dependent variables are Number of segments in fist two columns and Herfindahl index for sales across segments in last two columns. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) Segs	(2) Segs	(3) Herf	(4) Herf
Log(1+CEO relative leverage$_{t-1}$)	0.466***	0.307**	-0.053***	-0.040**
	(3.75)	(2.57)	(-3.41)	(-2.53)
Log(vega)$_{t-1}$	0.020	-0.044	-0.001	0.007
	(0.49)	(-1.04)	(-0.09)	(1.05)
Log(delta)$_{t-1}$	0.077	-0.005	-0.013*	-0.014
	(1.53)	(-0.08)	(-1.71)	(-1.42)
Tenure$_{t-1}$		0.008		0.002
		(0.78)		(1.13)
Cashcomp$_{t-1}$		0.000*		-0.000
		(1.75)		(-1.64)
Size$_{t-1}$		0.242***		-0.018**
		(3.74)		(-2.04)
MB$_{t-1}$		-0.320***		0.057***
		(-4.12)		(5.23)
Growth$_{t-1}$		0.141		-0.032
		(0.52)		(-0.81)
Cret$_{t-1}$		0.321**		-0.050***
		(2.45)		(-2.62)
Levb$_{t-1}$		-1.259***		0.129**
		(-3.40)		(2.34)
Surcash$_{t-1}$		-0.685		0.007
		(-0.90)		(0.06)
Constant	1.970**	1.505*	0.565***	0.555***
	(2.23)	(1.90)	(6.17)	(6.23)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.15	0.19	0.13	0.17

Table 4. The effect of default risk on CEO inside debt-corporate risk-taking relation

This table presents the regression results of the effect of default risk on CEO inside debt-corporate risk-taking relation. The dependent variables are CAPEX, R&D, Number of Segments, Herfindahl index, market leverage, and book leverage, respectively. EDF equals 1 if expected default frequency at the beginning of the year is in the largest quintile, 0 otherwise. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) CAPEX	(2) R&D	(3) Segs	(4) Herf
Log(1+CEO relative leverage$_{t-1}$)	0.003	-0.006***	0.320***	-0.039**
	(1.47)	(-2.97)	(2.58)	(-2.41)
Log(1+CEO relative leverage)$_{t-1}$*EDF	0.007**	-0.007*	-0.293	0.019
	(2.06)	(-1.77)	(-1.12)	(0.52)
EDF	-0.011***	0.013***	-0.169	0.035
	(-3.87)	(4.60)	(-1.05)	(1.54)
Log(vega)$_{t-1}$	-0.003***	0.003***	-0.051	0.008
	(-3.79)	(4.04)	(-1.21)	(1.21)
Log(delta)$_{t-1}$	0.004***	-0.004***	-0.018	-0.012
	(3.16)	(-3.62)	(-0.28)	(-1.22)
Tenure$_{t-1}$	-0.000	0.000**	0.009	0.002
	(-0.49)	(2.17)	(0.88)	(1.03)
Cashcomp$_{t-1}$	-0.000	0.000	0.000*	-0.000*
	(-0.84)	(0.03)	(1.82)	(-1.74)
Size$_{t-1}$	-0.001	-0.002**	0.246***	-0.019**
	(-1.38)	(-1.98)	(3.79)	(-2.10)
MB$_{t-1}$	0.005***	0.009***	-0.321***	0.058***
	(2.76)	(2.82)	(-4.12)	(5.24)
Growth$_{t-1}$	0.021***	-0.007	0.138	-0.032
	(3.76)	(-1.08)	(0.51)	(-0.80)
Cret$_{t-1}$	-0.001	-0.007**	0.224	-0.034*
	(-0.24)	(-2.44)	(1.61)	(-1.68)
Levb$_{t-1}$	-0.004	-0.004	-1.112***	0.102*
	(-0.56)	(-0.33)	(-2.81)	(1.78)
Surcash$_{t-1}$	0.020	0.169***	-0.838	0.028
	(1.39)	(6.65)	(-1.11)	(0.26)
Constant	0.037***	0.049***	1.661**	0.526***
	(3.75)	(2.60)	(2.10)	(5.87)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.49	0.49	0.19	0.17

Table 5. Two-stage least square (2SLS) regression of corporate risk-taking

This table presents the two-stage least square regression of corporate risk-taking, where CEO relative leverage is instrumented by (i) the Gibbs estimate of a firm's equity trading costs developed by Hasbrouck (2009) and (ii) the top personal income tax rate in the state where a firm is headquartered. The dependent variables are CAPEX, R&D, Number of Segments, Herfindahl index, market leverage, and book leverage, respectively. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) Log(1+CEO relative leverage)	(2) CAPEX	(3) R&D	(4) Segs	(5) Herf
Log(1+CEO relative leverage)$_{t-1}$		0.007	-0.025***	0.983**	-0.138**
		(1.10)	(-2.59)	(2.05)	(-1.98)
Gibbs	-0.046***				
	(-5.54)				
Taxrate	0.980**				
	(2.15)				
Log(vega)$_{t-1}$	0.009	-0.002***	0.003***	-0.056	0.009
	(0.72)	(-3.15)	(3.86)	(-1.26)	(1.18)
Log(delta)$_{t-1}$	-0.140***	0.004***	-0.007***	0.084	-0.022
	(-8.21)	(2.87)	(-4.11)	(0.88)	(-1.56)
Tenure$_{t-1}$	0.006**	-0.000	0.000***	0.004	0.002
	(2.51)	(-0.54)	(2.67)	(0.37)	(1.31)
Cashcomp$_{t-1}$	0.000	-0.000	0.000	0.000*	-0.000**
	(0.66)	(-1.32)	(0.36)	(1.66)	(-2.16)
Size$_{t-1}$	0.148***	-0.001	0.001	0.138	-0.002
	(9.06)	(-0.96)	(0.32)	(1.38)	(-0.13)
MB$_{t-1}$	0.140***	0.004**	0.011***	-0.410***	0.063***
	(5.90)	(2.25)	(3.33)	(-4.01)	(4.28)
Growth$_{t-1}$	-0.187***	0.017***	-0.010	0.278	-0.081*
	(-2.64)	(3.76)	(-1.53)	(0.95)	(-1.90)
Cret$_{t-1}$	0.041	0.001	-0.011***	0.289**	-0.044**
	(1.26)	(0.63)	(-3.67)	(2.15)	(-2.17)
Levb$_{t-1}$	-0.829***	-0.005	-0.009	-0.698	0.024
	(-8.86)	(-0.61)	(-0.65)	(-1.30)	(0.31)
Surcash$_{t-1}$	-0.161	0.014	0.164***	-0.661	-0.062
	(-0.71)	(1.14)	(6.54)	(-0.84)	(-0.57)
Constant	0.109	0.028***	0.057**	1.559*	0.702***
	(0.39)	(3.23)	(2.58)	(1.72)	(11.06)
Industry effect	Included	Included	Included	Included	Included
Year effect	Included	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350	2,350
Adj. R-squared	0.24	0.47	0.44	0.17	0.11

Table 6. Simultaneous equations (3SLS)

This table presents the results of each corporate policy (CAPEX, R&D, Number of Segments, Herfindahl index, respectively) in four systems specifications, where corporate policies and CEO relative leverage are simultaneous determined. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) CAPEX	(2) R&D	(3) Segs	(4) Herf
Log(1+CEO relative leverage)$_{t-1}$	0.013**	-0.098***	1.941***	-0.201***
	(2.36)	(-11.58)	(5.76)	(-4.41)
Log(vega)$_{t-1}$	-0.006***	0.008***	-0.043	0.003
	(-9.06)	(8.28)	(-1.16)	(0.69)
Log(delta)$_{t-1}$	0.006***	-0.020***	0.106	-0.019*
	(4.85)	(-11.91)	(1.49)	(-1.93)
Tenure$_{t-1}$	0.000	0.000***	0.001	0.002**
	(1.53)	(2.62)	(0.15)	(2.02)
Cashcomp$_{t-1}$	-0.000	-0.000	0.000***	-0.000***
	(-1.14)	(-0.01)	(2.63)	(-2.61)
Size$_{t-1}$	0.003**	0.012***	0.005	0.009
	(2.19)	(6.62)	(0.07)	(0.92)
MB$_{t-1}$	0.001	0.026***	-0.494***	0.073***
	(0.81)	(12.79)	(-5.91)	(6.46)
Growth$_{t-1}$	0.030***	-0.001	0.218	-0.060
	(6.42)	(-0.23)	(0.78)	(-1.54)
Cret$_{t-1}$	0.006**	0.002	0.584***	-0.072***
	(2.56)	(0.67)	(4.52)	(-4.02)
Levb$_{t-1}$	0.014**	-0.088***	0.489	-0.019
	(2.15)	(-8.78)	(1.23)	(-0.35)
Surcash$_{t-1}$	0.000	0.091***	0.222	-0.187**
	(0.01)	(7.59)	(0.34)	(-2.09)
Constant	0.006	0.023***	2.158***	0.735***
	(1.19)	(2.98)	(7.10)	(17.93)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.09	0.09	-0.03	0.01

Table 7. The effect of High relative leverage on corporate risk-taking

This table presents the regression results of the effect of CEO inside debt on corporate risk-taking. CEO inside debt is measured as High relative leverage. The dependent variables are CAPEX, R&D, Number of Segments, Herfindahl index, market leverage, and book leverage, respectively. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) CAPEX	(2) R&D	(3) Segs	(4) Herf
High relative leverage $_{t-1}$	0.003*	-0.006***	0.282**	-0.047**
	(1.83)	(-3.23)	(2.08)	(-2.56)
Log(vega) $_{t-1}$	-0.002***	0.003***	-0.044	0.007
	(-3.07)	(3.76)	(-1.04)	(1.09)
Log(delta) $_{t-1}$	0.003***	-0.004***	-0.019	-0.013
	(3.29)	(-3.68)	(-0.28)	(-1.35)
Tenure $_{t-1}$	-0.000	0.000**	0.008	0.002
	(-0.38)	(2.19)	(0.82)	(1.12)
Cashcomp $_{t-1}$	-0.000	0.000	0.000*	-0.000
	(-1.32)	(0.34)	(1.70)	(-1.59)
Size $_{t-1}$	-0.001	-0.003**	0.263***	-0.020**
	(-0.59)	(-2.47)	(4.03)	(-2.25)
MB $_{t-1}$	0.005***	0.009***	-0.308***	0.057***
	(3.22)	(2.66)	(-3.96)	(5.19)
Growth $_{t-1}$	0.016***	-0.006	0.116	-0.031
	(3.59)	(-0.96)	(0.43)	(-0.76)
Cret $_{t-1}$	0.001	-0.012***	0.327**	-0.051***
	(0.77)	(-4.01)	(2.48)	(-2.63)
Levb $_{t-1}$	-0.009	0.007	-1.343***	0.133**
	(-1.60)	(0.65)	(-3.64)	(2.44)
Surcash $_{t-1}$	0.014	0.164***	-0.663	0.003
	(1.15)	(6.46)	(-0.88)	(0.02)
Constant	0.027***	0.060***	1.441*	0.565***
	(2.95)	(3.19)	(1.81)	(6.25)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.47	0.48	0.19	0.17

Table 8. The effect of CEO pension and deferred compensation on corporate risk-taking

This table presents the regression results of the effect of CEO inside debt on firm risk. Firm risk is measured as monthly stock return volatility during the fiscal year. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) CAPEX	(2) R&D	(3) Segs	(4) Herf
Log(1+CEO pension)$_{t-1}$	0.005**	-0.008***	0.506***	-0.057***
	(2.09)	(-3.45)	(3.26)	(-2.93)
Log(1+CEO deferred compensation)$_{t-1}$	0.002	-0.004	0.018	-0.011
	(0.95)	(-1.58)	(0.11)	(-0.47)
Log(vega)$_{t-1}$	-0.003***	0.003***	-0.048	0.007
	(-3.55)	(3.81)	(-1.14)	(1.11)
Log(delta)$_{t-1}$	0.004***	-0.005***	0.001	-0.014
	(3.45)	(-3.92)	(0.01)	(-1.47)
Tenure$_{t-1}$	-0.000	0.000**	0.008	0.002
	(-0.55)	(2.24)	(0.79)	(1.11)
Cashcomp$_{t-1}$	-0.000	0.000	0.000*	-0.000
	(-0.97)	(0.28)	(1.70)	(-1.62)
Size$_{t-1}$	-0.001	-0.002**	0.240***	-0.018**
	(-1.42)	(-1.99)	(3.74)	(-2.03)
MB$_{t-1}$	0.005***	0.009***	-0.319***	0.057***
	(2.85)	(2.74)	(-4.11)	(5.23)
Growth$_{t-1}$	0.021***	-0.006	0.131	-0.031
	(3.68)	(-1.03)	(0.48)	(-0.78)
Cret$_{t-1}$	0.003	-0.011***	0.324**	-0.051***
	(1.17)	(-3.99)	(2.45)	(-2.62)
Levb$_{t-1}$	-0.011	0.006	-1.280***	0.131**
	(-1.60)	(0.50)	(-3.45)	(2.38)
Surcash$_{t-1}$	0.023*	0.164***	-0.550	-0.006
	(1.66)	(6.43)	(-0.72)	(-0.06)
Constant	0.030***	0.058***	1.572**	0.549***
	(3.11)	(3.10)	(2.02)	(6.23)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,350	2,350	2,350	2,350
Adj. R-squared	0.49	0.48	0.20	0.17

Table 9. The effect of CEO inside debt on firm risk

This table presents the regression results of the effect of CEO inside debt on firm risk. Firm risk is measured as monthly stock return volatility during the fiscal year. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) Firm risk	(3) Firm risk
Log(1+CEO relative leverage)$_{t-1}$	-0.022***	-0.017***
	(-9.26)	(-7.12)
Log(vega)$_{t-1}$	0.007***	0.007***
	(5.98)	(5.48)
Log(delta)$_{t-1}$	-0.012***	-0.008***
	(-9.66)	(-4.82)
Tenure$_{t-1}$		0.000*
		(1.70)
Cashcomp$_{t-1}$		-0.000
		(-1.48)
Size$_{t-1}$		-0.002
		(-1.57)
MB$_{t-1}$		0.003
		(1.36)
Growth$_{t-1}$		-0.022**
		(-2.13)
Cret$_{t-1}$		-0.024***
		(-5.57)
Levb$_{t-1}$		0.039***
		(4.29)
Surcash$_{t-1}$		-0.145***
		(-6.75)
Constant	0.165***	0.172***
	(15.15)	(7.42)
Industry effect	Included	Included
Year effect	Included	Included
Observations	2,350	2,350
Adj. R-squared	0.43	0.47

CHAPTER TWO MANAGERIAL OWNERSHIP OF DEBT AND BANK LOAN CONTRACTING

1. Introduction

In this chapter I examine how executive pensions and deferred compensation at borrowing firms affect the terms and structure of bank loans at origination. There are several reasons underlying my focus on bank loans rather than corporate bonds. First, bank loans are an important source of corporate financing. About 80% of the public companies in the U.S. maintain active bank loan facilities, while only 15% to 20% of them have public debt outstanding (Faulkender and Petersen (2006) and Sufi (2007)). Therefore, examining bank loans allows this study to provide evidence generalizable to a large cross section of firms.[12]

Second, it is unclear ex ante how banks respond to managerial debt ownership at borrowing firms. On the one hand, banks are in the business of lending and thus are likely to be more sophisticated at evaluating borrowing firms' credit risk than investors in corporate bonds, who are usually insurance companies, pension funds, and other institutional investors. Therefore, they may be more astute to the impact of inside debt on managerial incentives and debtholder wealth and reflect it more fully in designing loan contracts. On the other hand, as relationship lenders, banks develop more expertise and more efficient technologies in monitoring (Diamond (1984)). As a result, they may choose to rely more on monitoring than contracting to protect their interests, suggesting that terms of bank loans may be insensitive to inside debt at borrowing firms.

Finally, compared to public debt, bank loan contracts contain a richer set of information

[12] Recent studies focusing on bank loans include Graham, Li, and Qiu (2008), Lin, Ma, Malatesta, and Xuan (2010), Chava and Roberts (2008), Chava, Livdan, and Purnanandam (2009), Ivashina (2009), and Nini, Smith, and Sufi (2009)).

that enables us to evaluate the effects of inside debt on both their pricing (yield spreads) and non-pricing features (e.g., covenants, collateral, and syndication structure).[13]

My main hypothesis is that to the extent that inside debt reduces managerial incentives to expropriate debtholders, banks demand lower yield spreads and less stringent terms on loans to firms where CEOs hold larger inside debt positions in the form of pensions and deferred compensation. I also develop several auxiliary propositions regarding how firm and CEO characteristics affect the relation between inside debt and loan pricing. To test my conjectures, I construct a relative leverage measure for a firm's CEO to capture her incentives to engage in debtholder expropriation activities. The CEO's relative leverage is equal to her personal debt-equity (D/E) ratio relative to her firm's D/E ratio, where the value of her debt holding is equal to the sum of her deferred compensation and defined-benefits pension and the value of her equity holding is the market value of her stock and stock option ownership. Edmans and Liu (2011) show that the higher the CEO's relative leverage, the less incentive she has to expropriate debtholders. In fact, when the CEO's relative leverage is above one, she may even have incentives to transfer wealth from shareholders to debtholders (Jensen and Meckling (1976) and Edmans and Liu (2011)).

Empirical analysis yields evidence highly consistent with the hypotheses. Specifically, I find that banks charge lower spreads on loans made to firms where CEOs have a higher relative leverage, and the relation is statistically significant and robust to controlling for a wide array of determinants of loan spreads previously documented in the literature. The identified effect of inside debt on loan spreads is also economically significant. Ceteris paribus, loan yields are lower by about 10% or 22 basis points (bps) for a borrowing firm whose CEO's relative leverage is above one than for a borrowing firm whose CEO's relative leverage is below one.[14]

---

[13] Compared to public bonds, bank loans tend to include more covenants, which are also set tighter, monitored more closely, and enforced more frequently (Kahan and Tuckman (1995) and Sweeney (1994)). These patterns are consistent with the more concentrated ownership and active monitoring by bank lenders and the resultant lower renegotiating costs (Smith and Warner (1979), Diamond (1984, 1991), Rajan (1992), and Chava and Roberts (2008)).

[14] This magnitude is comparable to that reported by other studies of loan pricing, e.g., Bharath, Dahiya,

I next explore whether the effect of inside debt on loan yields varies with the expected agency costs of debt at borrowing firms. I expect inside debt to play a more important role to alleviate creditor concerns about asset substitution in the presence of higher expropriation risk (Edmans and Liu (2011)). Consistent with this conjecture, I find that the negative effect of CEO relative leverage on loan spreads is stronger when borrowing firms have lower credit rating, higher leverage, and more R&D investment, characteristics associated with more serious conflicts of interest between shareholders and creditors.

I also examine whether creditors take into account the expected retirement horizon of CEOs in relation to loan maturity when dissecting the implications of CEO inside debt positions for loan pricing. Compared to CEOs who are expected to step down soon, CEOs who are expected to remain in office during a loan's entire maturity likely have greater potential to impact the loan's performance and repayment through their choices of investment and financial policies. Therefore, I expect their relative leverage to factor more heavily into banks' loan pricing decisions. On the other hand, CEOs closer to retirement may be tempted to take excessive risk to increase short-term stock price even when such actions carry adverse long-term consequences for both shareholders and debtholders. Inside debt helps tie the fortune of these retiring CEOs more closely with the long-term performance and survival of their firms, thereby discouraging excessive risk taking and other opportunistic behavior prior to retirement. As a result, creditors may especially value the inside debt holdings by CEOs who are expected to retire soon. The evidence from empirical analysis is consistent with the first conjecture. Specifically, I find that the negative effect of CEO relative leverage on loan spreads is stronger when CEOs are not expected to retire until after loan maturity.

I further examine whether CEO relative leverage affects non-pricing features of bank loans such as covenant restrictions, collateral requirement, and syndicate structure. I find that loans made

---

Saunders, and Srinivasan (2009), Chava, Livdan, and Purnanandam (2009), Jiang, Li, and Shao (2010), and Lin, Ma, Malatesta, and Xuan (2010).

to firms with higher CEO relative leverage are associated with fewer covenant restrictions, less collateral requirement, and smaller lending syndicates. These findings are consistent with the notion that creditors worry less about being expropriated at these firms and therefore, they have less need for covenants, collateral assets, and larger syndicates to restrict asset substitution activities, help recoup losses in default events, and share credit risk, respectively.

Finally, before I conclude that CEO relative leverage affects bank loan contracting, I address the causality issue due to the potential endogeneity of CEO relative leverage. While my tests are not subject to simultaneity or reverse causality concerns since I measure CEO inside debt and equity positions prior to the origination of bank loans, they could still suffer from an "omitted variable" problem where some firm characteristic uncontrolled for in my regressions is correlated with both CEO relative leverage and loan spreads. This would lead to biased coefficient estimates from OLS regressions and a spurious relation between CEO relative leverage and loan pricing. From a conceptual standpoint, I find it unlikely that the omitted variable problem is driving my findings, since any omitted variable needs to be able to explain not only the negative relation between CEO relative leverage and loan spreads but also the relation's cross-sectional variation along the dimensions of firm and CEO characteristics uncovered by my findings.

Nevertheless, I directly deal with the endogeneity problem through two approaches. First, I exploit the first-time SEC-mandated disclosure of firms' executive pension and deferred compensation information and examine the difference in yield spread between loans originated immediately before and after the initial disclosure. This approach is analogous to an event study and by focusing on within-firm differences, it can filter out the influence of any unobservable time-invariant firm characteristics. I observe a significantly negative relation between the change in yield spread and the CEO relative leverage implied by a firm's disclosure of inside debt, and this relation is robust to controlling for changes in firm and loan characteristics and macroeconomic conditions.

As the second approach, I estimate a two-stage least square (2SLS) regression that

endogenizes CEO relative leverage. I select two instrument variables for CEO relative leverage. One is the top personal income tax rate for the state where a firm is headquartered, and the other is a measure of a firm's effective equity trading costs. I expect the state personal income tax rate to be positively related to CEO relative leverage, as higher tax rates may induce CEOs to defer more of their current compensation. The equity trading cost measure is likely to be negatively related to CEO relative leverage, if higher transaction costs discourage CEOs from dispensing the shares they receive either as direct compensation or as a result of exercising options. I find that the two instruments satisfy both the relevancy and exogeneity conditions, and that CEO relative leverage continues to have a significant and negative effect on loan spreads after correction for endogeneity.

Overall in this chapter I present evidence that bank creditors view inside debt at borrowing firms favorably and offer more attractive pricing and less restrictive terms on loans to firms whose CEOs have a higher relative leverage. This study adds to the body of research on the effects of executive compensation on debt contracting, which has largely focused on equity-based compensation including stock and stock options. My empirical analysis demonstrates that the inside debt held by CEOs pension benefits and deferred compensation plays an important role in firms' interaction with bank creditors by mitigating agency costs of debt and offsetting the effect of equity-based compensation. Moreover, I show how the effect of CEO inside debt on bank loan contracting varies with firm and managerial characteristics. In doing so, I shed light on the conditions under which CEO inside debt plays a more prominent role in alleviating shareholder-debtholder conflicts and agency costs of debt. As such, my research complements and extends the finding by Wei and Yermack (2011) that publicly traded corporate bonds on average experience positive abnormal returns upon firms' proxy statement disclosure of high CEO relative leverage.

The remainder of the chapter is organized as follows. Section 2 discusses sample construction and variable definitions. Section 3 presents my empirical results. Section 4 concludes.

2. Data and variables

2.1. Sample construction

In August 2006, the United States Securities and Exchange Commission (SEC) adopted enhanced executive compensation disclosure requirements that came into effect in December 2006. The new regulations mandate, among other things, that firms provide detailed information on the computation and value of executive pension benefits and deferred compensation. As a result, I require that borrowing firms have fiscal year ends in or after December 2006.

The data source for bank loans is the DealScan database, which provides data on loan facilities collected primarily from SEC filings, self-reporting by lenders, or information from major banks. It contains comprehensive information about loan pricing and various loan terms at origination, such as loan size, loan maturity, and purposes of loans. I match the loan data with Compustat data using the DealScan-Compustat link file (version: August 27, 2010) maintained by Michael Roberts and the Wharton Research Data Services (WRDS).[15] Since the link file is incomplete for year 2010, I have to manually match some of the loans in 2010. I exclude firms in the financial industries (SIC codes: 6000-6999) from my sample and require that firms have necessary financial statement information from Compustat, stock return data from CRSP, and executive compensation data from ExecuComp, all prior to loan origination. The main sample for my analysis consists of 1,280 loan facilities for 676 unique firms originated during the period from 2007 to 2010. There are 409 loans in 2007, 321 loans in 2008, 208 loans in 2009, and 342 loans in 2010.

2.2. Variable definitions

2.2.1. Bank loan terms and structure

The loan term of my primary focus is the all-in spread drawn (AISD), defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for the drawn portion

[15] We thank Michael Roberts for his generosity in sharing the link file. For more details on the file, please see Chava and Roberts (2008).

of each loan facility. AISD is an all-inclusive measure of loan pricing, which includes the interest rate spread over LIBOR on a loan and any annual fees. Following previous studies such as Graham, Li, and Qiu (2008), Chava, Livdan, and Purnanandam (2009), and Lin, Ma, Malatesta, and Xuan (2010), I take the logarithmic transformation of the spread to reduce the skewness in the original data. I also examine the nonprice terms and structure of bank loans such as the extent of covenant restrictions, the collateral requirement, and the size of lending syndicates. I expect banks to design the structure and terms of loans while taking into account CEO incentives from inside debt and equity positions. They charge lower spreads and demand less protection when lending to firms whose managers are less likely to engage in debtholder expropriation.

2.2.2. CEO inside debt and relative leverage measure

Jensen and Meckling (1976) illustrate that whether managers have incentives to transfer wealth from debtholders to shareholders is determined by their relative ownership position in debt and equity. This insight is also borne out by theories developed by Edmans and Liu (2011). More specifically, when managers hold an equal percentage of both claims, they have no incentive to transfer wealth from debtholders to shareholders or vice versa. For example, if a CEO holds 10% of her company's equity and 10% of her company's debt, then each dollar of wealth transfer from debtholders to shareholders will result in 10 cents increase in the value of her equity ownership and 10 cents decline in the value of her debt ownership, leaving her overall wealth unchanged. More formally, if I use D_i and E_i to denote the market values of the CEO's debt and equity ownership and D_f and E_f to denote the market values of her firm's total debt and equity, the CEO will have no incentive to engage in wealth transfer if $\frac{D_i}{D_f} = \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} = \frac{D_f}{E_f}$.

On the other hand, if $\frac{D_i}{D_f} < \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} < \frac{D_f}{E_f}$, the CEO will be tempted to

engage in debtholder expropriation on behalf of shareholders. When $\frac{D_i}{D_f} > \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} > \frac{D_f}{E_f}$, the CEO's incentives will become more aligned with debtholders and lead her to take actions to transfer wealth from shareholders to debtholders.

To capture the above dynamics in CEO incentives from her debt and equity holdings, I construct a measure, *CEO relative leverage*, that is equal to her personal leverage or debt-equity ratio (D_i/E_i) divided by her company's leverage or debt-equity ratio (D_f/E_f). The CEO's debt-equity ratio is equal to the value of her inside debt position divided by the value of her equity holdings, where the former equals the CEO's accumulated deferred compensation plus the present value of her pension benefits as reported by the company, and the latter equals to the market value of her stock (including restricted stock and synthetic or performance shares) and stock option ownership. I compute the market value of stock ownership by multiplying the number of shares held by the fiscal year-end stock price, and compute the market value of stock options by applying the Black-Scholes (1973) formula to each individual tranche of options held by the CEO and then adding up the tranche values.[16] I measure firm leverage by the book value of long-term and short-term debt divided by the market value of equity.[17]

CEO relative leverage is an inverse measure of a CEO's incentives to engage in asset substitution to expropriate debtholders. CEOs with a relative leverage less than one tend to transfer wealth from debtholders to shareholders, and the reverse is true for CEOs with a relative leverage

[16] In applying the Black-Scholes formula to value executive stock options, I set the time-to-maturity of each tranche of options to either its full value or 70% of that to account for the early-exercising tendency of executives. Empirical results are not sensitive to this variation. Results presented in the paper are based on the full time to maturity of options.

[17] Following Wei and Yermack (2011), I also use an alternative construct of CEO relative leverage that is equal to $\frac{D_i / D_f}{\Delta E_i / \Delta E_f}$, where the denominator is the dollar change in the value of a CEO's stock and option portfolio per \$1 increase in firm equity value. The correlation between my current measure and this alternative measure is 0.855. All the results hold with this alternative measure.

above one. CEOs with a relative leverage equal to one are indifferent to wealth transfers between debtholders and shareholders in either direction. Since CEO relative leverage has a highly skewed distribution due to its propensity to have outliers, I take its logarithmic transformation to reduce the right-skewness in the original data. As an alternative, I construct a dummy variable, *high relative leverage*, that is equal to one if CEO relative leverage is above one or zero otherwise. This binary variable is robust to the influence of outliers, and it can also capture any nonlinearity in the relation between CEO relative leverage and bank loan contracting.

To ensure that the information on borrower CEO's inside debt position is available to banks when they make lending decisions, I construct CEO relative leverage measures based on the information disclosed in the borrower's most recent proxy statement filed prior to loan origination.[18] Specifically, given that 2007 is the first year when firms' proxy statements are required to report detailed information on inside debt, for a loan originated in 2007, I require that its origination date is after its borrower's proxy filing date in 2007. For a loan originated after 2007, if its origination date is after its borrower's proxy filing date in the loan origination year, I use the information disclosed in that year's proxy statement to construct CEO relative leverage; otherwise, CEO relative leverage is constructed using the information disclosed in previous year's proxy statement.

2.2.3. Control variables

Throughout my analysis, I control for an array of firm and loan characteristics and macroeconomic conditions that prior studies find related to the terms and structure of bank loans (e.g., Graham, Li, and Qiu (2008), Chava, Livdan, and Purnanandam (2009), Lin, Ma, Malatesta, and Xuan (2010), and Jiang, Li, and Shao (2010)). I present detailed definitions of these variables

[18] While banks as private lenders may have access to such information prior to its public disclosure through their close monitoring of and interactions with borrowing firms, one of my tests later in section 3.5 shows that firms' disclosures of executive pensions and deferred compensation actually convey new information to banks, thereby validating the empirical approach we take here.

in the Appendix. Specifically, firm level control variables include firm size, leverage, profitability, asset tangibility, market-to-book ratio, Altman's Z-score, and cash flow volatility. Since larger firms are subject to greater public scrutiny and receive more analyst coverage, they tend to be associated with less information asymmetry, limiting the potential for moral hazard and reducing the monitoring costs of lenders. As a result, I expect larger firms to enjoy lower borrowing costs. Firms with higher leverage ratios, higher cash flow volatility, lower profitability and lower Z-scores are associated with higher default risk and thus higher costs of debt. Firms with more tangible assets have higher recovery values in default, which allow them to borrow at relatively lower costs. The prediction on market-to-book ratio is unclear. On the one hand, firms with more growth opportunities are vulnerable to financial distress and have higher information asymmetry and therefore may face higher borrowing costs. On the other hand, if firms with higher market-to-book ratios can leave more excess value to creditors in the event of liquidation, they may be able to borrow more cheaply.

The loan characteristics I control for include the size, maturity, type, and purpose of a loan and whether a loan has a performance pricing feature. I measure loan size by the natural logarithm of the loan facility amount. To the extent that there is an economy of scale in bank lending, I expect yield spreads to be lower for larger loans. Loan maturity is measured in terms of months. Longer maturity loans expose creditors to greater credit risk and therefore may carry higher yield spreads. There are mainly two types of loans in my sample, term loans and revolver loans. I construct a dummy variable for revolver loans to control for any loan type effect. I create another dummy variable that is equal to one for loans with performance-based pricing to capture the possibility that banks may price loans with and without such a feature differently. Firms may use loans for different purposes such as working capital, acquisition, LBO and debt repayment. To the extent that these uses carry different risk to creditors and thus impact loan pricing, I control for loan purpose fixed effects.

The macroeconomic conditions I control for include term spread and credit spread, with the

former defined as the difference between the 10-year Treasury yield and the 1-year Treasury yield and the latter defined as the difference between AAA-rated corporate bond yield and BAA-rated corporate bond yield. I measure these variables on each loan's origination date. Finally, I control for industry fixed effects based on the Fama-French 48-industry classification and calendar year fixed effects.

2.3. Summary statistics

Panel A of Table 1 presents the summary statistics of the variables used in my analysis and Panel B presents their Person and Spearman correlations. I winsorize all continuous variables at the 1st and 99th percentiles to reduce the influence of outliers. CEO relative leverage has a median of 0.324 and a mean of 1.487, which is larger than the 75th percentile value of 1.415 and indicating a highly skewed distribution. The logarithmic transformation reduces the right skewness, as the mean is now between the median and the 75th percentile. The mean of the binary variable, *high relative leverage*, suggests that CEO relative leverage is above one in 30.4% of my sample observations, close to the 29% reported by Wei and Yermack (2011).[19]

The average (median) borrowing firm in my sample has a book value of total assets of $11.310 (2.566) billion, a leverage ratio of 0.284 (0.258), a market-to-book ratio of 1.643 (1.453), a return on assets (ROA) of 0.141 (0.130), a Z-score of 7.484 (3.932), a cash flow volatility of 0.037 (0.030), and an asset tangibility ratio of 0.325 (0.250). In light of the skewness in the original Z-score measure, I create a binary variable, *high Z-score*, that is equal to one if a firm's Z-score is above 1.81.

[19] In about 20% of my sample observations, CEOs have zero inside debt according to the information provided by ExecuComp. We search these firms' proxy statements and find that either they claim not to provide any pension or deferred compensation to their managers or they do not mention pension or deferred compensation at all. Since it is difficult to ascertain whether CEOs actually have inside debt for companies that fall in the second category, we delete observations with zero inside debt and re-estimate the loan spread regression in the subsample where CEO inside debt balance is positive. Untabulated results show that CEO relative leverage continues to have a significant and negative effect on loan spreads, suggesting that the findings are not driven by any potential data problem with ExecuComp.

With respect to loan characteristics, the mean (median) loan facility in the sample has a yield spread of about 220 (225) basis points (bps), a total principal amount of $668 (325) million, a maturity of 46.63 (50) months, 9.84 (8) banks in the lending syndicate, and 3.471 (4) covenants. Moreover, 50.3% of the loans in the sample have a performance based pricing feature, 62.7% of them are revolver loans, and 39.8% of them are secured by collaterals. Credit spread has a mean of 1.354% and a median of 1.14%, while term spread has a mean of 1.756% and a median of 1.94%.

Consistent with my hypothesis, CEO relative leverage and loan spread are negatively correlated. However, I am unable to make any causal inference based on that because I also observe that CEO relative leverage is positively correlated with ROA, Z-score, and asset tangibility, and negatively correlated with cash flow volatility. These latter correlations suggest that the negative relation between CEO relative leverage and loan spread could be spurious, since firms with lower cash flow volatility and higher ROA, Z-score, and asset tangibility are likely able to borrow at lower rates. Therefore, I turn the attention to multivariate regressions in the next section.

3. Empirical results

3.1. Baseline analysis of the effect of CEO inside debt on loan spreads

In this section I examine the impact of CEO inside debt positions on loan pricing using OLS regressions. My hypothesis is that banks charge lower yield spreads on loans made to borrowing firms where CEOs have a higher relative leverage and thus less incentive to expropriate debtholders to benefit shareholders. The baseline regression model is specified as follows:

Log (loan spread) = f(CEO relative leverage measure, firm characteristics, loan characteristics, macroeconomic conditions, and industry and year fixed effects).

Table 2 presents the regression results. Figures in the parentheses below coefficient estimates are t-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm-level clustering (Petersen (2009)). In columns (1) to (3), the key explanatory variable is

the logarithmic transformation of CEO relative leverage. In column (1), CEO relative leverage is the only explanatory variable other than loan-purpose, year and industry fixed effects. I find that it has a significantly negative coefficient. In column (2), when I control for firm and loan characteristics and macroeconomic conditions that could impact loan spreads, the coefficient on CEO relative leverage becomes smaller in magnitude but remains negative and significant at the 1% level. In column (3), I remove loan characteristics as control variables since they could be simultaneously determined with loan spreads and their presence in the regression could bias my coefficient estimates. I find that CEO relative leverage continues to have a significant and negative effect on loan spread.

In columns (4) and (5), I replace the continuous CEO relative leverage measure with the binary version, *high relative leverage*. I find that it has a significantly negative effect on loan spreads as well. These findings are consistent with my hypothesis that CEOs with higher relative leverage have incentives more aligned with debtholders and are less likely to engage in risk-shifting activities harmful to debtholders. Bank lenders take this into consideration in loan pricing and charge lower yield spreads.

The negative effect of CEO relative leverage on costs of bank loans is significant not only statistically as indicated by the *t*-statistics, but also economically. For example, the coefficient estimate of -0.097 on the binary variable, *high relative leverage*, in column (4) suggests that ceteris paribus, loan spreads are lower by about 10% or 22 bps for borrowing firms with CEO relative leverage above one than for those with CEO relative leverage below one. For loans with the average principal amount (about $668 million) and maturity (about 4 years) in my sample, this would translate into savings in interest expense in the amount of $1.47 million a year with a present value of around $4.87 million.[20] Overall, the results in Table 2 provide strong support for my hypothesis that inside debt ownership by CEOs reduces their risk-taking incentives and mitigates the agency costs of debt.

[20] We assume an 8% discount rate for computing the present value of interest expense savings.

With respect to the control variables, their effects on loan pricing are mostly consistent with extant evidence in the literature. Specifically, I find that firms that are larger and more profitable and have higher market-to-book ratios and lower bankruptcy risk enjoy significantly lower costs of borrowing from banks, while firms with higher leverage and cash flow volatilities pay significantly higher yield spreads on their bank loans. I also find that yield spreads are significantly higher for loans of longer maturity and lower for larger loans and revolver loans. Both credit spread and term spread are significantly and positively related to loan yields.

3.2. Expected agency costs of debt and the effect of CEO inside debt on loan spreads[21]

In this section, I explore whether the negative effect of CEO relative leverage on loan spreads is more pronounced for firms that face higher expected agency costs of debt, to the extent that inside debt plays a more important role at these firms in reducing managers' incentives to engage in asset substitution activities (Edmans and Liu (2011)). I proxy for a firm's potential for conflicts of interest between debtholders and shareholders by its credit rating, leverage, and growth options. Firms with poorer credit ratings and higher leverage are more likely to fall into financial distress, giving shareholders more incentives to act opportunistically against debtholders. Firms with more growth options have more opportunities to pursue risky investments, making creditor monitoring more difficult, and their assets also tend to have lower liquidation value. I capture a firm's growth options by its R&D expenditure.

To test my conjecture, I first partition my sample of 1,280 loans into two subsamples based on whether the borrower's S&P senior debt rating before loan origination is above or below the investment grade. I then estimate the loan spread regression on the subsamples separately and present the results in columns (1) and (2) of Table 3. I find that CEO relative leverage has a significantly negative effect on loan spread only in the below-investment-grade subsample. While

[21] All the findings in this and any subsequent sections are robust to using either the continuous or the binary measure of CEO relative leverage. For brevity, we only report the results based on the continuous measure, and those based on the binary measure are available upon request.

the coefficient on CEO relative leverage is still negative in the above-investment-grade subsample, it is not statistically significant. The difference in the coefficient between the subsamples is significant with a two-sided p-value of 0.02.

I also estimate the loan spread regression on subsamples formed based on whether the borrower's leverage before loan origination is above or below sample median (see columns (3) and (4)). I find that the coefficient on CEO relative leverage is significant and negative in both subsamples, but its magnitude is larger in the high-leverage subsample and the difference is significant with a two-sided p-value of 0.02.

Finally, I partition my sample based on whether the borrower has positive R&D expenditure during the fiscal year prior to loan origination. Subsample regression results presented in columns (5) and (6) indicate that CEO relative leverage has a significantly negative effect on loan spread only in the positive R&D subsample. The difference in its coefficient between the subsamples is significant with a two-sided p-value of 0.03. Overall, my findings in this section show that CEO inside debt plays a more important role in ameliorating creditor concern for expropriation and reducing costs of debt when firm attributes portend more serious conflicts of interest between debtholders and shareholders.

3.3. CEO expected retirement horizon and the effect of CEO inside debt on loan spreads

In this section, I examine whether banks take into account a CEO's expected retirement horizon relative to loan maturity in evaluating the impact of her inside debt position on loan pricing. Compared to CEOs who are expected to step down soon, CEOs who are expected to remain in office during a loan's entire maturity likely have greater potential to impact the loan's performance and repayment through their choices of investment and financial policies. Therefore, I predict that for the latter group of CEOs, their relative leverage has an economically larger effect on loan spreads. Alternatively, inside debt may have a more pronounced effect on loan spreads for CEOs closer to retirement. The reason is that left to their device, these CEOs may be tempted to take

excessive risk to increase short-term stock price at the expense of long-term firm value.[22] Inside debt, on the other hand, may discourage such opportunistic behavior by tying the fortune of retiring CEOs more closely with the long-term performance and survival of their firms.[23] As a result, creditors may especially value the inside debt positions of CEOs who are expected to retire soon.

To investigate these conjectures, I assume that creditors use the CEO's mandatory retirement age to determine whether a CEO is expected to retire before or after a loan matures. I recognize that the mandatory retirement age primarily governs voluntary retirements only and it is not always binding. CEOs may decide to retire earlier or later than that or may be terminated involuntarily. To the extent that these events are difficult to foresee for creditors and sometimes even for CEOs themselves, it is not an unreasonable assumption that creditors rely on the mandatory retirement age to form an expectation about how much longer a CEO is going to remain in office. Even though firms predominantly use 65 as the mandatory retirement age for CEOs, there may be some variations in the policy. To account for this possibility, I also use 62, 63, 64, and 66 as the mandatory retirement age and obtain very similar results. For brevity, I only report the evidence based on CEO mandatory retirement ages of 62 and 65.

For each pair of borrower and loan facility, I create a dummy variable, *D(retirement>maturity)*, that is equal to one if the difference between the CEO's age at loan origination and the mandatory retirement age is greater than the loan's maturity, i.e., the loan matures before the CEO is expected to retire. I then interact CEO relative leverage with *D(retirement>maturity)* and 1-*D(retirement>maturity)* respectively and replace CEO relative leverage with these two interaction terms as key explanatory variables in the loan spread regression. Table 4 presents the coefficient estimates of the modified model. Column (1) is based on a mandatory retirement age of 65 and column (2) is based on a mandatory retirement age of 62. I find that in both columns, CEO relative leverage has a significantly negative effect on loan spread only

[22] Retiring CEOs can also choose to live a "quiet life" by taking less risk to avoid potentially tarnishing their legacy and jeopardizing their pension and deferred compensation.
[23] This is assuming that they do not immediately cash out all of their pension and deferred compensation.

when *D(retirement>maturity)* is equal to one, i.e., when the CEO is not expected to retire until after the loan matures. When the CEO is expected to retire before loan maturity, the effect of CEO relative leverage on loan spread is negative but insignificant. These results are consistent with my conjecture that in the loan pricing process creditors put more weight on the incentives from CEO inside debt positions when a CEO is expected to remain in office over the entire life of a loan.

3.4. The effect of CEO inside debt on non-price characteristics of loans

As discussed in the introduction, a major advantage of studying bank loans rather than public bonds is that I can examine non-price characteristics of loans in addition to their pricing. Banks arrange and design loans according to their assessment of a borrowing firm's credit risk. As an alternative to demanding higher loan spreads to compensate for their credit risk exposure, banks can also put in place more covenants restricting the borrowing firm's activities that may harm debtholders, such as excessive dividend payment, asset sales, and additional debt financing (Smith and Warner (1979)). They can also require borrowing firms to provide collaterals to secure loan repayment. Furthermore, lead banks may bring more lenders into the lending syndicate to achieve better risk diversification. To the extent that inside debt aligns the incentives of managers with those of debtholders and leads to more conservative operating and financial policies (Sundaram and Yermack (2007)), I expect the loans made to firms with higher CEO relative leverage to have less covenant restriction, a lower likelihood of being secured, and a smaller lending syndicate.

I measure the extent of covenant restriction by the number of covenants included in a loan facility. However, the data on loan covenants are incomplete in DealScan (Chava et al. (2009) and Jiang et al. (2010)). To partially address this problem, rather than analyzing the number of covenants reported by DealScan, I create a dummy variable, *more covenants*, that is equal to one for loans whose number of covenants is above my sample median and zero otherwise.[24] In column (1) of Table 5, I estimate a probit model where *more covenants* is the dependent variable and CEO

[24] My results hold if we simply use the number of covenants as the dependent variable.

relative leverage is the key explanatory variable. The model includes the same set of control variables as in the loan spread regression. I find that CEO relative leverage has a significantly negative coefficient, indicating that banks impose fewer covenant restrictions on borrowing firms with higher CEO relative leverage.

In column (2) of Table 5, I estimate a probit model of the likelihood of a loan being secured by collaterals. I find that CEO relative leverage has a significant and negative coefficient from the regression, suggesting that lenders are less likely to demand collateral on loans to firms whose CEOs have less incentive to engage in risky activities to expropriate creditors. In column (3) of Table 5, I estimate a probit regression where the dependent variable is equal to one if a loan's syndicate size measured by the number of lenders participating in the loan is above sample median. Consistent with banks having less need for risk diversification when lending to firms with larger CEO inside debt positions, I find that syndicate size is negatively related to CEO relative leverage, and the relation is marginally significant at 0.01.[25]

Overall, the results in this section show that CEO inside debt not only impacts loan pricing but also non-price features of loans. The relations I identify all point to the same direction that banks recognize the negative effect of inside debt on managerial risk-taking incentives and they structure lending syndicates and design loan contracts accordingly.

3.5. Endogeneity of CEO relative leverage

So far my findings convey a consistent message that firms where CEOs have a higher relative leverage can borrow at lower costs. One interpretation of this finding is that CEOs with higher relative leverage due to their inside debt holdings have incentives more aligned with debtholders, who as a result are less worried about expropriation and are willing to grant more

[25] One potential explanation for the relatively low significance of the negative relation is that higher CEO relative leverage could also lead to larger syndicate size. Specifically, when borrowers have higher CEO relative leverage and thus present less expropriation risk to creditors, there may be less need for monitoring from concentrated ownership by lending banks. As a result, the lead bank is able to reduce its share of lending by bringing more lenders into the syndicate.

lenient terms on their loans. However, the endogenous nature of CEO relative leverage suggests an alternative explanation. That is, it is possible that CEOs accumulate larger inside debt positions and have higher relative leverage at firms with lower default risk, and these firms enjoy lower costs of borrowing because of their lower risk. In other words, the negative relation between CEO relative leverage and loan spreads I identify is spurious rather than causal and is driven by some credit risk related variable(s) omitted from my regressions.

While this explanation is plausible, I do not believe that it can completely account for my findings. On the conceptual level, the endogeneity-driven interpretation may be able to explain the negative relation between loan spreads and CEO relative leverage, but it is unable to explain the statistically significant cross-sectional variations in the CEO relative leverage-loan spread relation along the dimensions of firm and CEO characteristics (Tables 3 and 4). In particular, the results in Table 3 suggest that the negative effect of CEO relative leverage on loan spreads is more pronounced for firms or loans that subject creditors to greater credit risk and shareholder expropriation. This is consistent with CEO inside debt playing a more valuable role in alleviating the shareholder-debtholder conflict in such situations. However, the endogeneity-based interpretation offers no such prediction.

In addition to the above arguments, I address the endogeneity problem using two empirical approaches. The first approach takes advantage of the first-time mandatory disclosure by firms in 2007 of their executive pensions and deferred compensation information and explores the within-firm changes in loan spread around the initial disclosure. For firms that obtain bank loans in both the year before and the year after the initial disclosure, I examine whether they experience any change in loan spread around the disclosure that is negatively related to CEO relative leverage implied by the disclosed inside debt position. This approach is analogous to the event study in Wei and Yermack (2011). By focusing on within-firm differences, it is able to filter out the influence of any unobservable time-invariant firm attributes. This test can also shed light on the question of whether firms' disclosures of executive pensions and deferred compensation actually provide new

information to banks. While Wei and Yermack (2011) show that these disclosures convey new information to the public bond holders, banks as private lenders may have access to such information prior to its public disclosure through their close monitoring of and interactions with borrowing firms. If this indeed were the case, I would not observe any change in loan spreads due to the disclosure of inside debt information. Therefore, a byproduct of this test is to validate my earlier empirical approach that relates loan terms to CEO relative leverage constructed using the information from the most recent proxy statement prior to loan origination.

I identify from the ExecuComp-DealScan intersection a sample of 124 firms that obtained at least one bank loan both in the year before and in the year after the filing date of their proxy statements in 2007. For each firm, I retain its last loan originated before the proxy filing and all the loans originated in the year after the proxy filing. I create 201 pairs of pre- and post-disclosure loans to the same firm and for each pair compute the change in the log-transformed yield spread from before to after disclosure. I then regress the loan spread change against CEO relative leverage measured based on the disclosed inside debt position, while controlling for changes in borrower and loan characteristics and macroeconomic conditions.[26]

I present the regression results in Table 6. We can find that the loan spread changes are significantly and negatively related to CEO relative leverage, irrespective of the presence of control variables. This evidence suggests that firms' initial disclosures of inside debt information in 2007 convey new information to banks and that all else being equal, banks reduce the loan spread they charge to firms that are revealed to have a higher CEO relative leverage due to inside debt holdings. This is consistent with my hypothesis that debt ownership reduces managerial incentive to expropriate debtholders and mitigates the agency costs of debt.

My second approach to addressing the endogeneity concern is to estimate a two-stage least squares (2SLS) regression. I select two instrument variables for CEO relative leverage. One is the

[26] Since there are more than ten loan purposes, we simply create a dummy variable, ΔLoan purposes, that is equal to one if the purpose of the loan originated after the initial disclosure is different from that prior to the disclosure, and zero otherwise.

top personal income tax rate for the state where a firm is headquartered, and the other is a Gibbs estimate of a firm's effective equity trading costs developed by Hasbrouck (2009).[27] I expect the state personal income tax rate to be positively related to CEO relative leverage, as higher tax rates may induce CEOs to defer more of their current compensation.[28] The equity trading cost measure is likely to be negatively related to CEO relative leverage, since higher transaction costs may discourage CEOs from dispensing the shares they receive either as direct compensation or as a result of exercising options. Neither the state personal income tax rate nor a firm's equity trading cost suggests a direct and theoretically sensible linkage with loan pricing. I later verify the exogeneity of my instruments via an over-identification test.[29]

Table 7 presents the 2SLS regression results. In the first stage, I find that the state personal income tax rate has a significant and positive effect on CEO relative leverage, while the Gibbs estimate of equity trading costs has a significant and negative effect, both consistent with my conjectures. The adjusted partial R-squared attributed to the two instruments is 2.00%, which is statistically significant with a *p*-value less than 0.0001. These results suggest that the instruments satisfy the relevance condition. Having two instruments and only one endogenous variable allows an over-identification test, which produces a Hansen's *J* statistics that is indistinguishable from zero (*p*-value: 0.45). This suggests that the instruments also satisfy the exogeneity condition. In the second stage, I find that the instrumented version of CEO relative leverage continues to have a significant and negative effect on loan spreads. Therefore, the evidence from 2SLS regressions indicates that my findings are robust to correcting for endogeneity.

---

[27] Hasbrouck (2009) uses a Gibbs sampler (a Bayesian technique) to estimate a generalized version of the Roll (1984) model. The approach generates annual estimates of firm-level effective trading costs using daily stock closing prices. Hasbrouck shows that the Gibbs estimates of firms' stock trading costs are highly correlated with trading costs estimated using high-frequency data.

[28] Kim and Lu (2011) also uses state personal income tax rate as an instrument in their investigation of CEO equity ownership on firm value.

[29] We obtain very similar results when using the state personal income tax rate as the only instrument variable. We choose to use both instruments since this would allow us to provide a formal evaluation of the exogeneity of the instruments via an over-identification test under the assumption that one of the instruments is valid.

3.6. Pension vs. deferred compensation

My analysis so far has treated executive pensions and deferred compensation as equivalent in computing CEO relative leverage. However, the two forms of compensation differ in at least two aspects that could impact the incentives they provide to managers. First, in contrast to pensions, which will pay benefits only when CEOs reach a mandatory age, deferred compensation can be withdrawn early, though usually with a hefty penalty (Wei and Yermack (2011)). By providing managers with an opportunity to cash out prior to performance deterioration and default events, the early withdrawal provision potentially weakens the risk-reducing incentives from deferred compensation in comparison to pensions. Second, firms sometimes allow executives' deferred compensation to be invested in their own equity (Wei and Yermack (2011)), which to some extent negates the debt-like nature of deferred compensation and again weakens the risk-reducing incentives it provides.

In light of these differences, I construct two CEO relative leverage measures, one based on pension value only and the other based on deferred compensation only. I include these newly constructed CEO relative leverage measures either separately or jointly in the loan spread regressions, and present the results in Table 8. I find that the pension-based CEO relative leverage has a significantly negative effect on loan spread, and the coefficient on the deferred compensation-based CEO relative leverage is negative but insignificant. These results suggest that consistent with our expectations, executive pensions indeed are more effective than deferred compensation in reducing managers' incentive to engage in excessive risk taking and debtholder expropriation.

3.7. Robustness tests

In addition to firm and loan characteristics and macroeconomic conditions, I also control for CEO age and CEO tenure in the loan spread regression, since these CEO attributes may be

related to both costs of borrowing and CEO relative leverage.[30] However, as shown in columns (1) to (3) of Table 9, neither of the two variables enters the regression significantly, and their presence has no impact on the magnitude and significance of the coefficient on CEO relative leverage.

In another robustness test, I add the borrower's credit rating as an additional control to the loan spread regression. A problem that complicates this task is that credit rating is endogenously determined and likely related to CEO inside debt and equity positions, as credit rating agencies take into account executive compensation in evaluating the creditworthiness of companies (Standard & Poor's (2004)). Therefore, including credit rating directly in the loan spread regression may bias the coefficient estimates from the regression. To deal with this issue, I create a binary variable, *investment grade*, that is equal to one if a firm's S&P senior debt rating is of investment grade and regress it against CEO relative leverage. The residual from the regression is orthogonal to CEO relative leverage. I re-estimate the loan spread regression with the residual of *investment grade* as an additional control variable. Results presented in column (4) of Table 9 indicate that the *investment grade* residual has a significant and negative effect on loan spread, consistent with more creditworthy companies enjoying lower costs of debt. More importantly, CEO relative leverage continues to have a significantly negative effect on loan spread, and its coefficient is both larger and statistically more significant than in Table 2.[31]

To the extent that some loan facilities come from the same loan deal taken out by a borrower, they may not be completely independent of each other. To address this potential concern, I follow Santos (2010) and select the facility with the largest principal amount from deals with multiple facilities while keeping deals with only one facility. This treatment reduces the number of loan facilities in my sample from 1,280 to 972. I re-estimate the loan spread regression in this smaller sample. The results presented in column (5) of Table 9 show that the coefficient on CEO

[30] While older and longer-tenured CEOs may have accumulated more pensions and deferred compensation, they likely have amassed larger holdings of stock and stock options as well. Therefore, it is unclear whether these CEOs have higher or lower relative leverage.

[31] The results are also robust to controlling for the un-orthogonalized investment-grade dummy variable, despite its clearly endogenous nature and correlation with CEO relative leverage.

relative leverage remains negative and significant, and both its magnitude and statistical significance are very similar to what I find in Table 2.

Finally, the time period of my study encompasses the Global Financial Crisis of 2008-2009, during which bank lending decisions may be drastically different from those during normal market conditions. Therefore, one potential concern is whether my findings are primarily driven by this historic episode. To investigate this issue, I exclude bank loans originated in 2008 and 2009 from my sample and re-estimate the loan spread regression in the remaining subsample of loans in 2007 and 2010. Results presented in column (6) of Table 9 show that the effect of CEO relative leverage on loan spread remains negative and statistically significant, suggesting that my findings are not driven by loans originated during the Global Financial Crisis of 2008-2009.[32]

4. Conclusion

I examine the implications of executive deferred compensation and pension benefits for bank loan contracting. These debt-like claims held by managers against their own firms, i.e., inside debt, align the incentives of managers more closely with those of debtholders, thereby alleviating debtholder concerns about expropriation and reducing agency costs of debt. Consistent with this conjecture, I find in a sample of bank loans that firms with larger CEO inside debt positions are able to borrow at significantly lower yield spreads, especially in the presence of higher expected agency cost of debt proxied by poorer credit rating, higher leverage, and more R&D expenditures. The negative effect of CEO inside debt on loan spreads is also stronger when the expected retirement horizon of CEOs is beyond loan maturity. I further find that loans to firms with larger CEO inside debt positions are associated with fewer covenant restrictions, less collateral requirement, and smaller lending syndicates, evidence consistent with creditors being less

[32] We also estimate the loan spread regression for 2007 and 2010 separately and find that CEO relative leverage has a significantly negative effect on loan spread in both years. This indicates that the results are also not driven by lending booms, a description that may fit part of 2007 but that obviously does not fit 2010.

concerned about shareholder expropriation at these companies.

Overall, these empirical findings suggest that banks recognize the negative effect of inside debt on managers' risk-taking incentives and offer more generous lending terms to firms where executives have accumulated larger inside debt positions. While deferred compensation and especially executive pension have received criticism as forms of stealth compensation and private benefits that are costly to shareholders, my study highlights that they do provide some benefits, one of which is to reduce a firm's costs of borrowing. Therefore, it appears that a careful cost-benefit analysis is warranted to determine a firm's optimal policy on these forms of executive pay.

A.2 Tables for chapter two

Appendix: Variable definitions

Variable	Definition
CEO inside debt	Sum of CEO deferred compensation and pension value
CEO inside equity	Market value of CEO stock and stock option holdings
CEO personal leverage	The ratio of CEO inside debt to inside equity
CEO relative leverage	CEO personal leverage divided by firm leverage, where firm leverage is equal to the book value of long-term and short-term debt (DLTT + DLC) divided by the market value of equity (PRCC_F * CSHO).
High relative leverage	A dummy variable equal to one if CEO relative leverage is greater than one
Spread	All-in spread drawn, defined as the amount the borrower pays in basis points over LIBOR or LIBOR equivalent for the drawn portion of the loan facility plus any annual fees
Firm size	Book value of total assets (AT)
Leverage	Book value of total debt (DLTT + DLC) divided by book value of total assets (AT)
M/B ratio	Market value of total assets (AT - CEQ + PRCC_F × CSHO) divided by book value of total assets (AT)
ROA	Ratio of EBITDA (OIBDP) to total assets (AT)
Z-score	Altman's Z-score computed as 3.3 × OIADP/AT + 1.2 × (ACT- LCT)/AT + SALE /AT + 0.6 × PRCC_F × CSHO / (DLTT + DLC) + 1.4 × RE/AT
High Z-score	A dummy variable equal to one if Altman's Z-score is larger than 1.81 and zero otherwise.
CF volatility	Standard deviation of the ratio of operating cash flows to total assets (OANCF/ AT) over the past five years
Tangibility	Net property, plant and equipment (PPENT) divided by book value of total assets (AT)
Loan amount	Amount of a loan facility
Loan maturity	Maturity of a loan facility
Performance pricing	A dummy variable equal to one for loan facilities that use performance pricing and zero otherwise
Revolver	A dummy variable equal to one for revolver loans and zero otherwise
Term spread	The difference between the 10-year Treasury yield and the 1-year Treasury yield
Credit spread	The difference between AAA-rated corporate bond yield and BAA-rated corporate bond yield
More covenants	A dummy variable equal to one for loans whose number of covenants is above sample median
Secured	A dummy variable equal to one for loan facilities secured by collateral and zero otherwise
Syndicate size	Number of lenders in a lending syndicate
Tax rate	Top personal income tax rate of the state where a firm is headquartered
Gibbs estimate	Gibbs estimate of a firm's equity trading costs developed by Hasbrouck (2009)

Table 1. Summary statistics

The sample consists of 1,280 loan facility level observations. Variable definitions are in the Appendix.

Panel A: Descriptive statistics								
	N	Mean	Stdev	P10	Q1	Median	Q3	P90
Inside debt, D_i (mil $)	1280	6.933	14.562	0.000	0.040	1.961	7.896	17.252
Inside equity, E_i (mil $)	1280	81.690	730.123	2.670	6.901	17.791	44.591	102.993
CEO personal leverage, D_i/E_i	1280	0.525	2.756	0.000	0.001	0.095	0.393	0.937
CEO relative leverage	1280	1.487	3.863	0.000	0.003	0.324	1.415	3.309
High relative leverage (=1 if CEO relative leverage>1)	1280	0.304	0.460	0.000	0.000	0.000	1.000	1.000
Log(1+CEO relative leverage)	1280	0.551	0.691	0.000	0.003	0.281	0.882	1.461
Total assets (bil $)	1280	11.310	44.429	0.535	1.107	2.566	7.558	22.178
Leverage	1280	0.284	0.181	0.079	0.160	0.258	0.377	0.499
M/B ratio	1280	1.643	0.706	0.987	1.128	1.453	1.943	2.505
ROA	1280	0.141	0.074	0.068	0.097	0.130	0.173	0.227
Z-score	1280	7.484	14.410	1.244	2.405	3.932	7.267	13.781
High Z-score (dummy)	1280	0.837	0.370	0.000	1.000	1.000	1.000	1.000
CF volatility	1280	0.037	0.029	0.012	0.018	0.030	0.047	0.074
Tangibility	1280	0.325	0.243	0.065	0.127	0.250	0.499	0.717
Loan spread (bps)	1280	219.988	154.112	40.000	100.000	225.000	300.000	400.000
Loan amount (mil $)	1280	667.834	1060.872	65.000	147.500	325.000	750.000	1500.000
Loan maturity (months)	1280	46.630	20.062	12.000	36.000	50.000	60.000	65.000
Performance pricing	1280	0.503	0.500	0.000	0.000	1.000	1.000	1.000
Revolver	1280	0.627	0.484	0.000	0.000	1.000	1.000	1.000
Number of covenants	1280	3.471	3.303	0.000	0.000	4.000	6.000	8.000
Secured	1280	0.398	0.490	0.000	0.000	0.000	1.000	1.000
Syndicate size	1280	9.840	8.243	2.000	4.000	8.000	13.000	21.000
Credit spread (%)	1280	1.354	0.633	0.880	0.950	1.140	1.410	2.670
Term spread (%)	1280	1.756	1.160	0.000	0.570	1.940	2.710	3.165
Investment grade	1280	0.323	0.468	0.000	0.000	0.000	1.000	1.000
Gibbs estimate (*1000)	1269	2.967	1.608	1.387	1.724	2.467	3.722	5.605
Tax rate	1269	0.047	0.033	0.000	0.030	0.053	0.069	0.090

Panel B Pearson (top) and spearman (bottom) correlations											
	Log(loan spread)	Log(1+CEO relative leverage)	Log(total assets)	Leverage	M/B ratio	ROA	High Z-score	CF volatility	Tangibility	Log(loan amount)	Log(loan maturity)
Log(loan spread)		-0.242	-0.333	0.241	-0.392	-0.252	-0.249	0.156	0.021	-0.351	0.036
Log(1+CEO relative leverage)	-0.284		0.159	-0.329	0.148	0.102	0.164	-0.020	-0.058	0.116	-0.135
Log(total assets)	-0.271	0.261		0.106	-0.038	0.016	-0.191	-0.289	0.184	0.650	-0.221
Leverage	0.247	-0.231	0.161		-0.152	-0.057	-0.467	-0.104	0.165	-0.020	-0.004
M/B ratio	-0.461	0.110	0.001	-0.268		0.536	0.289	0.006	-0.153	0.110	0.046
ROA	-0.265	0.089	0.041	-0.185	0.597		0.242	-0.021	0.083	0.129	0.069
High Z-score	-0.286	0.132	-0.171	-0.460	0.371	0.296		0.033	-0.278	0.037	0.093
CF volatility	0.142	-0.099	-0.315	-0.154	-0.055	-0.064	0.076		-0.083	-0.196	0.054
Tangibility	0.031	0.050	0.223	0.226	-0.136	0.100	-0.258	-0.096		0.116	-0.025
Log(loan amount)	-0.306	0.178	0.656	0.011	0.154	0.147	0.030	-0.196	0.129		-0.027
Log(loan maturity)	-0.031	-0.138	-0.152	-0.014	0.117	0.103	0.109	0.043	-0.022	0.060	

Table 2. The effect of CEO inside debt on loan spread

This table presents the regression results of the effect of CEO inside debt on loan spreads. The dependent variable is the logarithm of loan spreads in basis points. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Log(1+CEO relative leverage)	-0.230***	-0.097***	-0.106***		
	(-6.19)	(-3.09)	(-3.21)		
High relative leverage				-0.097**	-0.107**
(=1 if CEO relative leverage>1)					(-2.24)
				(-2.19)	
Log(total assets)		-0.127***	-0.169***	-0.132***	-0.174***
		(-5.61)	(-9.31)	(-5.81)	(-9.64)
Leverage		0.340***	0.400***	0.392***	0.458***
		(2.67)	(3.06)	(3.06)	(3.47)
M/B ratio		-0.211***	-0.213***	-0.215***	-0.217***
		(-5.61)	(-5.38)	(-5.62)	(-5.38)
ROA		-1.013***	-0.956***	-1.022***	-0.963***
		(-3.05)	(-2.81)	(-3.03)	(-2.78)
High Z-score		-0.197***	-0.225***	-0.199***	-0.227***
		(-2.68)	(-2.98)	(-2.69)	(-2.98)
CF volatility		2.539***	2.494***	2.530***	2.480***
		(3.31)	(3.05)	(3.28)	(3.02)
Tangibility		-0.078	-0.139	-0.097	-0.160
		(-0.66)	(-1.15)	(-0.82)	(-1.31)
Log(loan amount)		-0.060***		-0.059***	
		(-2.65)		(-2.62)	
Log(loan maturity)		0.179***		0.184***	
		(5.11)		(5.24)	
Performance pricing		0.038		0.037	
		(0.91)		(0.90)	
Revolver		-0.215***		-0.215***	
		(-6.87)		(-6.92)	
Credit spread		0.250***	0.248***	0.246***	0.243***
		(6.70)	(6.48)	(6.57)	(6.32)
Term spread		0.176***	0.162***	0.173***	0.158***
		(3.82)	(3.40)	(3.71)	(3.28)
Loan purposes fixed effects	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included
Year Fixed effects	Included	Included	Included	Included	Included
No. of observations	1,280	1,280	1,280	1,280	1,280
Adj. R-squared	0.53	0.69	0.67	0.68	0.66

Table 3. The effect of expected agency costs of debt on the CEO inside debt-loan spread relation

This table presents the subsample regression results of the effect of CEO inside debt on loan spreads. The subsamples are formed based on whether a firm's S&P credit rating is above or below investment grade in columns (1) and (2), whether a firm's leverage at loan origination is above or below sample median in columns (3) and (4), and whether a firm's R&D expenditure in the year prior to loan origination is positive or zero in columns (5) and (6). The dependent variable is the logarithm of loan spread in basis points. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Above Investment Grade	Below Investment Grade	Low Leverage	High Leverage	Zero R&D	Positive R&D
Log(1+CEO relative leverage)	-0.035	-0.096***	-0.107***	-0.173**	-0.062	-0.131**
	(-0.64)	(-2.86)	(-3.04)	(-2.59)	(-1.61)	(-2.47)
Log(total assets)	-0.113**	-0.033	-0.181***	-0.098***	-0.099***	-0.167***
	(-2.17)	(-1.48)	(-6.34)	(-3.21)	(-3.07)	(-5.57)
Leverage	0.574*	0.216**	-0.085	0.769***	0.283**	0.439
	(1.66)	(2.06)	(-0.23)	(3.28)	(2.06)	(1.55)
M/B ratio	-0.253***	-0.130***	-0.136***	-0.318***	-0.248***	-0.232***
	(-4.40)	(-4.01)	(-3.35)	(-4.98)	(-4.06)	(-4.30)
ROA	-0.024	-0.741***	-1.122***	-0.929*	-0.926***	-0.636
	(-0.03)	(-2.96)	(-2.85)	(-1.72)	(-2.63)	(-0.95)
High Z-score	-0.304***	-0.095	-0.241*	-0.150	-0.169**	-0.242
	(-2.91)	(-1.43)	(-1.81)	(-1.57)	(-2.19)	(-1.50)
CF volatility	2.780*	1.883***	2.102**	2.904**	1.650*	3.979***
	(1.77)	(2.71)	(2.08)	(2.38)	(1.66)	(3.41)
Tangibility	-0.426**	-0.183*	-0.169	-0.077	-0.218*	-0.179
	(-2.41)	(-1.68)	(-1.08)	(-0.47)	(-1.69)	(-0.64)
Log(loan amount)	-0.074	-0.025	-0.045	-0.050*	-0.075***	-0.021
	(-1.63)	(-1.34)	(-1.54)	(-1.70)	(-2.66)	(-0.58)
Log(loan maturity)	0.140**	0.070	0.109**	0.180***	0.126***	0.202***
	(2.59)	(1.63)	(2.49)	(3.95)	(2.88)	(3.72)
Performance pricing	0.192***	-0.113***	0.081	0.032	-0.049	0.118*
	(3.16)	(-2.84)	(1.47)	(0.52)	(-0.93)	(1.83)
Revolver	-0.183**	-0.142***	-0.209***	-0.220***	-0.210***	-0.188***
	(-2.55)	(-4.66)	(-4.39)	(-5.48)	(-5.39)	(-3.92)

Credit spread	0.324***	0.206***	0.280***	0.229***	0.218***	0.330***
	(4.78)	(5.42)	(4.52)	(4.79)	(4.83)	(5.34)
Term spread	0.104	0.201***	0.183***	0.169***	0.178***	0.192**
	(1.33)	(4.45)	(2.60)	(2.68)	(2.98)	(2.49)
Loan purpose fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
No. of observations	413	867	638	642	745	535
Adj. R-squared	0.76	0.62	0.72	0.68	0.67	0.73

Table 4. The effect of CEO expected retirement horizon on CEO inside debt-loan spread relation

This table presents results from loan spread regressions where I replace measures of CEO relative leverage with their interaction terms with *D(retirement>maturity)* and (1-*D(retirement>maturity)*), where *D(retirement>maturity)* is defined as a dummy variable equal to one if a loan matures before a CEO is expected to retire. Results in column (1) are based on a CEO mandatory retirement age of 65 while those in column (2) are based on a mandatory retirement age of 62. The dependent variable is the logarithm of loan spread in basis points. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)
	Mandatory retirement age: 65	Mandatory retirement age: 62
Log(1+CEO relative leverage)× D(retirement>maturity)	-0.113***	-0.129***
	(-3.18)	(-3.06)
Log(1+CEO relative leverage) × (1- D(retirement>maturity))	-0.044	-0.082
	(-0.79)	(-1.59)
D(retirement>maturity)	0.000	-0.033
	(0.00)	(-0.66)
Log(total assets)	-0.127***	-0.108***
	(-5.62)	(-4.11)
Leverage	0.338***	0.447***
	(2.65)	(3.23)
M/B ratio	-0.212***	-0.210***
	(-5.62)	(-5.12)
ROA	-1.000***	-1.046***
	(-3.01)	(-3.11)
High Z-score	-0.197***	-0.187**
	(-2.68)	(-2.51)
CF volatility	2.547***	2.654***
	(3.31)	(3.37)
Tangibility	-0.079	-0.081
	(-0.67)	(-0.63)
Log(loan amount)	-0.059***	-0.068***
	(-2.65)	(-2.61)
Log(loan maturity)	0.171***	0.172***
	(4.82)	(4.95)
Performance pricing	0.039	0.023
	(0.95)	(0.56)
Revolver	-0.216***	-0.208***
	(-6.92)	(-6.61)
Credit spread	0.253***	0.249***
	(6.78)	(6.56)
Term spread	0.176***	0.164***
	(3.80)	(3.38)
Loan purpose fixed effects	Included	Included
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
No. of observations	1,280	1,280
Adj. R-squared	0.69	0.69

Table 5. The effect of CEO inside debt on nonprice characteristics of loans

This table presents the results from regressions of nonprice loan characteristics against CEO inside debt. In columns (1), the dependent variable is a dummy variable equal to one for loans whose number of covenants is above sample median; in columns (2), the dependent variable is a dummy variable equal to one for loans that are secured by collaterals; in columns (3), the dependent variable is a dummy variable equal to one for loans whose number of lenders is above sample median. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)
	More covenants (Probit)	Secured (Probit)	Larger syndicate (Probit)
Log(1+CEO relative leverage)	-0.291***	-0.335***	-0.139*
	(-2.73)	(-3.16)	(-1.65)
Log(total assets)	-0.174***	-0.232***	0.278***
	(-3.04)	(-3.90)	(5.11)
Leverage	-0.309	0.891**	-0.452
	(-0.76)	(2.26)	(-1.23)
M/B ratio	-0.347***	-0.193*	-0.073
	(-3.40)	(-1.93)	(-0.78)
ROA	-0.803	-3.032***	0.942
	(-0.88)	(-3.35)	(1.08)
High Z-score	-0.218	-0.177	0.233
	(-1.11)	(-0.83)	(1.24)
CF volatility	-1.558	6.577***	-2.579
	(-0.72)	(2.85)	(-1.13)
Tangibility	0.090	0.636*	-0.191
	(0.25)	(1.84)	(-0.60)
Log(loan amount)	-0.039	-0.039	0.370***
	(-0.72)	(-0.74)	(6.60)
Log(loan maturity)	0.124	0.341***	0.412***
	(1.32)	(3.44)	(3.68)
Performance pricing	0.743***	0.291***	0.936***
	(6.28)	(2.60)	(7.68)
Revolver	-0.324***	0.109	0.158
	(-3.85)	(1.20)	(1.51)
Credit spread	0.108	0.144	-0.093
	(1.05)	(1.36)	(-0.87)
Term spread	0.085	0.004	0.060
	(0.62)	(0.03)	(0.46)
Loan purposes fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
Year fixed effects	Included	Included	Included
No. of observations	1,280	1,280	1,280
Pseudo/adjusted R^2	0.27	0.29	0.35

Table 6. Loan spread changes around initial disclosures of inside debt information in 2007

This table presents the results from regressions of loan spread changes against CEO relative leverage implied by the borrower's initial disclosure of inside debt information in 2007. I obtain a sample of 124 firms that obtained at least one bank loan both in the year before and in the year after the filing date of their proxy statements in 2007. For each firm, I retain its last loan originated before the proxy filing and all the loans originated in the year after the proxy filing. I create 201 pairs of pre- and post-disclosure loans to the same firm. The dependent variable in the regressions is the change in the log-transformed yield spread from before to after disclosure for each pair of loans. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	Dep. Var.: ΔLog(loan spread)	
	(1)	(2)
Log(1+CEO relative leverage)	-0.289**	-0.275**
	(-2.49)	(-2.36)
ΔLog(total assets)		-0.111
		(-0.28)
ΔLeverage		0.550
		(0.54)
ΔM/B ratio		0.170
		(0.78)
ΔROA		-4.790*
		(-1.86)
ΔHigh Z-score		0.364**
		(1.99)
ΔCF volatility		1.122
		(0.23)
ΔTangibility		-1.338
		(-0.74)
ΔLog(loan amount)		-0.182***
		(-2.87)
ΔLog(loan maturity)		-0.122
		(-1.62)
ΔPerformance pricing		-0.030
		(-0.26)
ΔRevolver		0.069
		(0.77)
Δ Loan purposes		0.137
		(0.93)
ΔCredit spread		-0.733
		(-1.54)
ΔTerm spread		0.197*
		(1.77)
Industry fixed effects	Included	Included
No. of observations	193	193
Pseudo/adjusted R^2	0.11	0.30

Table 7. Two-stage least square (2SLS) regression of loan spreads

This table presents the results of two-stage least squares regressions of loan spread, where CEO relative leverage is instrumented by (i) the top personal income tax rate in the state where a firm is headquartered and (ii) the Gibbs estimate of a firm's equity trading costs developed by Hasbrouck (2009). Definitions of all variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) First stage Dep var: log(1+CEO relative leverage)	(2) Second stage Dep var: log(loan spread)
Log(1+CEO relative leverage)		-0.701***
		(-2.62)
Tax rate	2.220***	
	(2.72)	
Gibbs estimate	-0.046**	
	(-2.44)	
Log(total assets)	0.089***	-0.058
	(3.39)	(-1.49)
Leverage	-0.186	0.356
	(-0.82)	(1.50)
M/B ratio	-0.136**	-0.294***
	(-2.24)	(-4.61)
ROA	-0.214	-1.319***
	(-0.47)	(-2.87)
High Z-score	0.405***	0.255*
	(4.74)	(1.82)
CF volatility	0.652	2.872***
	(0.67)	(2.86)
Tangibility	0.265*	0.087
	(1.69)	(0.55)
Log(loan amount)	-0.014	-0.069**
	(-0.64)	(-2.45)
Log(loan maturity)	-0.106***	0.110*
	(-2.80)	(1.94)
Performance pricing	0.023	0.057
	(0.50)	(1.13)
Revolver	-0.004	-0.217***
	(-0.13)	(-5.78)
Credit spread	0.021	0.270***
	(0.49)	(5.78)
Term spread	0.038	0.193***
	(0.72)	(3.47)
Loan purpose fixed effects	Included	Included
Industry fixed effects	Included	Included
Year fixed effects	Included	Included
No. of observations	1,269	1,269
Adj. R-squared	0.28	0.53

Table 8. Separation of inside debt into pensions and deferred compensation

This table presents the results from regressions of loan spread against CEO relative leverage measures based on pensions and deferred compensation separately. The dependent variable is the logarithm of loan spreads in basis points. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)
Log(1+CEO relative leverage from pension)	-0.126***		-0.118***
	(-3.18)		(-2.93)
Log(1+CEO relative leverage from deferred comp)		-0.065	-0.031
		(-1.56)	(-0.74)
Log(total assets)	-0.128***	-0.132***	-0.126***
	(-5.68)	(-5.83)	(-5.60)
Leverage	0.385***	0.399***	0.361***
	(3.09)	(3.05)	(2.80)
M/B ratio	-0.220***	-0.211***	-0.217***
	(-5.84)	(-5.50)	(-5.74)
ROA	-1.052***	-1.011***	-1.036***
	(-3.16)	(-2.98)	(-3.12)
High Z-score	-0.188**	-0.210***	-0.190***
	(-2.57)	(-2.84)	(-2.59)
CF volatility	2.560***	2.524***	2.558***
	(3.34)	(3.26)	(3.34)
Tangibility	-0.074	-0.094	-0.075
	(-0.63)	(-0.79)	(-0.63)
Log(loan amount)	-0.059***	-0.059***	-0.060***
	(-2.65)	(-2.61)	(-2.65)
Log(loan maturity)	0.177***	0.186***	0.176***
	(5.10)	(5.27)	(5.04)
Performance pricing	0.039	0.034	0.038
	(0.94)	(0.81)	(0.93)
Revolver	-0.214***	-0.215***	-0.215***
	(-6.82)	(-6.93)	(-6.84)
Credit spread	0.253***	0.248***	0.252***
	(6.80)	(6.62)	(6.76)
Term spread	0.176***	0.173***	0.177***
	(3.79)	(3.75)	(3.81)
Loan purposes fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
Year Fixed effects	Included	Included	Included
Observations	1,280	1,280	1,280
Adj. R-squared	0.69	0.68	0.69

Table 9. Robustness tests

This table presents the results from robustness tests of the effect of CEO inside debt on loan spreads. Regressions in columns (1)-(3) control for CEO age and tenure either separately or jointly. The regression in column (4) controls for a binary variable, *investment grade*, orthogonalized against CEO relative leverage, where *investment grade* is defined as equal to one if a borrower's S&P credit rating is above the investment grade. The regression in column (5) is estimated in a sample of loans constructed by selecting the largest loan facility from loan deals with multiple facilities and keeping loan deals with only one facility. Column (6) is based on the subsample of loans originated in 2007 and 2010. The dependent variable in all columns is the logarithm of loan spreads in basis points. Definitions of all the variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Log(1+CEO relative leverage)	-0.098***	-0.097***	-0.097***	-0.147***	-0.098***	-0.122***
	(-3.12)	(-3.09)	(-3.11)	(-4.79)	(-2.71)	(-3.20)
CEO age	0.001		0.000		-0.128***	-0.154***
	(0.19)		(0.12)		(-4.47)	(-5.34)
CEO tenure		0.001	0.001		0.393***	0.275*
		(0.24)	(0.18)		(3.04)	(1.80)
Investment grade (orthogonalized)				-0.503***	-0.227***	-0.233***
				(-8.96)	(-6.23)	(-4.28)
Log(total assets)	-0.127***	-0.127***	-0.127***	-0.072***	-0.802***	-1.464***
	(-5.61)	(-5.57)	(-5.57)	(-3.30)	(-2.72)	(-3.11)
Leverage	0.337***	0.338***	0.336***	0.256**	-0.159**	-0.282***
	(2.62)	(2.67)	(2.62)	(2.19)	(-2.32)	(-2.95)
M/B ratio	-0.211***	-0.211***	-0.211***	-0.166***	2.246***	3.449***
	(-5.57)	(-5.58)	(-5.57)	(-4.95)	(3.22)	(3.33)
ROA	-1.012***	-1.014***	-1.013***	-0.823***	-0.076	-0.091
	(-3.05)	(-3.05)	(-3.05)	(-2.74)	(-0.67)	(-0.60)
High Z-score	-0.198***	-0.198***	-0.198***	-0.148**	-0.060*	-0.050*
	(-2.68)	(-2.70)	(-2.69)	(-2.28)	(-1.85)	(-1.80)
CF volatility	2.540***	2.540***	2.541***	1.852**	0.185***	0.194***
	(3.31)	(3.31)	(3.30)	(2.56)	(4.74)	(4.12)
Tangibility	-0.079	-0.080	-0.080	-0.131	0.077*	-0.008
	(-0.67)	(-0.67)	(-0.68)	(-1.21)	(1.73)	(-0.16)
Log(loan amount)	-0.059***	-0.060***	-0.059***	-0.038*	-0.272***	-0.208***
	(-2.65)	(-2.65)	(-2.65)	(-1.82)	(-6.17)	(-5.55)
Log(loan maturity)	0.179***	0.179***	0.179***	0.115***	0.277***	0.258
	(5.10)	(5.11)	(5.10)	(3.48)	(6.99)	(1.31)

Performance pricing	0.038	0.038	0.038	0.071*	0.168***	0.093
	(0.91)	(0.91)	(0.91)	(1.84)	(3.50)	(1.54)
Revolver	-0.215***	-0.215***	-0.215***	-0.187***	-0.098***	-0.122***
	(-6.88)	(-6.87)	(-6.88)	(-6.53)	(-2.71)	(-3.20)
Credit spread	0.250***	0.250***	0.250***	0.242***	-0.128***	-0.154***
	(6.71)	(6.69)	(6.69)	(6.83)	(-4.47)	(-5.34)
Term spread	0.176***	0.176***	0.176***	0.154***	0.393***	0.275*
	(3.81)	(3.80)	(3.80)	(3.58)	(3.04)	(1.80)
Loan purposes fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
Year Fixed effects	Included	Included	Included	Included	Included	Included
No. of observations	1,280	1,280	1,280	1,280	972	751
Adj. R-squared	0.69	0.69	0.69	0.72	0.69	0.74

CHAPTER THREE MANAGERIAL OWENRSHIP OF DEBT AND ACCOUNTING CONSERVATISM

1. Introduction

Financial reporting conservatism, i.e., the practice of applying more stringent verifiability requirements to recognizing economic gains than to recognizing losses, has been a subject of considerable interest among accounting regulators, standard setters, practitioners, and researchers. One of the primary economic explanations for accounting conservatism is that it arises as a mechanism to facilitate contracting (Watts (2003a, b)).[33] In particular, conservatism plays an important role in debt contracting by mitigating the conflicts of interest between shareholders and creditors due to their divergent payoff structures (Watts and Zimmerman (1986) and Watts (2003a)). Consistent with this notion, recent research shows that debtholder demand for conservatism is higher in firms with larger dividend payout ratios, higher leverage, and more managerial risk-taking incentives from option ownership, i.e., characteristics suggesting greater shareholder-debtholder conflicts and higher expected agency costs of debt (e.g., Ahmed, Billings, Harris, and Morton (2002) and Ma and Martin (2010)).

In this chapter, I examine the relation between accounting conservatism and managerial ownership of debt. More specifically, I hypothesize that debtholder demand for conservatism decreases with the managerial ownership of debt. I also predict that the negative relation is more pronounced when the expected agency costs of debt are higher, since inside debt may play a more important role in mitigating debtholder-shareholder conflicts under such circumstances (Edmans and Liu (2011)).

[33] Other explanations include shareholder litigation, taxation, and regulation (Watts (2003a)).

In addition, given that it is costly for firms to adopt more conservative financial reporting, even if firms with lower managerial debt holdings agree ex ante to debtholders' demand for higher conservatism, they may not maintain that level ex post. Therefore, a critical assumption underlying my hypothesis is that firms can credibly commit to a higher level of accounting conservatism if required by debtholders. As a result, I expect to find more support among firms that can make such credible commitments. As suggested by Watts (2003a), Zhang (2008) and Nikolaev (2010), an important mechanism that ensures firms' credible commitment is that borrowing is a repeated game, where reneging on previous commitments tarnishes the reputation of firms and managers and makes it difficult for them to re-access the debt market. This argument implies that the negative relation between managerial ownership of debt and accounting conservatism should be stronger among firms that rely more heavily on debt financing and interact with debtholders on a more frequent basis.

To test my conjectures, I construct a relative leverage measure for a firm's CEO to capture her incentives to engage in debtholder expropriation activities. The CEO's relative leverage is equal to her personal debt-equity (D/E) ratio relative to her firm's D/E ratio, where the value of her debt holding is equal to the sum of her deferred compensation and defined-benefits pension and the value of her equity holding is the market value of her stock and stock option ownership. Edmans and Liu (2011) show that the higher the CEO's relative leverage, the less incentive she has to expropriate debtholders. In fact, when the CEO's relative leverage is above one, she may even have incentives to transfer wealth from shareholders to debtholders (Jensen and Meckling (1976) and Edmans and Liu (2011)).

I construct multiple empirical proxies for accounting conservatism. Consistent with prior studies such as LaFond and Roychowdhury (2008), Ma and Martin (2010), and Nikolaev (2010), I use the asymmetric timely loss recognition estimated from the Basu (1997) model as my primary measure. I also employ several alternatives including an accruals-based asymmetry measure (Ball and Shivakumar (2006)), the amount of negative non-operating accruals (Givoly and Hayn (2000) and Ahmed and Duellman (2007)), the difference between skewness in cash flows and earnings

(Givoly and Hayn (2000) and Beatty, Weber, and Yu (2008)), and a firm-year specific conservatism measure developed by Khan and Watts (2009). In addition, I construct a composite rank of conservatism measures to account for the possibility that each measure may capture only one aspect of conservatism and does so potentially with errors (Beatty, Weber, and Yu (2008) and Hui, Matsunaga, and Morse (2009)).

My analysis of 3,018 firm-year observations from 2007 to 2009 yields evidence strongly supportive of my hypothesis.[34] Specifically, controlling for a wide array of determinants of accounting conservatism, I find a significantly negative relation between conservatism and CEO relative leverage. This is consistent with inside debt aligning the incentives of managers and debtholders and reducing debtholder concerns about expropriation. Moreover, the negative relation between CEO relative leverage and accounting conservatism is significantly more pronounced in firms with higher default probabilities, lower Z-scores, more growth options, and greater CEO horizon problems, i.e., characteristics portending greater expropriation risk for debtholders. These results are in line with my expectation that inside debt plays a more important role in alleviating shareholder-debtholder conflicts at firms facing higher expected agency costs of debt. Consistent with the importance of credible commitments by firms, I also find that the negative effect of CEO relative leverage on accounting conservatism is significantly greater when (i) debt represents a larger fraction of firms' capital structure, (ii) firms rely more on short-term borrowing, and (iii) firms have borrowed repeatedly from a particular lender in the past, i.e., among firms that face greater costs in reneging on their pledge to maintain a higher conservatism level demanded by creditors.

While the findings are consistent with the hypothesis that CEO inside debt holdings reduce debtholder demand for accounting conservatism, the endogenous nature of CEO relative leverage spawns the possibility that the negative relation between CEO relative leverage and accounting

[34] My sample period starts in 2007 because in 2006 the Securities Exchange Commission (SEC) adopted new disclosure requirements for executive compensation mandating that firms with fiscal year ends on or after December 15, 2006 report the accumulated deferred compensation and pension benefits of their five highest paid executives.

conservatism I identify is spurious rather than causal. In other words, it could be driven by some omitted variables correlated with both CEO relative leverage and accounting conservatism. From a conceptual standpoint, I find it unlikely that the omitted variable problem is driving the results, since any omitted variable needs to be able to explain not only the negative relation between CEO relative leverage and accounting conservatism but also the relation's cross-sectional variation along the dimension of expected agency costs of debt as uncovered by my analysis.

Nevertheless, I directly address the endogeneity problem using a two-stage least squares (2SLS) approach. I select two instrumental variables for CEO relative leverage. One is the top personal income tax rate for the state where a firm is headquartered, and the other is a Gibbs estimate of a firm's effective equity trading costs developed by Hasbrouck (2009). I expect the state personal income tax rate to be positively related to CEO relative leverage, as higher tax rates may induce CEOs to defer more of their current compensation. The equity trading cost measure is likely to be negatively related to CEO relative leverage, since higher transaction costs may discourage CEOs from dispensing the shares they receive either as direct compensation or as a result of exercising options and thus result in larger equity holdings. I find that the two instruments satisfy both the relevancy and exogeneity conditions, and that CEO relative leverage continues to have a significant and negative effect on accounting conservatism measures after correction for endogeneity.

I perform two additional tests to further ameliorate the endogeneity concern. More specifically, I estimate a change-based regression as an alternative to the level-based regression and find that changes in CEO relative leverage has a significantly negative effect on changes in accounting conservatism. I also conduct an event study similar to that in Wei and Yermack (2011), where I focus on firms' first mandatory disclosure of inside debt information in 2007. I find that CEO relative leverage constructed using the information disclosed in a firm's 2007 proxy statement has a significantly negative impact on the firm's conservatism change from 2006 to 2007, suggesting that debtholders reduce their demand for accounting conservatism upon observing large inside debt ownership by CEOs.

Overall, I present robust evidence that managerial ownership of debt alleviates debtholders' concern about expropriation by shareholders and reduces their demand for financial reporting conservatism. This study complements recent studies by LaFond and Roychowdhury (2008) and Ma and Martin (2010), who focus on the effects of CEO stock and stock option ownership on accounting conservatism. Along with these two papers, I present a more complete picture about how CEO incentives arising from various compensation components influence firms' financial reporting choices. I also contribute to the accounting conservatism literature by presenting first evidence on the importance of a mechanism that allows firms to make credible commitments to maintain a high conservatism level. In particular, the repeated nature of borrowing imposes potentially significant costs on firms with close interactions with the debt market if they renounce their pledge to implement conservative financial reporting policies demanded by creditors.

Second, this study adds to the emergent body of research on managerial incentive effects from inside debt. Prior studies in this literature find that managerial debt holdings reduce firms' likelihood of default (Sundaram and Yermack (2007), bond price rises upon firms' disclosure of large inside debt positions (Wei and Yermack (2011)). I show in this chapter that managerial ownership of debt also impacts firms' financial reporting practice.

The remainder of the chapter is organized as follows. Section 2 reviews related literature and develops hypotheses. Section 3 discusses sample construction and variable definitions. Section 4 presents empirical results. Section 5 concludes.

2. Related literature and hypotheses

2.1. Inside debt and agency costs of debt

In their seminal paper, Jensen and Meckling (1976, pp. 352) examine the possibility of managerial debt holding, i.e., inside debt, and its effect on managerial incentives. They illustrate that inside debt reduces equity-holding managers' incentive to expropriate debtholders and mitigates the

agency costs of debt. Edmans and Liu (2011) formally analyze inside debt as part of an efficient compensation contract and show that it is a superior solution to agency costs of debt than cash compensation, because its value is contingent both on the probability of bankruptcy and on the firm's liquidation value in bankruptcy.[35] As a result, inside debt not only discourages managers' risk-shifting behavior and reduces bankruptcy risk, but also induces more managerial efforts to increase the firm's liquidation value.

Despite the early insight from Jensen and Meckling (1976), empirical research on inside debt has been scarce. The extant literature mostly focuses on the managerial incentive effects of equity-based compensation and establishes a large body of evidence on whether managerial stock and stock option ownership impacts firm performance, shareholder and debtholder value, and specific corporate decisions and policies.[36] Several recent studies, however, begin to examine managerial ownership of debt. Based on the voluntary disclosure of a sample of Fortune 500 companies from 1996 to 2002, Sundaram and Yermack (2007) conduct the first empirical investigation of inside debt by studying CEO pension plans. They document that for many CEOs the annual increase in the actuarial value of pension benefits represents a significant portion of their total compensation. In particular, for CEOs aged between 61 and 65, the pension-related compensation is on average 40% larger than the base salary and 23% of the size of equity-based pay. They also find that CEOs with larger pension values take less risk as captured by a distance-to-default measure.

More research follows after the SEC adopted in 2006 enhanced disclosure requirements that made systematic data on executive pensions and deferred compensation available. Wei and Yermack (2011) investigate stockholder and bondholder reactions to initial disclosures of CEO inside debt

[35] When firms file for bankruptcy, CEOs (and possibly other senior executives) will stand in line with other creditors for resolution of the bankruptcy and recovery of any value on their defined-benefits pension and deferred compensation claims. Since defined-benefits pensions and deferred compensation are almost always unfunded and unsecured (Sundaram and Yermack (2007)), their value bears a positive relation to firms' liquidation value in bankruptcy. As a result, they provide managers with incentives to not only avoid bankruptcy but also increase the liquidation value in bankruptcy, which is exactly what creditors prefer. In contrast, cash-based compensation encourages managers to avoid bankruptcy since they are paid only in solvency, but they do not induce managers to increase liquidation value in bankruptcy.

[36] See Core, Guay, and Larcker (2003) for a review of the literature.

holdings in early 2007. They find that upon revelation of large inside debt positions, bond prices increase, stock prices decrease, and the volatility of both types of securities declines. Tung and Wang (2010) focus on banks and find that inside debt holdings by bank CEOs are negatively related to bank risk taking during the Global Financial Crisis. Overall, the empirical evidence on inside debt supports the view that managerial debt holdings align the incentives of managers and debtholders and alleviate debtholder concerns about expropriation, thereby reducing agency costs of debt.

2.2. Agency costs of debt and conservatism

Accounting conservatism evolves as an efficient mechanism to facilitate debt contracting in the presence of agency costs of debt. Debt contracting creates demand for conservatism since debtholders are concerned more about timely recognition of bad news relative to good news due to their asymmetric payoff function (Basu (1997), Watts (2003a), and Ball and Shivakumar (2005)). Conservatism plays several roles in facilitating efficient debt contracting. By applying higher verifiability standards to gains than to losses, conservatism understates net assets and cumulative earnings, thereby limiting excessive payouts to shareholders (Watts (2003a)). By recognizing losses in a more timely fashion than gains, conservatism reduces managers' incentives to undertake highly risky projects with zero or negative NPVs that expropriate debtholders (Ball (2001), Watts (2003a), and Ma and Martin (2010)). Early recognition of losses also accelerates debt covenant violations and transfers of control rights to debtholders when firms experience adverse economic conditions (Zhang (2008)). In addition, conservatism makes debt covenants more binding in distress situations and thus improves their effectiveness in restricting managers' opportunistic behaviors (Nikolaev (2010)).

Consistent with the debt contracting explanation, researchers find that debtholder demand for conservatism is higher in firms with larger dividend payout ratios, higher leverage, and more managerial risk-taking incentives from option ownership, i.e., firms characterized by greater shareholder-debtholder conflicts and higher expected agency costs of debt (e.g., Ahmed, Billings, Harris, and Morton (2002) and Ma and Martin (2010)). In addition, Ball, Robin, and Sadka (2008)

document a positive relation between conservatism and debt market size across countries. Nikolaev (2010) shows that firms display a higher level of conservatism when public debtholders rely more heavily on covenants to protect against expropriation. Zhang (2008) finds that firms that are more conservative in their financial reporting are more likely to violate debt covenants after negative stock price shocks.

There is also evidence that accounting conservatism is effective in reducing agency costs of debt and alleviating the information asymmetry in the debt market. For example, firms with more accounting conservatism are associated with lower costs of debt (Ahmed et al. (2002) and Zhang (2008)) and lower bid-ask spreads in the secondary loan market (Wittenberg-Moerman (2008)).

2.3. Hypotheses

Both theories and evidence on accounting conservatism suggest that debtholders demand conservatism in financial reporting as a way to protect their interests against shareholder expropriation. The literature on inside debt, on the other hand, points out that managerial ownership of debt reduces managers' incentive to expropriate debtholders on behalf of shareholders. Therefore, I expect debtholders to demand less accounting conservatism at firms with larger inside debt positions held by managers. Thus, my first hypothesis is stated as following:

H1: Accounting conservatism is negatively related to managerial ownership of debt.

In addition, I expect the relation between accounting conservatism and managerial ownership of debt to vary with the extent to which debtholders are susceptible to shareholder expropriation. Previous research suggests that inside debt plays a more important role in mitigating debtholder-shareholder conflicts when such conflicts are more serious. As a result, I expect the effect of inside debt on debtholder demand for conservatism to be more pronounced in firms carrying higher expropriation risk to debtholders. My second hypothesis is stated as following:

H2: The negative relation between accounting conservatism and managerial ownership of debt is more pronounced in firms with higher potential expropriation risk for debtholders.

As with most studies on stakeholder demands for accounting conservatism,[37] an underlying assumption for my hypothesis is that firms can credibly commit to maintaining a high level of financial reporting conservatism that debtholders would demand when managerial debt holding is low. To facilitate debt contracting, an important consideration for firms to make and fulfill such a commitment is that borrowing is a repeated game, where reneging on a previous commitment damages the reputation of firms and managers and makes it difficult and costly for them to re-access the debt market in the future when additional financing needs arise (see, e.g., Nikolaev (2010), Watts (2003), and Zhang (2008)). An implication of this argument for my study is that the negative relation between managerial ownership of debt and accounting conservatism should be stronger among firms that rely more heavily on debt financing and interact with debtholders on a more frequent basis. I test this prediction, which is framed as my third hypothesis below, to provide more direct evidence on the validity and importance of the credible-commitment assumption.

H3: The negative relation between accounting conservatism and managerial ownership of debt is more pronounced among firms that are able to credibly commit to a higher level of conservatism if required by debtholders.

3. Data and variables

3.1. Sample construction

I begin my sample construction process with Standard & Poor's (S&P) ExecuComp database,

[37] See, e.g., Ahmed et al. (2002), Farber et al. (2010), Hui, Klasa, and Yeung (2010), LaFond and Roychowdhury (2008), Leung, Li, and Rui (2009), and Ma and Martin (2010).

which provides information on the stock and stock option ownership and the value of deferred compensation and pension benefits of the five highest paid executives at S&P 1500 companies. The Securities and Exchange Commission (SEC) adopted enhanced executive compensation disclosure requirements in 2006. The new regulations mandate that firms with fiscal year ends on or after December 15, 2006 provide detailed information on the computation and value of executive pension benefits and deferred compensation.

I then require that firms with inside debt information have necessary stock returns data from CRSP and financial statement data from Compustat that allow us to construct such variables as the annual buy-and-hold returns, net income before extraordinary items, market value of equity, total assets, market-to-book ratio, leverage, Altman's Z-score, and expected default frequency (EDF).[38] My final sample consists of 3,018 firm-year observations from 2007 to 2009, with 966 observations in 2007, 1,118 observations in 2008, and 934 observations in 2009.

3.2. Variable definitions

3.2.1. CEO inside debt and relative leverage measure

Jensen and Meckling (1976) illustrate that whether managers have incentives to transfer wealth from debtholders to shareholders is determined by their relative ownership position in debt and equity. This insight is also borne out by theories developed by Edmans and Liu (2011). More specifically, when managers hold an equal percentage of both claims, they have no incentive to transfer wealth from debtholders to shareholders or vice versa. For example, if a CEO holds 10% of her company's equity and 10% of her company's debt, then each dollar of wealth transfer from debtholders to shareholders will result in 10 cents increase in the value of her equity ownership and 10 cents decline in the value of her debt ownership, leaving her overall wealth unchanged. More formally, if I use D_i and E_i to denote the market values of the CEO's debt and equity ownership and

[38] The EDF is a default probability measures based on Merton's (1974) distance to default model and I obtain each firm's EDF using the program provided by Bharath and Shumway (2008).

D_f and E_f to denote the market values of her firm's total debt and equity, the CEO will have no incentive to engage in wealth transfer if $\frac{D_i}{D_f} = \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} = \frac{D_f}{E_f}$.

On the other hand, if $\frac{D_i}{D_f} < \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} < \frac{D_f}{E_f}$, the CEO will be tempted to engage in debtholder expropriation on behalf of shareholders. When $\frac{D_i}{D_f} > \frac{E_i}{E_f}$, or equivalently, $\frac{D_i}{E_i} > \frac{D_f}{E_f}$, the CEO's incentives will become more aligned with debtholders and lead her to take actions to transfer wealth from shareholders to debtholders.

To capture the above dynamics in CEO incentives from her debt and equity holdings, I construct a measure, *CEO relative leverage*, that is equal to her personal leverage or debt-equity ratio (D_i/E_i) divided by her company's leverage or debt-equity ratio (D_f/E_f). The CEO's debt-equity ratio is equal to the value of her inside debt position divided by the value of her equity holdings, where the former equals the CEO's accumulated deferred compensation plus the present value of her pension benefits as reported by the company, and the latter equals to the market value of her stock (including restricted stock and synthetic or performance shares) and stock option ownership. I compute the market value of stock ownership by multiplying the number of shares held by the fiscal year-end stock price, and compute the market value of stock options by applying the Black-Scholes (1973) formula to each individual tranche of options held by the CEO and then adding up the tranche values.[39] I measure firm leverage by the book value of long-term and short-term debt divided by the market value of equity.[40]

[39] In applying the Black-Scholes formula to value executive stock options, I set the time-to-maturity of each tranche of options to either its full value or 70% of that to account for the early-exercising tendency of executives. Empirical results are not sensitive to this variation. Results presented in the paper are based on the full time to maturity of options.

[40] Following Wei and Yermack (2011), I also use an alternative construct of CEO relative leverage that is equal

CEO relative leverage is an inverse measure of a CEO's incentives to engage in asset substitution to expropriate debtholders. CEOs with a relative leverage less than one tend to transfer wealth from debtholders to shareholders, and the reverse is true for CEOs with a relative leverage above one. CEOs with a relative leverage equal to one are indifferent to wealth transfers between debtholders and shareholders in either direction. Since CEO relative leverage has a highly skewed distribution due to its propensity to have outliers, I take its logarithmic transformation to reduce the right-skewness in the original data. As an alternative, I construct a dummy variable, *high relative leverage*, that is equal to one if CEO relative leverage is above one or zero otherwise. This binary variable is robust to the influence of outliers, and it can also capture any nonlinearity in the relation between CEO relative leverage and bank loan contracting.

3.2.2. Conservatism measure

Following prior studies such as LaFond and Roychowdhury (2008), Nikolaev (2010), and Ma and Martin (2010), I use the asymmetric timely loss recognition estimated from the Basu (1997) model as my main measure of accounting conservatism. A parsimonious version of the Basu model is specified as follows.

$$E_t / P_{t-1} = \beta_0 + \beta_1 \mathrm{Re}t_t + \beta_2 Neg_t + \beta_3 \mathrm{Re}t_t * Neg_t + \varepsilon \qquad (1)$$

In the model, E_t/P_{t-1} is the earnings before extraordinary items for a fiscal year scaled by the market value of equity at the beginning of the fiscal year, *Ret* is the buy-and-hold return over the fiscal year (LaFond and Roychowdhury (2008) and Nikolaev (2010)),[41] and *Neg* is an indicator variable equal to one if *Ret* is negative and zero otherwise. The coefficient β_1 represents the

---

to $\frac{D_t / D_f}{\Delta E_t / \Delta E_f}$, where the denominator is the dollar change in the value of a CEO's stock and option portfolio per $1 increase in firm equity value. The correlation between my current measure and this alternative measure is 0.855. All the results hold with this alternative measure.

[41] Empirical results are robust to measuring the buy-and-hold returns over a 12-month period from nine months prior to the end of a fiscal year to three months after the fiscal year end.

timeliness of earnings with respect to good news (gains), while the coefficient β_3 captures the incremental timeliness of earnings with respect to bad news (losses). If conservatism is defined as the tendency to require a higher degree of verification to recognize good news as gains than to recognize bad news as losses, losses should be recognized in a timelier fashion than gains (Basu (1997). Therefore, the coefficient β_3 measures the asymmetric timeliness in loss recognition and reflects the degree of conditional conservatism.

3.2.3. Control variables

I augment the Basu model by controlling for firm characteristics and managerial compensation incentives that either have been shown or are potentially related to accounting conservatism. Firm characteristics include firm size, leverage, market-to-book ratio, litigation risk, and EDF. I measure firm size (*Size*) by the natural logarithm of the book value of total assets. Firm leverage (*Lev*) is equal to the book value of total debt divided by the book value of total assets.[42] A firm's market-to-book ratio (*MB*) is equal to its market value of assets over its book value of assets. I proxy for a firm's litigation risk (*Lit*) by a dummy variable that is equal to one if the firm operates in a high litigation risk industry as identified by SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370. A firm's *EDF* captures its financial distress risk and thus the potential for debtholder expropriation. For managerial incentive measures, I control for both a CEO's wealth sensitivity to stock price (*delta*) and her wealth sensitivity to stock return volatility (*vega*). These variables are to capture the findings of higher accounting conservatism in the presence of a greater separation of ownership and control (LaFond and Roychowdhury (2008)) and more managerial risk-taking incentives (Ma and Martin (2010)).[43] I take the logarithmic transformation of both variables to

[42] Empirical results are robust to measuring firm size by the market value of equity or market value of assets calculated as book value of assets minus book value of equity plus market value of equity.

[43] Given that CEO relative leverage is constructed as CEO percentage ownership of debt divided by CEO percentage ownership of equity, it is important to ensure that my findings are robust to controlling for CEO stock ownership, since LaFond and Roychowdhury (2008) find that it is negatively related to accounting conservatism. In untabulated results, I estimate an augmented Basu mode that controls for CEO stock

reduce the skewness in the original data. I also control for the percentage of salary in total CEO compensation (*salarypct*), since salary represents a relatively fixed element in executive compensation and as such can make a CEO take less risk. As a result, debtholders may demand less accounting conservatism. One the other hand, a higher percentage of cash-based pay translates into a lower percentage of equity-based pay, suggesting more agency problems between managers and shareholders. Therefore, shareholders may demand a higher level of conservatism (LaFond and Roychowdhury (2008)). Detailed variable definitions are in the Appendix. All variables are all measured at the beginning of a fiscal year.

3.3. Summary statistics

Panel A of Table 1 presents the summary statistics of the variables used in my analysis and Panel B presents their Person and Spearman correlations. I winsorize all continuous variables at the 1st and 99th percentiles to reduce the influence of outliers. The average (median) CEO in my sample has \$5.785 (1.377) million in deferred compensation and pension benefits and \$95.397 (\$17.317) million in stock and stock option holdings.[44] The CEO personal leverage is low with a mean of 0.313 and a median of 0.070. However, once I take into account firm leverage to capture a CEO's incentive to expropriate debtholders, I find that CEO relative leverage is much higher with a mean of 0.731 and a median of 0.213. Moreover, in 23.8% of the observations in my sample, CEO relative leverage is above one, indicating that in these observations CEOs actually have incentives to transfer wealth from shareholders to debtholders. The average (median) firm in my sample has a book value of total

---

ownership (*Stkpct*) both in its original level format and as a rank measure based on its level. Consistent with LaFond and Roychowdhury, I find that CEO stock ownership is negatively related to asymmetric timely loss recognition, but the effect is not statistically significant. More importantly, CEO relative leverage continues to have a significantly negative effect on asymmetric timely loss recognition. In the paper, I report the results based on controlling for *delta* and *vega*, because together they represent more comprehensive measures of CEO incentives from equity (both stock and options) ownership.

[44] In 824 of the 3,018 observations in my sample, CEOs have zero inside debt according to the information provided by ExecuComp. I examine the proxy statements of these firms and find that they either claim to not provide any pension or deferred compensation to their executives or do not mention pension or deferred compensation at all. Since it is difficult to ascertain whether CEOs actually have inside debt for companies that fall into the second category, I delete observations with zero inside debt as a robustness check and find that the results presented in the paper continue to hold.

assets of $16.722 (3.385) billion, a leverage ratio of 0.268 (0.245), and a market-to-book ratio of 1.634 (1.369). Over 16% of the firm-year observations are from high litigation risk industries. The average (median) firm in my sample has an EDF of 7.4% (0).[45] I also follow the methodology of Core and Guay (2002) to estimate each CEO's wealth sensitivity to stock price (*delta*) and stock return volatility (*vega*) from her stock and stock option ownership. The CEO at the average (median) firm has a *delta* of $1,086,240 (237,828) and a *vega* of $159,518 (69,804). The mean (median) percentage of salary in total CEO compensation is 24.9% (19.4%).

4. Empirical results

4.1. Baseline analysis of the effect of CEO inside debt on accounting conservatism

In this section I examine the impact of CEO relative leverage on accounting conservatism by estimating an augmented Basu (1997) model specified as follows.

$$\begin{aligned}
E_t / P_{t-1} = {} & \beta_0 + \beta_1 \mathrm{Ret}_t + \beta_2 Neg_t + \beta_3 \mathrm{Ret}_t * Neg_t \\
& + \beta_4 Id_{t-1} + \beta_5 \mathrm{Ret}_t * Id_{t-1} + \beta_6 Neg_t * Id_{t-1} + \beta_7 \mathrm{Ret}_t * Neg_t * Id_{t-1} \\
& + \beta_8 Vega_{t-1} + \beta_9 \mathrm{Ret}_t * Vega_{t-1} + \beta_{10} Neg_t * Vega_{t-1} + \beta_{11} \mathrm{Ret}_t * Neg_t * Vega_{t-1} \\
& + \beta_{12} Delta_{t-1} + \beta_{13} \mathrm{Ret}_t * Delta_{t-1} + \beta_{14} Neg_t * Delta_{t-1} + \beta_{15} \mathrm{Ret}_t * Neg_t * Delta_{t-1} \\
& + \beta_{16} Salarypct_{t-1} + \beta_{17} \mathrm{Ret}_t * Salarypct_{t-1} + \beta_{18} Neg_t * Salarypct_{t-1} + \beta_{19} \mathrm{Ret}_t * Neg_t * Salarypct_{t-1} \\
& + \beta_{20} EDF_{t-1} + \beta_{21} \mathrm{Ret}_t * EDF_{t-1} + \beta_{22} Neg_t * EDF_{t-1} + \beta_{23} \mathrm{Ret}_t * Neg_t * EDF_{t-1} \\
& + \beta_{24} Size_{t-1} + \beta_{25} \mathrm{Ret}_t * Size_{t-1} + \beta_{26} Neg_t * Size_{t-1} + \beta_{27} \mathrm{Ret}_t * Neg_t * Size_{t-1} \\
& + \beta_{28} Lev_{t-1} + \beta_{29} \mathrm{Ret}_t * Lev_{t-1} + \beta_{30} Neg_t * Lev_{t-1} + \beta_{31} \mathrm{Ret}_t * Neg_t * Lev_{t-1} \\
& + \beta_{32} MB_{t-1} + \beta_{33} \mathrm{Ret}_t * MB_{t-1} + \beta_{34} Neg_t * MB_{t-1} + \beta_{35} \mathrm{Ret}_t * Neg_t * MB_{t-1} \\
& + \beta_{36} Lit_{t-1} + \beta_{37} \mathrm{Ret}_t * Lit_{t-1} + \beta_{38} Neg_t * Lit_{t-1} + \beta_{39} \mathrm{Ret}_t * Neg_t * Lit_{t-1} + \varepsilon
\end{aligned} \tag{2}$$

In this model, the main variable of interest is Id_{t-1}, which captures a CEO's incentive from her inside debt and equity holdings. I use both the continuous measure, *CEO relative leverage*, and the dichotomous measure, *high relative leverage*. In addition to controlling for firm-specific

[45] To be exact, the median EDF is 3.60×10^{-10}. As a point of reference, the median EDF of firms with S&P credit ratings of BB+, BB, and BB-, which are just below the investment grade, is 1.95×10^{-12}. The median and mean EDF of my sample are very similar to those reported by Bharath and Shumway (2008).

characteristics, I also include fiscal year and industry (defined based on two-digit SIC codes) fixed-effects in the regression model. As explained earlier, β_3 measures the asymmetric timeliness of bad news (losses) being reflected in earnings relative to good news (gains). The coefficients β_7, β_{11}, β_{15}, β_{19}, β_{23}, β_{27}, β_{31}, β_{35} and β_{39} capture the effects of *CEO relative leverage*, *vega*, *delta*, *salarypct*, *EDF*, *Size*, *Lev*, *MB*, and *Lit* on the asymmetric timeliness in loss recognition. Based on my hypothesis that managerial ownership of debt reduces debtholder demand for conservatism, I expect the coefficient β_7 to be significantly negative.

Table 2 presents the regression results. Figures in the parentheses below coefficient estimates are robust *t*-statistics based on standard errors adjusted for heteroskedasticity (White (1980)) and firm-level clustering (Peterson (2009)). Next to some of the explanatory variables are the predicted signs of the coefficients on these variables. In column (1), I replicate a parsimonious Basu (1997) model that does not include any managerial compensation incentive variables and only controls for the effects of *Size*, *Lev*, *MB* and *Lit* on the asymmetric timely loss recognition. Consistent with Basu (1997), β_3 is significantly positive, suggesting that losses are recognized more timely than gains. I next add *CEO relative leverage*, *vega*, *delta* and *salarypct* to the Basu model, with the specification in column (2) using the continuous measure of CEO relative leverage and the specification in column (3) using the dichotomous measure. I find that β_7 is equal to -0.279 and statistically significant at the 1% level in column (2), and it is equal to -0.208 and statistically significant at the 5% level in column (3). These results suggest that ceteris paribus, firms with higher CEO relative leverage display significantly less asymmetric timeliness in loss recognition and are consistent with my first hypothesis that managerial ownership of debt reduces debtholder demand for accounting conservatism. In columns (4) and (5), I estimate the fully augmented Basu model (equation (2)) by controlling for *EDF* and its related interaction terms. I find that β_7 remains negative and statistically significant, even though its magnitude becomes smaller than in columns (2) and (3).[46]

[46] Empirical results indicate that EDF has a significantly positive effect on asymmetric timely loss recognition, consistent with debtholders demanding greater accounting conservatism at firms with higher default

The effect of CEO relative leverage on conservatism appears to be economically significant as well. I use coefficient estimates in columns (4) and (5) to obtain the most conservative assessment. Based on the coefficients on *Ret*Neg* (β_3) and *Log(1+Ret*Neg*Relative leverage)*(β_7) in column (4), one standard deviation increase in *CEO relative leverage* (0.491) reduces the degree of asymmetric timely loss recognition by about 21% (=0.491×0.279/0.655). In column (5), the coefficients on *Ret*Neg* (β_3) and *Ret*Neg*High relative leverage* (β_7) suggest that the degree of asymmetric timely loss recognition is about 29% (=0.162/0.568) lower for firms with *CEO relative leverage* above one than for firms with *CEO relative leverage* below one. The economic significance of my findings is comparable to that of other determinants of conservatism documented in the literature (see, e.g., LaFond and Roychowdhury (2008) and Ma and Martin (2010)).

With respect to other managerial incentive variables, we can find that asymmetric timely loss recognition is: (i) positively related to *vega* (significant in columns (4) and (5) only), consistent with Ma and Martin (2010); (ii) significantly negatively related to *delta*, consistent with a greater pay-for-performance sensitivity aligning the interests of managers and shareholders and reducing shareholder demand for conservatism (LaFond and Roychowdhury (2008)); and (iii) positively related to the percentage of salary in total compensation (significant in columns (2) and (3) only), consistent with performance-insensitive pay creating or reflecting more agency problems between managers and shareholders and leading to greater demand for accounting conservatism by shareholders.

4.2. Expected agency costs of debt and the effect of CEO inside debt on conservatism

Theory suggests that inside debt plays a more important role in counteracting managerial risk-taking incentives and alleviating debtholder concerns about expropriation when debtholders face higher expropriation risk (Edmans and Liu (2011)). As a result, I expect the negative effect of CEO relative leverage on debtholder demands for conservatism to be more pronounced under these

---

probabilities and distress risk. This positive effect, coupled with the negative correlation between EDF and CEO relative leverage (see Panel B of Table 1), can explain why the coefficient on the interaction term between CEO relative leverage and Ret*Neg becomes smaller.

conditions. I construct a number of proxies for the vulnerability of debtholders to expropriation: default probability (EDF), Altman's Z-score, growth options, and CEO horizon problems. Firms with a higher EDF or lower Z-score are at greater risk to fall into financial distress and bankruptcy, providing shareholders with more incentives to act opportunistically against debtholders. Firms with more growth options have more opportunities to pursue risky investments, making creditor monitoring more difficult, and their assets tend to be intangible and have lower liquidation values. Younger CEOs have greater career concerns and more future earnings to lose if their firms fall into financial distress or bankruptcy. As a result, they are less likely to take excessive risk to expropriate debtholders. Therefore, I expect older CEOs to present greater horizon problems and expropriation risk to debtholders.

4.2.1. Default probability

I partition my sample into two subsamples based on whether a firm's EDF at the beginning of a fiscal year is above or below the sample median. I then estimate equation (2) on the two subsamples separately. Columns (1) and (2) in Panel A of Table 3 present the subsample regression results that are based on the continuous *CEO relative leverage*. We can find that the coefficient on *Log(1+Ret*Neg*CEO relative leverage)* is significantly negative (-0.333, *t-stat*: 2.57) for the high-EDF subsample and is negative but insignificant (-0.010, *t-stat*: 0.19) for the low-EDF subsample. The difference in the coefficient between the two subsamples is statistically different at the 1% level.

Similar results emerge when I replace the continuous *CEO relative leverage* with the dichotomous *high relative leverage* in columns (3) and (4). The coefficient on *Ret*Neg*High relative leverage* is both larger in magnitude and statistically more significant for the high-EDF subsample (-0.275, *t-stat*: 2.05) than for the low-default risk subsample (-0.006, *t-stat*: 0.12). In terms of the economic significance of empirical results, for the high-EDF subsample, the degree of asymmetric timely loss recognition declines by about 66% (=0.275/0.416) when CEO relative leverage increases from below one to above one. Compared to the full sample (see Table 2), the

demand from debtholders for conservatism is more sensitive to CEO inside debt holdings at firms with higher default risk.

Overall, my findings in this section support my second hypothesis that the negative relation between accounting conservatism and managerial ownership of debt is more pronounced at firms with higher expropriation risk for debtholders.

4.2.2. Altman's Z-score

As an alternative to EDF, I use Altman's Z-score to capture a firm's default risk and the incentives of shareholders to engage in risk-shifting activities to expropriate debtholders. I partition my sample into high-default risk and low-default risk subsamples based on whether a firm's Z-score at the beginning of a fiscal year is above or below 1.81, and estimate equation (2) on the subsamples separately. I expect inside debt to have a greater impact on conservatism in the high-default risk subsample. Results presented in Table 4 are consistent with my conjecture. Specifically, the coefficient on the interaction between *Ret*Neg* and CEO inside debt measures is negative and statistically significant only in the high-default risk subsample, regardless of whether I use the continuous or dichotomous CEO relative leverage measure (see columns (2) and (4)).

4.2.3. Growth options

Firms with more growth options have a larger investment opportunity set. Since debtholders do not have complete information on all the investment projects firms can choose from, a larger investment opportunity set makes it more difficult for debtholders to observe and monitor firms' investment decisions and increases the expropriation risk faced by debtholders. In addition, firms with more growth options tend to have more intangible assets, which have lower recovery values in default and therefore are associated with higher agency costs of debt. I use a firm's R&D expenses to sales ratio to capture its growth opportunities, and expect the relation between CEO inside debt and conservatism to be stronger for firms with higher R&D/Sales ratios. I partition my sample into two

subsamples based on whether a firm's R&D/Sales ratio at the beginning of a fiscal year is greater than zero and estimate equation (2) separately on the subsamples.

Results presented in Table 5 support my second hypothesis. As shown in columns (1) and (2), the coefficient on *Log(1+Ret*Neg*CEO relative leverage)* is negative in both subsamples, but it is only significant in the positive-R&D subsample. Moreover, the magnitude of the coefficient is significantly larger for the positive-R&D subsample than for the zero-R&D subsample with a *p*-value of less than 1%. The results are very similar when I use *high relative leverage* in columns (3) and (4). Taken together, these results suggest that the negative relation between CEO inside debt and conservatism is concentrated in firms with more growth options where managers have more opportunities to engage in asset substitution activities.

4.2.4. CEO horizon problems

The career concerns of CEOs may help reduce agency costs of debt. Younger CEOs have more to lose in terms of future earnings if their firms fall into financial distress or bankruptcy. Therefore, they have less incentive to take excessive risk to expropriate debtholders to benefit shareholders. This is consistent with theory (Holmstrom (1982)) and evidence (Chevalier and Ellison (1999), Hong, Kubik, and Solomon (2000) and Lamont (2002)) suggesting that career concerns could lead younger managers to herd and avoid risk taking that may result in negative performance outcomes and jeopardize their careers.[47] As such, I expect older CEOs who are close to retirement to present greater horizon problems and expropriation risk to debtholders and the effect of inside debt on accounting conservatism to be stronger among them.

To test this conjecture, I partition my sample into two subsamples based on whether a firm's CEO is less than 60 years old at the beginning of a fiscal year.[48] I estimate subsample regressions of the augmented Basu model specified in equation (2) and present the results in Table 6, where

[47] Specifically, Chevalier and Ellison (1999) study mutual fund managers, Hong et al. (2000) examine security analysts, and Lamont (2002) look at economists making macroeconomic forecasts.
[48] Anecdotal evidence suggests that CEOs start to voluntarily step down at the age of 60.

columns (1) and (2) are based on the continuous CEO relative leverage measure while columns (3) and (4) based on the dichotomous measure. We can find that the coefficient estimate of the interaction between *Ret*Neg* and CEO relative leverage measures is negative in both subsamples, but only significantly so in the older-CEO subsample. The magnitude of the coefficient is also significantly larger in the older-CEO subsample with a *p*-value of less than 1%. These results are consistent with my conjecture and suggest that inside debt plays a more important role in reducing agency costs of debt at firms run by older CEOs and thus has a larger impact on debtholder demand for accounting conservatism.

4.3. Credible commitment to conservative financial reporting

In this section I test my third hypothesis that debtholder demand for accounting conservatism is more sensitive to CEO inside debt when firms can more credibly commit to a conservative financial reporting policy desired by debtholders. Given the repeated nature of borrowing, I expect that firms have more incentives to fulfill their commitment to creditor preference for accounting conservatism when they are more reliant on debt capital, when they tend to borrow short term and thus need to access the debt market more frequently, and when they have borrowed repeatedly from a particular lender in the past.

4.3.1. Reliance on debt capital

I measure a firm's reliance on debt capital by its leverage ratio, which captures the fraction of debt in the firm's capital structure. I partition my sample based on whether a firm's leverage at the beginning of a fiscal year is above or below the sample median. I then estimate equation (2) on the two subsamples separately. Columns (1) and (2) in Table 7 present the subsample regression results, where CEO inside debt position is measured by *CEO relative leverage*. I find that the coefficient on *Log(1+Ret*Neg*CEO relative leverage)* is significantly negative (-0.230, *t-stat*: 4.85) for the high-leverage subsample and is negative but insignificant (-0.038, *t-stat*: 1.08) for the low-leverage

subsample. The difference in the coefficient between the two subsamples is statistically different at the 1% level. Similar results emerge when I replace *CEO relative leverage* with *high relative leverage* in columns (3) and (4). These findings suggest that the negative relation between accounting conservatism and managerial ownership of debt is more pronounced at firms that rely more heavily on debt capital, lending support to my third hypothesis.[49]

4.3.2. Reliance on short-term borrowing

I measure a firm's reliance on short-term borrowing by the maturity structure of its debt. More specifically, I compute the percentage of a firm's total debt that is due within three years (*pct3years*). Firms with a higher *pct3years* need to access the debt market more often and thus can more credibly commit to debtholder demand for conservatism. I create two subsamples based on whether a firm's *pct3years* at the beginning of a year is above or below the sample median, and estimate the augmented Basu model in equation (2) in the two subsamples separately. Results in Table 8 indicate that consistent with the prediction of my third hypothesis, the asymmetric timely loss recognition is significantly negatively related to CEO relative leverage measures only in the high-*pct3years* subsample, and the between-subsample difference is significant at the 1% level.

4.3.3. Repeated borrower-lender relationship

I identify the existence of a repeated borrower-lender relationship by examining whether a firm has borrowed from the same bank at least twice over the past ten years.[50] Firms in a repeated relationship with a lender can more credibly commit to creditor demand for conservatism, since reneging on their commitment could cost them the established banking relationship and cause

[49] Leverage can also be interpreted as a proxy for bankruptcy risk and potential expropriation of debtholders by shareholders, even though it is not necessarily true that more levered firms are closer to financial distress and represent higher expropriation risk to debtholders since it is usually larger, more stable companies with more tangible assets that have higher leverage (see, e.g., Rajan and Zingales (1995)).

[50] Results are similar if I define a repeated banking relationship based on a minimum of three prior instances of borrowing. This measure is constructed based on the data from DealScan.

reputational damage that limits their ability to secure funding from other lenders.

I partition my sample based on the existence of a repeated banking relationship and estimate equation (2) in the subsamples. Results in Table 9 show that the coefficient on *Log(1+Ret*Neg*CEO relative leverage)* is significantly negative in the repeated-borrowing subsample only, and its magnitude is also significantly larger in this subsample than in the other subsample with a *p*-value of less than 1% (columns (1) and (2)). Columns (3) and (4) are based on the dichotomous CEO relative leverage measure and yield essentially the same results.

Overall, the evidence in this section is consistent with my third hypothesis that the negative relation between managerial ownership of debt and accounting conservatism is more pronounced when firms can be expected to commit to a high level of conservatism. This provides support to the credible commitment assumption underlying my main hypothesis.

4.4. Alternative measures of accounting conservatism

In light of recent controversies over the Basu (1997) model (Givoly, Hayn and Natarajan (2007) and Dietrich, Muller and Riedl (2007)), I employ several alternative measures of accounting conservatism to ensure the robustness of my findings.

Ball and Shivakumar (2006) argue that to the extent that changes in the present value of expected future cash flows are accrued as a component of current earnings, accruals are positively correlated with cash flows and revisions of cash flows. Since economic losses are more likely to be recognized in a timely fashion while gains are more likely to be recognized when realized, the positive correlation between accruals and cash flows or revisions of cash flows is greater in the case of losses. Therefore, Ball and Shivakumar propose a model of accruals in relation to cash flows or revisions of cash flows and use the asymmetry in the responsiveness of accruals to cash flows or revisions of cash flows as a measure of conservatism in the absence of stock returns. Since very few firms in my sample have negative cash flows, I use cash flow changes as a proxy for economic news with positive (negative) cash flows changes representing good (bad) news. I estimate the augmented

Ball and Shivakumar (2006) model specified in equation (3).

$$
\begin{aligned}
ACC_t = {} & \beta_0 + \beta_1 \Delta CF_t + \beta_2 Neg_t + \beta_3 \Delta CF_t * Neg_t \\
& + \beta_4 Id_{t-1} + \beta_5 \Delta CF_t * Id_{t-1} + \beta_6 Neg_t * Id_{t-1} + \beta_7 \Delta CF_t * Neg_t * Id_{t-1} \\
& + \beta_8 Vega_{t-1} + \beta_9 \Delta CF_t * Vega_{t-1} + \beta_{10} Neg_t * Vega_{t-1} + \beta_{11} \Delta CF_t * Neg_t * Vega_{t-1} \\
& + \beta_{12} Delta_{t-1} + \beta_{13} \Delta CF_t * Delta_{t-1} + \beta_{14} Neg_t * Delta_{t-1} + \beta_{15} \Delta CF_t * Neg_t * Delta_{t-1} \\
& + \beta_{16} Salarypct_{t-1} + \beta_{17} \Delta CF_t * Salarypct_{t-1} + \beta_{18} Neg_t * Salarypct_{t-1} + \beta_{19} \Delta CF_t * Neg_t * Salarypct_{t-1} \\
& + \beta_{20} EDF_{t-1} + \beta_{21} \Delta CF_t * EDF_{t-1} + \beta_{22} Neg_t * EDF_{t-1} + \beta_{23} \Delta CF_t * Neg_t * EDF_{t-1} \\
& + \beta_{24} Size_{t-1} + \beta_{25} \Delta CF_t * Size_{t-1} + \beta_{26} Neg_t * Size_{t-1} + \beta_{27} \Delta CF_t * Neg_t * Size_{t-1} \\
& + \beta_{28} Lev_{t-1} + \beta_{29} \Delta CF_t * Lev_{t-1} + \beta_{30} Neg_t * Lev_{t-1} + \beta_{31} \Delta CF_t * Neg_t * Lev_{t-1} \\
& + \beta_{32} MB_{t-1} + \beta_{33} \Delta CF_t * MB_{t-1} + \beta_{34} Neg_t * MB_{t-1} + \beta_{35} \Delta CF_t * Neg_t * MB_{t-1} \\
& + \beta_{36} Lit_{t-1} + \beta_{37} \Delta CF_t * Lit_{t-1} + \beta_{38} Neg_t * Lit_{t-1} + \beta_{39} \Delta CF_t * Neg_t * Lit_{t-1} + \varepsilon
\end{aligned}
\tag{3}
$$

ACC is total accruals estimated as earnings before extraordinary items minus cash flows from operations scaled by total assets, $\triangle CF$ is the change in annual cash flows from operations scaled by total assets, and Neg is a dummy variable equal to one if $\triangle CF$ is negative.[51] Other variables are defined as earlier. The coefficient β_3 is the Ball and Shivakumar (2006) measure of accounting conservatism, and the coefficient β_7 captures the effect on accounting conservatism of CEO inside debt positions. The regression results presented in Table 10 show that β_7 is significantly negative, regardless of which measure of CEO relative leverage I use. Therefore, my findings are robust to using the Ball and Shivakumar measure of conservatism.

In further analysis, I also try to capture accounting conservatism by (i) the firm-year conservatism measure, *C_SCORE*, developed by Khan and Watts (2009), (ii) the amount of negative non-operating accruals (*NOA*) as in Givoly and Hayn (2000) and Ahmed and Duellman (2007), (iii) the difference between skewness in cash flows and earnings (*SKEW*) as in Givoly and Hayn (2000) and Beatty, Webber and Yu (2008), and (iv) a composite rank based on the three metrics. For each firm-year observation in my sample, *C_SCORE* is estimated strictly following Khan and Watts's methodology, *NOA* is equal to the average non-operating accruals over the previous three years multiplied by negative one, and *SKEW* is measured using quarterly data over the previous six years

[51] I lose 4 observations due to additional data requirements for estimating total accruals and cash flow changes.

with a minimum of 5 quarters.[52] Based on each of the three metrics, I assign my sample firms into deciles created annually, with the bottom decile (rank=1) containing firms with the least conservative accounting. I then add the three decile ranks of each firm-year observation to obtain a composite rank of accounting conservatism. Detailed definitions of these variables are in the Appendix.

I estimate regressions of the four conservatism measures with CEO relative leverage as the key independent variable. I also control for firm size, leverage, market-to-book ratio, litigation risk, EDF, delta, vega, and the percentage of salary in CEO total compensation as other potential determinants of accounting conservatism. Table 11 presents the results, with those in Panel A based on the continuous measure of CEO relative leverage and those in Panel B based on the dichotomous measure. I find that the coefficients on both measures of CEO relative leverage are significantly negative in all four models. Therefore, my finding that CEO inside debt holdings reduce debtholder demand for accounting conservatism does not appear to be driven by any particular measure of conservatism.

In addition, untabulated results show that the negative relation between CEO relative leverage and accounting conservatism continues to be concentrated in firms where debtholders face higher expropriation risk, even when I replace the Basu (1997) measure with the alternative measures introduced in this section. This lends further support to my second hypothesis.

4.5. Endogeneity of CEO inside debt

So far the empirical results indicate that firms with higher CEO relative leverage display less accounting conservatism. One interpretation of this finding is that inside debt aligns the incentives of managers with those of debtholders and thus reduces debtholders' concern about expropriation and their demand for accounting conservatism. However, the endogenous nature of CEO inside debt and accounting conservatism suggests alternative interpretations. It is possible that some uncontrolled firm characteristics, e.g., expected agency costs of debt, could drive both CEO inside debt positions

[52] Additional data requirements reduce my sample size to 2,987.

and accounting conservatism.

While endogeneity-based explanations are plausible, I do not believe they can account for the main results. From a conceptual standpoint, any endogeneity-based interpretations need to be able to explain not only the negative relation between accounting conservatism and inside debt, but also the cross-sectional variations in the relation along the dimension of expected agency costs of debt. In particular, these cross-sectional variations suggest that the negative effect of CEO relative leverage on accounting conservatism is more pronounced in firms that expose creditors to greater credit risk and shareholder expropriation, which is consistent with CEO inside debt playing a more valuable role in alleviating the shareholder-debtholder conflict in these firms. However, endogeneity-based interpretations offer no such prediction.

In addition to the above arguments, I address the endogeneity problem using a two-stage least squares (2SLS) approach that endogenizes CEO relative leverage. I select two instrument variables (IVs) for CEO relative leverage. One is the top personal income tax rate for the state where a firm is headquartered, and the other is a Gibbs estimate of a firm's effective equity trading costs developed by Hasbrouck (2009).[53] I expect the state personal income tax rate to be positively related to CEO relative leverage, as higher tax rates may induce CEOs to defer more of their current compensation. The equity trading cost measure is likely to be negatively related to CEO relative leverage, since higher transaction costs may discourage CEOs from dispensing the shares they receive either as direct compensation or as a result of exercising options. Neither the state personal income tax rate nor a firm's equity trading cost suggests a direct and theoretically sensible linkage with accounting conservatism. I later verify the exogeneity of my instruments via an over-identification test.

Applying the 2SLS approach to the augmented Basu (1997) model is econometrically difficult because the endogenous variable, CEO relative leverage, appears not only as a standalone

[53] I thank Joel Hasbrouck for generously sharing his Gibbs estimates of trading costs on his website (http://pages.stern.nyu.edu/~jhasbrou/Research/GibbsCurrent/gibbsCurrentIndex.html).

explanatory variable but also as a part of three interaction terms. Therefore, I use the firm-year conservatism measure, *C_SCORE*, developed by Khan and Watts (2009) as an alternative to the asymmetric timeliness coefficient in the Basu (1997) model. I estimate a 2SLS regression of *C_SCORE* against CEO relative leverage, which I instrument in the first stage using the two IVs introduced above. In both stages, I control for firm size, leverage, market-to-book ratio, litigation risk, EDF, vega, delta, and the percentage of salary in total CEO compensation, since these variables have been shown to be related to accounting conservatism. I present the estimation results in Table 12, where I use the continuous CEO relative leverage measure in Panel A and the dichotomous measure in Panel B. In both panels, the first-stage regressions show that the state personal income tax rate has a significant and positive effect on CEO relative leverage, while the Gibbs estimate of equity trading costs has a significant and negative effect, both consistent with my conjectures. In Panel A, the adjusted partial R-squared attributed to the two instruments is 1.36%, which is statistically significant with a *p*-value of less than 0.0001. These results suggest that my instruments satisfy the relevance condition. Having two instruments and only one endogenous variable allows us to run an over-identification test, which produces a Hansen's *J* statistic that is indistinguishable from zero (*p*-value: 0.25). This suggests that my instruments also satisfy the exogeneity condition. In the second-stage regressions, I find that the instrumented CEO relative leverage measure (continuous or dichotomous) has a significant and negative effect on *C_SCORE*, providing further support for my hypothesis that managerial inside debt holdings reduce debtholder demand for accounting conservatism.

I also repeat the 2SLS regressions for unconditional conservatism measures such as the amount of negative non-operating accruals (*NOA*) and the difference between skewness in cash flows and earnings (*SKEW*) and the composite rank of conservatism based on *C_SCORE*, *NOA*, and *SKEW*. I continue to find significant evidence that financial reporting is less conservative when CEO relative leverage is higher (see Table 12). Together, the evidence from 2SLS regressions indicates that my findings are robust to correcting for endogeneity.

In addition to the 2SLS regressions, I implement two other tests to further alleviate the endogeneity concern. First, I estimate a regression that relates changes in conservatism to changes in CEO relative leverage. Compared to analysis based on levels, this change-based approach has the advantage of filtering out the influence of unobservable factors that are time-invariant. Since such a change-based analysis is infeasible to implement in the framework of Basu-type regressions where the key explanatory variable appears in interaction terms, I measure accounting conservatism by *C_SCORE*, the firm-year conservatism metric developed by Khan and Watts (2009), and regress the changes in *C_SCORE* against changes in CEO relative leverage while controlling for changes in other firm characteristics. Results presented in Table 13 show that changes in CEO relative leverage have a significant and negative effect on changes in accounting conservatism, thus lending further support to my main hypothesis.

Second, I conduct an event study similar to that in Wei and Yermack (2011). Following their approach, I focus on firms' first mandatory disclosure of inside debt information in 2007. For each firm with available data, I compute the change in its *C_SCORE* from 2006 fiscal year end to 2007 fiscal year end. I regress the *C_SCORE* change against CEO relative leverage measures constructed based on the information disclosed in the 2007 proxy statement along with other control variables.[54] Results presented in Table 14 indicate that CEO relative leverage has a significantly negative effect on the change in *C_SCORE*, providing more support for the hypothesis that debtholders reduce their demand for accounting conservatism upon observing large inside debt ownership by CEOs.[55]

4.6. Pension vs. deferred compensation

[54] Since the premise of the event study is that debtholders adjust their demand for conservatism based on what they know and observe at firms' initial disclosure of inside debt in 2007, the control variables are levels observed at the end of fiscal year 2006 rather than changes from 2006 to 2007 to avoid any look-ahead bias. Since the control variables are not changes, I do not have predictions on how they are related to changes in accounting conservatism.

[55] The change-based regression and the event study are unsuitable for unconditional conservatism measures such as *NOA* and *SKEW*, since these variables are estimated over a multiple-year period and thus are slow-moving by design. In untabulated results, I find that CEO relative leverage or its changes still has a negative effect on changes in *NOA* and *SKEW*, but the effect is not significant.

My analysis so far has treated executive pensions and deferred compensation as equivalent in computing CEO relative leverage. However, the two forms of compensation differ in at least two aspects that could impact the incentives they provide to managers. First, in contrast to pensions, which will pay benefits only when CEOs reach a mandatory age, deferred compensation can be withdrawn early, though usually with a hefty penalty (Wei and Yermack (2011)). By providing managers with an opportunity to cash out prior to performance deterioration and default events, the early withdrawal provision potentially weakens the risk-reducing incentives from deferred compensation in comparison to pensions. Second, firms sometimes allow executives' deferred compensation to be invested in their own stock (Wei and Yermack (2011)), which to some extent negates the debt-like nature of deferred compensation and again weakens the risk-reducing incentives it provides.

In light of these differences, I construct two sets of CEO relative leverage measures, one set based on pension value only and the other based on deferred compensation only. I substitute these newly constructed CEO relative leverage measures for the original ones in the augmented Basu model in equation (2) and re-estimate the regression. The coefficient estimates reported in Table 15 show that both the pension-based and deferred compensation-based relative leverage measures are negatively related to asymmetric timely loss recognition, but the relation is only statistically significant for the pension-based measure. My findings hold regardless of whether these measures are included separately (as in columns (1)-(4)) or jointly (as in columns (5) and (6)) in the model. These results suggest that consistent with my expectations, executive pensions indeed are more effective than deferred compensation in reducing managers' incentive to engage in excessive risk taking and debtholder expropriation.

5. Conclusion

In this chapter I investigate the relation between accounting conservatism and managerial

ownership of debt in the form of deferred compensation and pension benefits. Accounting conservatism arises as an important mechanism to address the agency conflicts between shareholders and debtholders and reduce agency costs of debt. Debtholders tend to demand more conservative financial reporting at firms with more serious shareholder-debtholder conflicts. Managerial ownership of debt, on the other hand, aligns managers' incentives more closely with those of debtholders and reduces managerial incentives to expropriate debtholders on shareholders' behalf. Therefore, upon observing greater managerial debt holdings, debtholders perceive lower expropriation risk and thus demand less accounting conservatism.

Consistent with this hypothesis, I find significant evidence of less conservative financial reporting at firms where CEOs have accumulated more deferred compensation and pension benefits. This negative relation is more pronounced in firms with higher default risk, more growth options, and greater CEO horizon problems, i.e., firms characterized by higher expected agency costs of debt, consistent with the view that the risk reducing incentives from inside debt are more important at these firms. I also find that debtholder demand for conservatism is more responsive to managerial debt holding among firms that can credibly commit to a higher level of conservatism if required by debtholders. These empirical results are robust to correcting for potential endogeneity of managerial ownership of debt and to using a number of alternative accounting conservatism measures.

A.3 Tables for chapter three

Appendix: Variable Definitions

Variable	Definition
CEO inside debt	Sum of CEO deferred compensation and pension value
CEO inside equity	Market value of CEO stock and stock option holdings.
CEO personal leverage	The ratio of CEO inside debt to inside equity.
CEO relative leverage	CEO personal leverage divided by firm leverage, where firm leverage is equal to the book value of long-term and short-term debt (DLTT + DLC) divided by the market value of equity (PRCC_F * CSHO).
High relative leverage	A dummy variable equal to one if CEO relative leverage is greater than one.
Vega	Dollar change in the value of a CEO's stock and option portfolio per 0.01 increase in the annualized standard deviation of stock returns.
Delta	Dollar change in the value of a CEO's stock and option portfolio per 1% increase in stock price.
Salarypct	CEO's salary scaled by total compensation.
Stkpct	CEO's percentage ownership of stock.
E/P	Earnings before extraordinary items (IB) scaled by the market value of equity at the beginning of the year (PRCC_F * CSHO).
Ret	The buy-and-hold stock returns over a fiscal year.
Neg	A dummy variable equal to one if Ret is negative.
Size	Log(book value of total assets (AT)).
Lev	Book value of total debt (DLTT + DLC) divided by book value of total assets (AT).
MB	Market value of total assets (AT - CEQ + PRCC_F * CSHO) divided by book value of total assets (AT).
LIT	A dummy variable equal to one if a firm falls in high litigation risk industry as identified by SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370.
EDF	Expected default frequency, a default probability measure based on the Merton (1974) distance to default model and estimated using the program provided by Bharath and Shumway (2008).
Z-score	Altman's Z-score computed as 3.3* OIADP/AT + 1.2*(ACT- LCT)/AT + SALE /AT + 0.6* PRCC_F * CSHO / (DLTT + DLC) + 1.4* RE/AT.
Growth options	Research and development expenditure (RDX) scaled by net sales (SALE).
Pct3years	The percentage of a firm's total debt that is due within three years.
Repeated borrowing	A dummy variable equal to one if a firm has borrowed from any bank more than once over the past ten years.
ACC	Total accruals, defined as earnings before extraordinary items (NI) minus cash flows from operations (OANCF) scaled by total assets (AT).
$\triangle CF$	Change in cash flows from operations (OANCF) scaled by total assets (AT).
C_SCORE	A firm-year measure of conservatism developed by Khan and Watts (2009).
NOA	The average non-operating accruals over the previous three years multiplied by negative one. Non-operating accruals are estimated as (NI+DP-OANCF+RECCH+INVCH+APALCH+TXACH)/AT.
SKEW	The difference between skewness in cash flows (OANCF/AT) and earnings (NI/AT) over the previous 24 quarters with a minimum of 5 quarters of data.
RANK	A composite rank measure of accounting conservatism based on NOA, SKEW, and C_SCORE.
Tax rate	Top personal income tax rate of the state where a firm is headquartered.
Gibbs estimate	Gibbs estimate of a firm's equity trading costs developed by Hasbrouck (2009).

Table 1. Summary statistics

The sample consists of 3,018 observations. Variable definitions are in the Appendix.

Panel A: Descriptive statistics							
	Mean	Stdev	P10	Q1	Median	Q3	P90
Inside debt, D_i (mil $)	5.785	12.213	0.000	0.000	1.377	6.289	15.494
Inside equity, E_i (mil $)	95.397	757.519	2.673	6.624	17.317	46.601	126.039
CEO personal leverage, D_i/E_i	0.313	1.180	0.000	0.000	0.070	0.314	0.736
CEO relative leverage	0.731	1.160	0.000	0.000	0.213	0.944	2.237
Log(1+ CEO relative leverage)	0.402	0.491	0.000	0.000	0.193	0.665	1.175
High relative leverage	0.238	0.426	0.000	0.000	0.000	0.000	1.000
E/P	-0.018	0.252	-0.183	0.005	0.048	0.070	0.098
Ret	-0.023	0.558	-0.602	-0.357	-0.096	0.200	0.541
Total assets (mil $)	16,722	51,158	504	1,140	3,385	10,505	32,815
Size	8.222	1.631	6.223	7.039	8.127	9.260	10.399
Lev	0.268	0.177	0.055	0.139	0.245	0.369	0.504
MB	1.634	0.820	0.983	1.094	1.369	1.904	2.621
Lit	0.161	0.368	0.000	0.000	0.000	0.000	1.000
EDF	0.074	0.208	0.000	0.000	0.000	0.003	0.256
CEO vega (thousand $)	159.518	295.013	6.460	22.719	69.804	183.066	393.025
CEO delta (thousand $)	1086.240	7670.402	34.321	87.600	237.828	632.864	1621.010
Salarypct	0.249	0.192	0.074	0.116	0.194	0.322	0.502
Stkpct (%)	1.279	3.176	0.035	0.105	0.300	0.875	2.693

Panel B. Pearson (top) and Spearman (bottom) correlations

	Log(1+CEO relative leverage)	High relative leverage	E/P	Ret	Neg	Log (vega)	Log (delta)	Stkpct	Salary	Size	Lev	MB	Lit	EDF
Log(1+CEO relative leverage)		0.866	0.125	0.020	-0.056	0.116	-0.007	-0.192	-0.104	0.172	-0.185	0.056	-0.060	-0.121
High relative leverage	0.745		0.098	0.012	-0.054	0.088	-0.020	-0.146	-0.079	0.103	-0.165	0.064	-0.043	-0.098
E/P	0.210	0.135		0.123	-0.137	0.157	0.239	-0.042	-0.127	0.031	-0.102	0.185	-0.002	-0.413
Ret	0.067	0.055	0.415		-0.696	-0.106	-0.167	-0.011	-0.027	-0.039	0.038	-0.093	-0.020	0.360
Neg	-0.058	-0.054	-0.321	-0.853		0.021	0.078	0.020	0.063	0.000	-0.015	0.075	0.047	-0.169
Log(vega)	0.179	0.085	0.129	-0.012	0.014		0.543	-0.090	-0.355	0.411	-0.053	0.148	0.091	-0.243
Log(delta)	0.063	-0.014	0.181	-0.068	0.067	0.639		0.389	-0.371	0.443	-0.054	0.296	0.006	-0.302
Stkpct	-0.261	-0.206	-0.066	-0.002	-0.005	-0.224	0.224		0.094	-0.106	-0.003	0.037	-0.027	0.022
Salary	-0.136	-0.074	-0.140	-0.045	0.057	-0.482	-0.432	0.210		-0.374	-0.056	-0.112	-0.005	0.071
Size	0.299	0.111	0.133	0.000	-0.008	0.486	0.444	-0.335	-0.444		0.060	-0.240	-0.133	0.089
Lev	-0.093	-0.151	-0.049	0.014	-0.028	-0.004	-0.046	0.012	-0.058	0.076		-0.045	-0.050	0.282
MB	0.035	0.103	0.178	-0.082	0.093	0.198	0.357	-0.075	-0.166	-0.235	-0.074		0.159	-0.264
Lit	-0.098	-0.043	-0.046	-0.042	0.047	0.088	0.009	-0.049	-0.017	-0.131	-0.057	0.165		-0.069
EDF	-0.0166	-0.167	-0.189	0.184	-0.198	-0.230	-0.397	0.115	0.138	0.016	0.398	-0.613	-0.095	

Table 2. The effect of CEO inside debt on conservatism

This table presents regression results of the augmented Basu (1997) model as specified in equation (2). The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (2) and (4) and *high relative leverage* in columns (3) and (5). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Ret	-0.391***	-0.307**	-0.248*	-0.129	-0.089
	(-2.95)	(-2.04)	(-1.73)	(-1.10)	(-0.77)
Neg	-0.059	-0.036	-0.018	0.079	0.093
	(-0.69)	(-0.36)	(-0.18)	(0.92)	(1.07)
Ret*Neg	0.849***	0.655**	0.607**	0.595**	0.568**
	(3.28)	(2.24)	(2.07)	(2.53)	(2.39)
Log(1+CEO Relative leverage)		0.014		0.007	
		(0.68)		(0.33)	
Ret* Log(1+ CEO relative leverage)		0.032		0.023	
		(0.52)		(0.38)	
Neg* Log(1+ CEO relative leverage)		-0.035		-0.017	
		(-1.35)		(-0.69)	
Ret*Neg* Log(1+CEO Relative leverage)		***-0.279*****		***-0.199****	
		(-3.40)		***(-2.57)***	
High relative leverage			0.028		0.018
			(1.21)		(0.78)
Ret* High relative leverage			-0.048		-0.028
			(-0.60)		(-0.37)
Neg* High relative leverage			-0.054**		-0.033
			(-1.98)		(-1.25)
Ret*Neg* High relative leverage			***-0.208****		***-0.162****
			(-2.18)		***(-1.77)***
Log(Vega)		0.020*	0.019	0.012	0.012
		(1.67)	(1.63)	(1.17)	(1.13)
Ret* Log(Vega)		-0.011	-0.009	-0.012	-0.011
		(-0.72)	(-0.60)	(-0.93)	(-0.85)
Neg* Log(Vega)		-0.015	-0.014	-0.004	-0.004
		(-1.12)	(-1.11)	(-0.32)	(-0.31)
Ret*Neg* Log(Vega)		0.029	0.025	0.053**	0.051**
		(0.99)	(0.86)	(2.14)	(2.05)
Log(Delta)		0.012	0.011	0.011	0.011
		(1.05)	(0.99)	(1.18)	(1.15)
Ret* Log(Delta)		0.031	0.030	0.002	0.001
		(1.36)	(1.30)	(0.09)	(0.03)
Neg* Log(Delta)		-0.031**	-0.030**	-0.026**	-0.027**
		(-2.30)	(-2.32)	(-2.37)	(-2.40)
Ret*Neg* Log(Delta)		-0.207***	-0.204***	-0.122***	-0.120***
		(-4.90)	(-4.80)	(-3.41)	(-3.33)
Salary		0.052	0.055	0.045	0.048
		(0.68)	(0.73)	(0.67)	(0.71)
Ret* Salarypct		-0.206*	-0.219**	-0.187**	-0.195**
		(-1.91)	(-2.01)	(-2.02)	(-2.09)
Neg* Salarypct		-0.073	-0.073	-0.098	-0.100
		(-0.81)	(-0.81)	(-1.27)	(-1.29)
Ret*Neg* Salarypct		0.343	0.355*	0.180	0.184

		(1.64)	(1.67)	(1.06)	(1.07)
EDF				-0.292***	-0.292***
				(-3.10)	(-3.05)
Ret*EDF				-0.195**	-0.196**
				(-2.09)	(-1.97)
Neg*EDF				-0.048	-0.049
				(-0.24)	(-0.24)
Ret*Neg*EDF				0.799**	0.810**
				(2.28)	(2.30)
Size	0.008	-0.014	-0.011	-0.007	-0.006
	(1.64)	(-1.55)	(-1.30)	(-0.96)	(-0.76)
Ret*Size	0.017	0.006	0.004	0.025	0.023
	(1.33)	(0.46)	(0.31)	(1.62)	(1.51)
Neg*Size	0.006	0.029**	0.028**	0.014	0.014
	(0.81)	(2.56)	(2.49)	(1.52)	(1.47)
Ret*Neg*Size	-0.002	0.108***	0.105***	0.030	0.027
	(-0.08)	(3.51)	(3.47)	(1.07)	(0.98)
Lev	-0.170***	-0.150**	-0.145**	-0.074	-0.069
	(-2.59)	(-2.17)	(-2.08)	(-1.02)	(-0.94)
Ret*Lev	0.261**	0.359**	0.324**	0.430***	0.408***
	(2.33)	(2.53)	(2.27)	(2.84)	(2.63)
Neg*Lev	0.194**	0.161*	0.157	0.091	0.086
	(1.98)	(1.68)	(1.62)	(0.97)	(0.91)
Ret*Neg*Lev	0.239	-0.107	-0.035	-0.369	-0.327
	(0.95)	(-0.44)	(-0.14)	(-1.48)	(-1.29)
MB	-0.010	-0.020	-0.016	-0.001	0.001
	(-0.74)	(-1.53)	(-1.25)	(-0.13)	(0.08)
Ret*MB	0.089***	0.048	0.040	-0.010	-0.014
	(2.59)	(1.46)	(1.26)	(-0.36)	(-0.54)
Neg*MB	-0.001	0.030*	0.027*	0.009	0.007
	(-0.05)	(1.88)	(1.67)	(0.60)	(0.47)
Ret*Neg*MB	-0.276***	-0.081	-0.076	-0.042	-0.038
	(-4.80)	(-1.50)	(-1.41)	(-0.88)	(-0.81)
Lit	-0.021	-0.030	-0.033	-0.030	-0.031
	(-0.65)	(-1.09)	(-1.20)	(-1.14)	(-1.21)
Ret*Lit	0.036	0.041	0.029	0.043	0.035
	(0.54)	(0.81)	(0.57)	(0.97)	(0.80)
Neg*Lit	0.004	0.007	0.005	0.027	0.026
	(0.13)	(0.24)	(0.19)	(1.02)	(0.99)
Ret*Neg*Lit	0.011	-0.035	-0.016	0.019	0.033
	(0.11)	(-0.43)	(-0.20)	(0.25)	(0.43)
Constant	-0.016	0.029	0.013	-0.072	-0.083
	(-0.26)	(0.37)	(0.17)	(-1.08)	(-1.25)
Industry effect	Included	Included	Included	Included	Included
Year effect	Included	Included	Included	Included	Included
Observations	3,018	3,018	3,018	3,018	3,018
Adj. R-squared	0.26	0.33	0.32	0.43	0.42

Table 3. The effect of default probability on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm's default probability at the beginning of a fiscal year is above or below sample median. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	High default probability	Low default probability	High default probability	Low default probability
Ret	-0.095	0.047	-0.044	0.037
	(-0.61)	(0.74)	(-0.29)	(0.61)
Neg	0.066	0.147**	0.091	0.145**
	(0.37)	(2.43)	(0.51)	(2.43)
Ret*Neg	0.469	0.600***	0.416	0.612***
	(1.24)	(2.94)	(1.09)	(3.12)
Log(1+CEO Relative leverage)	0.013	0.005		
	(0.31)	(0.73)		
Ret* Log(1+CEO Relative leverage)	0.018	0.006		
	(0.23)	(0.27)		
Neg* Log(1+ CEO relative leverage)	-0.034	0.007		
	(-0.65)	(0.60)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.333****	***-0.010***		
	(-2.57)	***(-0.19)***		
High relative leverage			0.023	0.008
			(0.51)	(1.05)
Ret* High relative leverage			-0.036	-0.005
			(-0.36)	(-0.23)
Neg* High relative leverage			-0.049	0.003
			(-0.89)	(0.23)
Ret*Neg* High relative leverage			***-0.275****	***-0.006***
			(-2.05)	***(-0.12)***
Log(Vega)	0.017	-0.002	0.016	-0.002
	(0.96)	(-0.68)	(0.94)	(-0.73)
Ret* Log(Vega)	-0.014	-0.002	-0.013	-0.001
	(-0.89)	(-0.14)	(-0.82)	(-0.06)
Neg* Log(Vega)	-0.003	0.006	-0.003	0.006
	(-0.13)	(1.13)	(-0.15)	(1.13)
Ret*Neg* Log(Vega)	0.074**	0.020	0.071**	0.019
	(2.29)	(1.19)	(2.20)	(1.11)
Log(Delta)	0.020	0.006	0.019	0.006
	(1.25)	(0.70)	(1.16)	(0.73)
Ret* Log(Delta)	-0.005	0.000	-0.005	-0.001
	(-0.18)	(0.03)	(-0.20)	(-0.07)
Neg* Log(Delta)	-0.045**	-0.002	-0.044**	-0.003
	(-2.26)	(-0.21)	(-2.22)	(-0.28)
Ret*Neg* Log(Delta)	-0.162***	-0.008	-0.157***	-0.007
	(-3.48)	(-0.38)	(-3.35)	(-0.35)
Salarypct	0.034	-0.021	0.036	-0.023
	(0.31)	(-0.37)	(0.32)	(-0.39)
Ret* Salarypct	-0.197*	-0.089	-0.207**	-0.081

	(-1.90)	(-0.97)	(-1.97)	(-0.91)
Neg* Salarypct	-0.134	-0.018	-0.133	-0.017
	(-1.07)	(-0.29)	(-1.07)	(-0.27)
Ret*Neg* Salarypct	0.150	-0.080	0.164	-0.093
	(0.67)	(-0.61)	(0.72)	(-0.72)
EDF	-0.243**	-8.175	-0.244**	-8.275
	(-2.25)	(-1.30)	(-2.22)	(-1.31)
Ret*EDF	-0.236**	13.354	-0.234**	13.938
	(-2.23)	(1.33)	(-2.06)	(1.37)
Neg*EDF	-0.069	-5.706	-0.065	-6.407
	(-0.32)	(-0.65)	(-0.30)	(-0.73)
Ret*Neg*EDF	0.794**	-29.315	0.812**	-31.780
	(2.13)	(-1.39)	(2.16)	(-1.50)
Size	-0.011	0.002	-0.008	0.002
	(-0.74)	(0.69)	(-0.51)	(0.67)
Ret*Size	0.031*	-0.002	0.028	0.000
	(1.71)	(-0.15)	(1.53)	(0.02)
Neg*Size	0.027	-0.013**	0.025	-0.012**
	(1.49)	(-2.55)	(1.38)	(-2.47)
Ret*Neg*Size	0.055	-0.031	0.051	-0.032*
	(1.47)	(-1.49)	(1.38)	(-1.66)
Lev	-0.154	0.061*	-0.150	0.060*
	(-1.17)	(1.76)	(-1.15)	(1.73)
Ret*Lev	0.488**	0.054	0.462**	0.056
	(2.54)	(0.71)	(2.32)	(0.73)
Neg*Lev	0.085	-0.053	0.077	-0.051
	(0.51)	(-1.18)	(0.46)	(-1.14)
Ret*Neg*Lev	-0.613*	-0.234	-0.554	-0.235
	(-1.80)	(-1.63)	(-1.61)	(-1.60)
MB	0.045	-0.004	0.052	-0.004
	(0.98)	(-0.76)	(1.16)	(-0.71)
Ret*MB	-0.048	0.001	-0.056	0.001
	(-0.78)	(0.11)	(-0.93)	(0.15)
Neg*MB	0.019	-0.010	0.011	-0.010
	(0.32)	(-1.27)	(0.19)	(-1.28)
Ret*Neg*MB	0.087	-0.093***	0.088	-0.092***
	(0.69)	(-3.68)	(0.70)	(-3.70)
Lit	-0.059	-0.002	-0.064	-0.003
	(-0.98)	(-0.17)	(-1.05)	(-0.21)
Ret*Lit	0.064	-0.010	0.056	-0.011
	(1.13)	(-0.33)	(1.00)	(-0.37)
Neg*Lit	0.051	-0.004	0.048	-0.003
	(0.85)	(-0.27)	(0.80)	(-0.22)
Ret*Neg*Lit	0.023	0.029	0.033	0.033
	(0.20)	(0.53)	(0.28)	(0.60)
Constant	-0.080	-0.015	-0.111	-0.014
	(-0.52)	(-0.43)	(-0.72)	(-0.40)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	1,509	1,509	1,509	1,509
Adj. R-squared	0.42	0.21	0.42	0.21

Table 4. The effect of Z-score on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm's Z-score at the beginning of a fiscal year is above or below 1.81. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Zscore>=1.81	Zscore<1.81	Zscore>=1.81	Zscore<1.81
Ret	0.064	-0.539*	0.051	-0.458
	(0.37)	(-1.74)	(0.30)	(-1.63)
Neg	0.108	-0.370	0.111	-0.352
	(1.35)	(-1.24)	(1.39)	(-1.20)
Ret*Neg	0.493**	0.590	0.527**	0.434
	(1.98)	(0.95)	(2.12)	(0.69)
Log(1+ CEO relative leverage)	0.008	-0.023		
	(0.54)	(-0.30)		
Ret* Log(1+ CEO relative leverage)	-0.014	0.346**		
	(-0.30)	(2.51)		
Neg* Log(1+ CEO relative leverage)	-0.016	-0.013		
	(-0.78)	(-0.15)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.097***	***-0.799******		
	(-1.41)	***(-3.20)***		
High relative leverage			0.029	-0.061
			(1.56)	(-0.85)
Ret* High relative leverage			-0.084	0.454**
			(-1.19)	(2.44)
Neg* High relative leverage			-0.030	0.050
			(-1.39)	(0.49)
Ret*Neg* High relative leverage			***-0.011***	***-0.768******
			(-0.13)	***(-3.28)***
Log(Vega)	0.004	0.034	0.003	0.034
	(1.17)	(1.15)	(0.97)	(1.14)
Ret* Log(Vega)	-0.012	-0.004	-0.011	-0.007
	(-1.49)	(-0.19)	(-1.36)	(-0.29)
Neg* Log(Vega)	-0.006	-0.012	-0.005	-0.014
	(-1.06)	(-0.40)	(-0.95)	(-0.46)
Ret*Neg* Log(Vega)	0.015	0.091**	0.013	0.085*
	(0.89)	(2.04)	(0.79)	(1.92)
Log(Delta)	-0.002	0.025	-0.001	0.024
	(-0.20)	(1.07)	(-0.16)	(1.06)
Ret* Log(Delta)	0.012	-0.009	0.012	-0.021
	(0.64)	(-0.27)	(0.62)	(-0.60)
Neg* Log(Delta)	-0.001	-0.053*	-0.000	-0.049*
	(-0.05)	(-1.81)	(-0.04)	(-1.73)
Ret*Neg* Log(Delta)	-0.072**	-0.150**	-0.069**	-0.119*
	(-2.51)	(-2.13)	(-2.39)	(-1.74)
Salarypct	0.004	0.020	0.006	0.019
	(0.07)	(0.10)	(0.12)	(0.09)
Ret* Salarypct	-0.122	-0.238*	-0.125	-0.252*
	(-0.77)	(-1.70)	(-0.82)	(-1.85)

Neg* Salarypct	-0.064	-0.085	-0.066	-0.074
	(-1.03)	(-0.39)	(-1.08)	(-0.34)
Ret*Neg* Salarypct	0.018	0.336	0.017	0.370
	(0.10)	(1.00)	(0.09)	(1.09)
EDF	-0.349***	-0.217*	-0.364***	-0.197
	(-3.42)	(-1.65)	(-3.32)	(-1.53)
Ret*EDF	-0.145	-0.019	-0.114	-0.097
	(-1.29)	(-0.14)	(-1.02)	(-0.67)
Neg*EDF	0.748	-0.056	0.756	-0.061
	(1.31)	(-0.23)	(1.32)	(-0.25)
Ret*Neg*EDF	2.700**	0.605	2.664**	0.749*
	(2.47)	(1.46)	(2.40)	(1.82)
Size	0.007	-0.039*	0.006	-0.034
	(1.13)	(-1.67)	(1.01)	(-1.52)
Ret*Size	-0.011	0.055**	-0.006	0.060**
	(-0.55)	(2.26)	(-0.33)	(2.47)
Neg*Size	-0.005	0.065**	-0.005	0.061**
	(-0.52)	(2.23)	(-0.53)	(2.18)
Ret*Neg*Size	0.043	0.028	0.031	0.013
	(1.28)	(0.54)	(0.98)	(0.25)
Lev	-0.054	-0.043	-0.031	-0.097
	(-0.97)	(-0.18)	(-0.61)	(-0.40)
Ret*Lev	0.568***	0.229	0.490***	0.363
	(2.76)	(0.90)	(2.93)	(1.42)
Neg*Lev	0.116	-0.075	0.096	-0.032
	(1.60)	(-0.29)	(1.40)	(-0.13)
Ret*Neg*Lev	-0.636**	-0.518	-0.536**	-0.601
	(-2.28)	(-1.13)	(-2.12)	(-1.30)
MB	0.006	-0.042	0.006	-0.018
	(0.75)	(-0.36)	(0.74)	(-0.16)
Ret*MB	-0.019	0.071	-0.019	0.032
	(-0.87)	(0.71)	(-0.87)	(0.35)
Neg*MB	-0.015	0.173	-0.016	0.155
	(-1.39)	(1.35)	(-1.44)	(1.26)
Ret*Neg*MB	-0.087**	0.106	-0.089***	0.147
	(-2.55)	(0.70)	(-2.64)	(1.00)
Lit	-0.023	0.035	-0.022	0.028
	(-1.25)	(0.21)	(-1.25)	(0.16)
Ret*Lit	0.043	0.162**	0.036	0.147*
	(0.97)	(2.02)	(0.89)	(1.84)
Neg*Lit	0.037*	0.088	0.036*	0.102
	(1.69)	(0.55)	(1.67)	(0.63)
Ret*Neg*Lit	0.081	-0.358	0.093	-0.296
	(1.07)	(-1.33)	(1.26)	(-1.11)
Constant	-0.070	0.332	-0.068	0.244
	(-1.12)	(1.20)	(-1.08)	(0.94)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,249	769	2,249	769
Adj. R-squared	0.37	0.51	0.37	0.51

Table 5. The effect of growth options on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm's R&D/Sales ratio at the beginning of a fiscal year is above or below zero. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Positive R&D	Zero R&D	Positive R&D	Zero R&D
Ret	-0.038	-0.298	-0.005	-0.262
	(-0.34)	(-1.05)	(-0.04)	(-0.99)
Neg	-0.062	0.149	-0.046	0.164
	(-0.60)	(1.03)	(-0.44)	(1.15)
Ret*Neg	-0.191	1.053***	-0.232	1.035***
	(-0.66)	(2.71)	(-0.77)	(2.76)
Log(1+ CEO relative leverage)	0.004	0.019		
	(0.12)	(0.85)		
Ret* Log(1+ CEO relative leverage)	0.081	-0.061		
	(0.90)	(-1.01)		
Neg* Log(1+ CEO relative leverage)	-0.035	-0.032		
	(-0.91)	(-1.06)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.363******	***-0.079***		
	(-2.93)	***(-0.92)***		
High relative leverage			0.007	0.027
			(0.19)	(1.13)
Ret* High relative leverage			0.076	-0.125
			(0.62)	(-1.45)
Neg* High relative leverage			-0.041	-0.047
			(-0.89)	(-1.54)
Ret*Neg* High relative leverage			***-0.386******	***-0.028***
			(-2.62)	***(-0.27)***
Log(Vega)	0.003	0.011	0.002	0.011
	(0.13)	(0.87)	(0.11)	(0.88)
Ret* Log(Vega)	0.004	-0.000	0.003	-0.000
	(0.14)	(-0.03)	(0.13)	(-0.02)
Neg* Log(Vega)	-0.000	-0.005	-0.000	-0.005
	(-0.01)	(-0.36)	(-0.01)	(-0.38)
Ret*Neg* Log(Vega)	0.040	0.024	0.041	0.022
	(0.95)	(0.87)	(0.98)	(0.83)
Log(Delta)	0.011	0.016	0.009	0.015
	(0.56)	(1.28)	(0.49)	(1.24)
Ret* Log(Delta)	0.002	-0.006	0.004	-0.004
	(0.06)	(-0.18)	(0.09)	(-0.12)
Neg* Log(Delta)	-0.031	-0.027**	-0.030	-0.027**
	(-1.46)	(-1.97)	(-1.39)	(-1.99)
Ret*Neg* Log(Delta)	-0.169***	-0.088*	-0.173***	-0.089*
	(-2.66)	(-1.86)	(-2.70)	(-1.91)
Salarypct	0.055	0.015	0.063	0.015
	(0.72)	(0.17)	(0.82)	(0.17)
Ret* Salarypct	-0.150	-0.174	-0.150	-0.172
	(-1.07)	(-1.40)	(-1.02)	(-1.47)

Neg* Salarypct	-0.102	-0.079	-0.104	-0.080
	(-0.98)	(-0.81)	(-1.00)	(-0.83)
Ret*Neg* Salarypct	0.201	0.103	0.221	0.087
	(0.99)	(0.44)	(1.08)	(0.37)
EDF	-0.283**	-0.342***	-0.281*	-0.343***
	(-1.99)	(-2.95)	(-1.95)	(-2.97)
Ret*EDF	-0.198**	-0.111	-0.209*	-0.105
	(-2.02)	(-0.78)	(-1.90)	(-0.75)
Neg*EDF	-0.275	0.054	-0.320	0.058
	(-0.59)	(0.24)	(-0.68)	(0.26)
Ret*Neg*EDF	2.643*	0.856**	2.523	0.865**
	(1.79)	(2.19)	(1.65)	(2.22)
Size	0.006	-0.011	0.008	-0.010
	(0.46)	(-0.98)	(0.65)	(-0.86)
Ret*Size	-0.005	0.043	-0.006	0.040
	(-0.14)	(1.54)	(-0.19)	(1.46)
Neg*Size	0.024	0.014	0.021	0.013
	(1.39)	(0.98)	(1.23)	(0.92)
Ret*Neg*Size	0.167***	-0.015	0.166**	-0.015
	(2.62)	(-0.39)	(2.55)	(-0.41)
Lev	-0.224*	-0.018	-0.229	-0.012
	(-1.71)	(-0.20)	(-1.64)	(-0.13)
Ret*Lev	0.613**	0.367*	0.620*	0.327*
	(2.03)	(1.88)	(1.89)	(1.74)
Neg*Lev	0.342**	-0.044	0.352**	-0.054
	(2.17)	(-0.38)	(2.14)	(-0.47)
Ret*Neg*Lev	-0.214	-0.602**	-0.189	-0.552*
	(-0.47)	(-2.02)	(-0.39)	(-1.87)
MB	-0.006	0.007	-0.003	0.009
	(-0.32)	(0.45)	(-0.13)	(0.60)
Ret*MB	-0.021	0.014	-0.027	0.009
	(-0.48)	(0.37)	(-0.60)	(0.25)
Neg*MB	0.027	-0.017	0.022	-0.018
	(1.20)	(-0.84)	(0.99)	(-0.93)
Ret*Neg*MB	0.028	-0.133**	0.031	-0.130**
	(0.47)	(-2.08)	(0.53)	(-2.06)
Lit	-0.011	-0.160***	-0.013	-0.154***
	(-0.33)	(-3.03)	(-0.40)	(-2.94)
Ret*Lit	0.009	0.180**	-0.001	0.172**
	(0.17)	(2.25)	(-0.02)	(2.23)
Neg*Lit	-0.006	0.088**	-0.006	0.085**
	(-0.18)	(2.46)	(-0.16)	(2.42)
Ret*Neg*Lit	-0.052	-0.051	-0.033	-0.039
	(-0.51)	(-0.42)	(-0.33)	(-0.32)
Constant	-0.085	-0.056	-0.108*	-0.070
	(-1.33)	(-0.45)	(-1.70)	(-0.57)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	1,139	1,879	1,139	1,879
Adj. R-squared	0.44	0.45	0.44	0.45

Table 6. The effect of CEO horizon problems on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether CEO age at the beginning of a fiscal year is above or below sample median. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Age>=60	Age<60	Age>=60	Age<60
Ret	-0.508*	-0.082	-0.462*	-0.045
	(-1.94)	(-0.63)	(-1.74)	(-0.33)
Neg	-0.117	0.072	-0.103	0.086
	(-0.70)	(0.70)	(-0.61)	(0.83)
Ret*Neg	0.697	0.553**	0.671	0.527*
	(1.41)	(2.06)	(1.34)	(1.94)
Log(1+ CEO relative leverage)	-0.034	0.026		
	(-1.20)	(1.21)		
Ret* Log(1+ CEO relative leverage)	0.153	-0.044		
	(1.57)	(-0.78)		
Neg* Log(1+ CEO relative leverage)	0.010	-0.026		
	(0.26)	(-0.96)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.378******	***-0.100***		
	(-2.77)	***(-1.24)***		
High relative leverage			-0.038	0.039*
			(-1.32)	(1.75)
Ret* High relative leverage			0.169*	-0.126
			(1.65)	(-1.61)
Neg* High relative leverage			0.026	-0.052*
			(0.64)	(-1.87)
Ret*Neg* High relative leverage			***-0.366******	***-0.050***
			(-2.62)	***(-0.52)***
Log(Vega)	-0.004	0.021	-0.004	0.020
	(-0.77)	(1.41)	(-0.92)	(1.38)
Ret* Log(Vega)	-0.007	-0.014	-0.005	-0.012
	(-0.46)	(-0.93)	(-0.33)	(-0.83)
Neg* Log(Vega)	0.007	-0.009	0.006	-0.008
	(0.55)	(-0.56)	(0.52)	(-0.55)
Ret*Neg* Log(Vega)	0.013	0.064**	0.005	0.062**
	(0.26)	(2.32)	(0.10)	(2.24)
Log(Delta)	-0.009	0.006	-0.008	0.005
	(-0.67)	(0.49)	(-0.59)	(0.39)
Ret* Log(Delta)	0.029	0.014	0.024	0.015
	(0.88)	(0.49)	(0.71)	(0.55)
Neg* Log(Delta)	-0.011	-0.021	-0.011	-0.020
	(-0.55)	(-1.43)	(-0.56)	(-1.40)
Ret*Neg* Log(Delta)	-0.188***	-0.119***	-0.179***	-0.120***
	(-2.93)	(-2.59)	(-2.72)	(-2.61)
Salarypct	-0.030	0.060	-0.034	0.062
	(-0.52)	(0.63)	(-0.62)	(0.66)
Ret* Salarypct	0.068	-0.230*	0.090	-0.239*
	(0.57)	(-1.74)	(0.77)	(-1.83)

Neg* Salarypct	-0.062	-0.083	-0.058	-0.084
	(-0.56)	(-0.80)	(-0.52)	(-0.83)
Ret*Neg* Salarypct	-0.275	0.353*	-0.321	0.358*
	(-0.90)	(1.72)	(-1.03)	(1.75)
EDF	-0.121	-0.377***	-0.111	-0.385***
	(-1.05)	(-3.34)	(-0.95)	(-3.39)
Ret*EDF	-0.514***	-0.066	-0.563***	-0.048
	(-4.32)	(-0.70)	(-4.67)	(-0.51)
Neg*EDF	0.115	-0.130	0.109	-0.122
	(0.65)	(-0.49)	(0.61)	(-0.47)
Ret*Neg*EDF	1.664***	0.270	1.726***	0.261
	(4.59)	(0.59)	(4.73)	(0.57)
Size	0.001	-0.011	0.002	-0.009
	(0.12)	(-1.26)	(0.18)	(-1.03)
Ret*Size	0.050	0.016	0.052	0.013
	(1.41)	(1.00)	(1.45)	(0.81)
Neg*Size	0.016	0.016	0.015	0.015
	(1.09)	(1.34)	(1.10)	(1.27)
Ret*Neg*Size	0.053	0.030	0.045	0.030
	(1.08)	(0.88)	(0.93)	(0.89)
Lev	-0.240**	-0.029	-0.232**	-0.016
	(-2.37)	(-0.39)	(-2.33)	(-0.21)
Ret*Lev	0.836***	0.330**	0.829***	0.275**
	(3.27)	(2.52)	(3.21)	(2.19)
Neg*Lev	0.352***	0.024	0.355***	0.002
	(2.61)	(0.23)	(2.63)	(0.02)
Ret*Neg*Lev	-0.302	-0.418*	-0.238	-0.366
	(-0.66)	(-1.83)	(-0.51)	(-1.61)
MB	0.030	-0.003	0.033	-0.001
	(1.33)	(-0.27)	(1.47)	(-0.06)
Ret*MB	-0.140**	-0.007	-0.147**	-0.012
	(-2.14)	(-0.27)	(-2.26)	(-0.47)
Neg*MB	-0.002	0.001	-0.005	-0.001
	(-0.07)	(0.05)	(-0.17)	(-0.06)
Ret*Neg*MB	0.220**	-0.089*	0.222**	-0.083*
	(2.22)	(-1.91)	(2.20)	(-1.82)
Lit	-0.051	-0.041	-0.058	-0.045
	(-1.22)	(-1.47)	(-1.41)	(-1.62)
Ret*Lit	0.141	0.039	0.128	0.035
	(1.56)	(1.06)	(1.46)	(0.98)
Neg*Lit	0.016	0.045*	0.016	0.047*
	(0.25)	(1.81)	(0.26)	(1.92)
Ret*Neg*Lit	-0.122	0.034	-0.101	0.044
	(-0.63)	(0.50)	(-0.53)	(0.64)
Constant	0.242**	-0.040	0.224**	-0.047
	(2.26)	(-0.48)	(2.09)	(-0.55)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	824	2,194	824	2,194
Adj. R-squared	0.60	0.39	0.60	0.40

Table 7. The effect of debt reliance on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm's leverage at the beginning of a fiscal year is above or below sample median. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	High leverage	Low leverage	High leverage	Low leverage
Ret	0.195	0.018	0.221	0.045
	(1.21)	(0.10)	(1.37)	(0.27)
Neg	0.132	0.113	0.137	0.121
	(0.81)	(1.11)	(0.83)	(1.20)
Ret*Neg	0.058	0.503*	0.003	0.484*
	(0.13)	(1.79)	(0.01)	(1.76)
Log(1+ CEO relative leverage)	0.034	-0.024		
	(1.27)	(-1.08)		
Ret* Log(1+ CEO relative leverage)	0.045	0.052		
	(0.73)	(0.81)		
Neg* Log(1+ CEO relative leverage)	-0.077**	0.023		
	(-2.18)	(0.84)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.444******	***-0.125***		
	(-4.15)	***(-1.49)***		
High relative leverage			0.023	-0.020
			(1.00)	(-0.65)
Ret* High relative leverage			0.079	0.001
			(1.10)	(0.01)
Neg* High relative leverage			-0.075**	0.024
			(-2.32)	(0.68)
Ret*Neg* High relative leverage			***-0.497******	***-0.066***
			(-4.42)	***(-0.60)***
Log(Vega)	0.012	0.009	0.013	0.009
	(0.71)	(1.36)	(0.71)	(1.26)
Ret* Log(Vega)	-0.004	-0.043*	-0.004	-0.040*
	(-0.20)	(-1.85)	(-0.21)	(-1.71)
Neg* Log(Vega)	0.002	-0.006	0.000	-0.005
	(0.11)	(-0.76)	(0.01)	(-0.65)
Ret*Neg* Log(Vega)	0.065	0.054*	0.061	0.051*
	(1.63)	(1.87)	(1.52)	(1.76)
Log(Delta)	0.020	-0.001	0.019	-0.002
	(1.34)	(-0.09)	(1.34)	(-0.18)
Ret* Log(Delta)	-0.010	0.033	-0.011	0.035
	(-0.35)	(0.95)	(-0.40)	(1.01)
Neg* Log(Delta)	-0.047***	0.001	-0.046***	0.002
	(-2.62)	(0.08)	(-2.62)	(0.17)
Ret*Neg* Log(Delta)	-0.164***	-0.080*	-0.158***	-0.081*
	(-2.84)	(-1.88)	(-2.76)	(-1.89)
Salarypct	0.181***	-0.089	0.185***	-0.087
	(2.84)	(-0.75)	(2.91)	(-0.75)
Ret* Salarypct	-0.353***	-0.067	-0.357***	-0.062
	(-4.31)	(-0.34)	(-4.47)	(-0.32)

Neg* Salarypct	-0.172*	0.004	-0.174*	0.007
	(-1.70)	(0.03)	(-1.71)	(0.06)
Ret*Neg* Salarypct	0.577**	-0.093	0.578**	-0.092
	(2.19)	(-0.41)	(2.16)	(-0.40)
EDF	-0.304***	-0.293	-0.305***	-0.311
	(-3.31)	(-1.17)	(-3.27)	(-1.22)
Ret*EDF	-0.081	-0.417**	-0.089	-0.389**
	(-0.77)	(-2.56)	(-0.84)	(-2.22)
Neg*EDF	-0.086	0.125	-0.083	0.151
	(-0.36)	(0.42)	(-0.35)	(0.50)
Ret*Neg*EDF	0.384	1.800***	0.404	1.793***
	(0.90)	(4.51)	(0.95)	(4.44)
Size	-0.013	0.002	-0.011	0.003
	(-0.94)	(0.23)	(-0.78)	(0.43)
Ret*Size	0.009	0.028	0.007	0.025
	(0.37)	(1.21)	(0.30)	(1.10)
Neg*Size	0.028	-0.003	0.027	-0.004
	(1.61)	(-0.26)	(1.62)	(-0.41)
Ret*Neg*Size	0.096**	-0.016	0.094**	-0.016
	(2.01)	(-0.49)	(1.97)	(-0.51)
Lev	0.067	0.243*	0.056	0.257*
	(0.49)	(1.69)	(0.42)	(1.68)
Ret*Lev	0.172	-0.639	0.200	-0.667
	(0.84)	(-1.45)	(0.96)	(-1.46)
Neg*Lev	-0.072	-0.020	-0.069	-0.043
	(-0.36)	(-0.11)	(-0.35)	(-0.23)
Ret*Neg*Lev	-0.246	1.125**	-0.240	1.134**
	(-0.51)	(2.05)	(-0.49)	(2.03)
MB	-0.000	0.019	0.004	0.021
	(-0.01)	(1.37)	(0.28)	(1.45)
Ret*MB	-0.055*	-0.037	-0.063*	-0.040
	(-1.69)	(-1.28)	(-1.80)	(-1.40)
Neg*MB	0.017	-0.020	0.016	-0.021
	(0.61)	(-1.24)	(0.55)	(-1.34)
Ret*Neg*MB	0.050	-0.055	0.058	-0.052
	(0.55)	(-1.19)	(0.62)	(-1.13)
Lit	-0.029	-0.014	-0.033	-0.011
	(-0.75)	(-0.49)	(-0.86)	(-0.40)
Ret*Lit	0.001	0.043	-0.003	0.030
	(0.02)	(0.63)	(-0.06)	(0.45)
Neg*Lit	0.002	0.024	-0.002	0.021
	(0.04)	(0.80)	(-0.05)	(0.72)
Ret*Neg*Lit	0.050	0.033	0.045	0.053
	(0.37)	(0.36)	(0.33)	(0.62)
Constant	-0.151	-0.129	-0.170	-0.132
	(-1.05)	(-1.61)	(-1.18)	(-1.61)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	1,517	1,501	1,517	1,501
Adj. R-squared	0.42	0.50	0.42	0.50

Table 8. The effect of short-term borrowing on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm's percentage of debt that is due within three years (Pct3years) at the beginning of a fiscal year is above or below sample median. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Pct3years < median	Pct3years >=median	Pct3years < median	Pct3years >=median
Ret	-0.114	-0.129	-0.109	-0.194
	(-0.69)	(-0.63)	(-0.66)	(-1.01)
Neg	0.169	0.047	0.168	0.042
	(1.16)	(0.41)	(1.15)	(0.37)
Ret*Neg	0.835*	0.543*	0.845*	0.538*
	(1.87)	(1.76)	(1.89)	(1.70)
Log(1+ CEO relative leverage)	0.019	-0.007		
	(0.61)	(-0.28)		
Ret* Log(1+ CEO relative leverage)	-0.014	0.068		
	(-0.14)	(0.88)		
Neg* Log(1+ CEO relative leverage)	-0.013	-0.003		
	(-0.31)	(-0.09)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.136***	***-0.235*** **		
	(-1.07)	***(-2.43)***		
High relative leverage			0.031	-0.004
			(0.87)	(-0.12)
Ret* High relative leverage			-0.079	0.042
			(-0.64)	(0.39)
Neg* High relative leverage			-0.039	-0.005
			(-0.92)	(-0.16)
Ret*Neg* High relative leverage			***-0.113***	***-0.215****
			(-0.78)	***(-1.71)***
Log(Vega)	0.002	0.031	0.002	0.031
	(0.22)	(1.56)	(0.20)	(1.50)
Ret* Log(Vega)	-0.007	-0.022	-0.005	-0.017
	(-0.37)	(-1.09)	(-0.28)	(-0.79)
Neg* Log(Vega)	0.004	-0.015	0.004	-0.015
	(0.32)	(-0.74)	(0.32)	(-0.68)
Ret*Neg* Log(Vega)	0.039	0.077**	0.036	0.076**
	(1.08)	(2.42)	(1.02)	(2.23)
Log(Delta)	0.023*	-0.004	0.022*	-0.006
	(1.96)	(-0.34)	(1.91)	(-0.48)
Ret* Log(Delta)	-0.026	0.044	-0.028	0.045*
	(-1.06)	(1.59)	(-1.11)	(1.66)
Neg* Log(Delta)	-0.037**	-0.008	-0.038**	-0.005
	(-2.26)	(-0.50)	(-2.34)	(-0.35)
Ret*Neg* Log(Delta)	-0.105**	-0.162***	-0.104**	-0.163***
	(-2.04)	(-3.63)	(-2.02)	(-3.74)
Salarypct	-0.037	0.096	-0.037	0.101
	(-0.31)	(1.13)	(-0.31)	(1.24)
Ret* Salarypct	-0.083	-0.196	-0.092	-0.069

	(-0.69)	(-0.95)	(-0.78)	(-0.38)
Neg* Salarypct	-0.010	-0.118	-0.007	-0.089
	(-0.07)	(-1.18)	(-0.05)	(-0.90)
Ret*Neg* Salarypct	0.052	0.292	0.060	0.278
	(0.21)	(1.13)	(0.24)	(1.10)
EDF	-0.363**	-0.185*	-0.354**	-0.192*
	(-2.34)	(-1.92)	(-2.29)	(-1.91)
Ret*EDF	-0.165	-0.283***	-0.176	-0.283***
	(-1.01)	(-2.85)	(-1.08)	(-2.62)
Neg*EDF	-0.265	0.165	-0.282	0.181
	(-0.83)	(1.03)	(-0.88)	(1.12)
Ret*Neg*EDF	0.155	1.415***	0.150	1.448***
	(0.29)	(4.77)	(0.28)	(4.91)
Size	-0.007	-0.011	-0.006	-0.010
	(-0.69)	(-1.09)	(-0.62)	(-1.05)
Ret*Size	0.022	0.018	0.024	0.025
	(0.97)	(0.80)	(1.04)	(1.13)
Neg*Size	0.007	0.010	0.008	0.010
	(0.37)	(0.90)	(0.47)	(0.96)
Ret*Neg*Size	0.030	0.010	0.025	0.003
	(0.52)	(0.30)	(0.45)	(0.10)
Lev	0.014	-0.178*	0.009	-0.144
	(0.12)	(-1.91)	(0.08)	(-1.59)
Ret*Lev	0.383	0.566**	0.372	0.478**
	(1.62)	(2.34)	(1.58)	(2.16)
Neg*Lev	-0.088	0.285**	-0.090	0.249**
	(-0.62)	(2.31)	(-0.64)	(2.11)
Ret*Neg*Lev	-0.676*	-0.069	-0.657*	0.002
	(-1.81)	(-0.19)	(-1.79)	(0.01)
MB	-0.021	0.028*	-0.020	0.030**
	(-1.29)	(1.94)	(-1.17)	(2.13)
Ret*MB	0.047	-0.082***	0.046	-0.077***
	(1.29)	(-2.73)	(1.27)	(-2.66)
Neg*MB	0.021	-0.010	0.020	-0.013
	(0.87)	(-0.54)	(0.86)	(-0.75)
Ret*Neg*MB	-0.117*	0.052	-0.115*	0.044
	(-1.67)	(0.93)	(-1.67)	(0.82)
Lit	-0.047	-0.018	-0.052	-0.007
	(-1.06)	(-0.57)	(-1.17)	(-0.22)
Ret*Lit	0.074*	-0.002	0.070*	-0.048
	(1.69)	(-0.03)	(1.65)	(-0.58)
Neg*Lit	0.031	0.037	0.031	0.026
	(0.80)	(1.00)	(0.81)	(0.70)
Ret*Neg*Lit	-0.036	0.105	-0.026	0.160
	(-0.38)	(0.86)	(-0.28)	(1.31)
Constant	-0.063	-0.169*	-0.061	-0.222**
	(-0.69)	(-1.86)	(-0.65)	(-2.44)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	1,509	1,509	1,509	1,509
Adj. R-squared	0.41	0.48	0.41	0.48

Table 9. The effect of repeated borrowing on the relation between inside debt and conservatism

This table presents the subsample regression results of the augmented Basu (1997) model specified in equation (2). The subsamples are formed based on whether a firm has borrowed from a particular bank at least twice over the past ten years. The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Repeated borrowing	Non-repeated borrowing	Repeated borrowing	Non-repeated borrowing
Ret	-0.207	-0.145	-0.183	-0.087
	(-0.91)	(-1.02)	(-0.80)	(-0.66)
Neg	0.276**	-0.072	0.285**	-0.085
	(2.11)	(-0.68)	(2.18)	(-0.72)
Ret*Neg	1.373***	0.214	1.370***	0.105
	(3.43)	(0.72)	(3.39)	(0.36)
Log(1+ CEO relative leverage)	-0.002	0.001		
	(-0.07)	(0.04)		
Ret* Log(1+ CEO relative leverage)	0.022	0.043		
	(0.28)	(0.69)		
Neg* Log(1+ CEO relative leverage)	-0.040	-0.007		
	(-1.35)	(-0.24)		
Ret*Neg* Log(1+ CEO relative leverage)	***-0.296******	***-0.147***		
	(-2.89)	***(-1.38)***		
High relative leverage			0.007	0.026
			(0.27)	(0.82)
Ret* High relative leverage			-0.013	-0.022
			(-0.15)	(-0.20)
Neg* High relative leverage			-0.054*	-0.027
			(-1.69)	(-0.66)
Ret*Neg* High relative leverage			***-0.284******	***-0.101***
			(-2.64)	***(-0.76)***
Log(Vega)	0.019	0.011	0.019	0.009
	(1.06)	(1.52)	(1.05)	(1.10)
Ret* Log(Vega)	-0.016	-0.017	-0.016	-0.017
	(-0.81)	(-1.09)	(-0.79)	(-1.15)
Neg* Log(Vega)	-0.018	0.010	-0.018	0.014
	(-0.99)	(0.77)	(-1.01)	(0.98)
Ret*Neg* Log(Vega)	0.036	0.080**	0.033	0.084**
	(1.18)	(2.10)	(1.08)	(2.13)
Log(Delta)	0.019	0.003	0.019	0.004
	(1.62)	(0.22)	(1.65)	(0.26)
Ret* Log(Delta)	-0.019	0.024	-0.021	0.024
	(-0.69)	(0.84)	(-0.77)	(0.84)
Neg* Log(Delta)	-0.039***	-0.013	-0.038***	-0.019
	(-2.81)	(-0.78)	(-2.80)	(-0.98)
Ret*Neg* Log(Delta)	-0.109**	-0.134***	-0.104**	-0.152***
	(-2.32)	(-2.82)	(-2.25)	(-2.96)
Salarypct	0.045	0.074	0.046	0.035
	(0.32)	(1.60)	(0.32)	(0.69)
Ret* Salarypct	-0.133	-0.232***	-0.140	-0.228***

	(-0.76)	(-3.04)	(-0.80)	(-2.92)
Neg* Salarypct	-0.139	-0.071	-0.142	-0.065
	(-0.93)	(-1.03)	(-0.95)	(-0.88)
Ret*Neg* Salarypct	-0.125	0.393**	-0.142	0.374*
	(-0.46)	(2.12)	(-0.52)	(1.87)
EDF	-0.320**	-0.233**	-0.313**	-0.237**
	(-2.39)	(-2.12)	(-2.33)	(-2.21)
Ret*EDF	-0.277**	-0.152*	-0.286**	-0.138*
	(-1.97)	(-1.86)	(-2.00)	(-1.74)
Neg*EDF	0.004	-0.144	0.005	-0.127
	(0.02)	(-0.44)	(0.02)	(-0.37)
Ret*Neg*EDF	0.873**	0.750	0.906**	0.788
	(2.28)	(1.38)	(2.37)	(1.37)
Size	-0.006	-0.009	-0.006	-0.012
	(-0.47)	(-1.22)	(-0.47)	(-1.30)
Ret*Size	0.030	0.024*	0.031	0.020
	(0.94)	(1.68)	(0.98)	(1.56)
Neg*Size	0.014	0.014	0.013	0.016
	(0.96)	(1.14)	(0.90)	(1.23)
Ret*Neg*Size	0.009	0.031	0.000	0.044
	(0.18)	(0.93)	(0.00)	(1.39)
Lev	-0.092	-0.039	-0.087	-0.068
	(-0.81)	(-0.59)	(-0.77)	(-0.93)
Ret*Lev	0.542**	0.402***	0.528**	0.374***
	(2.18)	(3.06)	(2.07)	(2.76)
Neg*Lev	-0.052	0.170*	-0.054	0.200*
	(-0.38)	(1.68)	(-0.39)	(1.86)
Ret*Neg*Lev	-0.989***	-0.112	-0.958***	-0.031
	(-2.79)	(-0.38)	(-2.73)	(-0.10)
MB	-0.030*	0.015	-0.029*	0.019
	(-1.81)	(1.09)	(-1.78)	(1.36)
Ret*MB	0.071	-0.046	0.068	-0.056**
	(1.54)	(-1.54)	(1.48)	(-2.09)
Neg*MB	0.009	0.007	0.008	0.007
	(0.47)	(0.35)	(0.44)	(0.37)
Ret*Neg*MB	-0.214***	0.047	-0.209***	0.071
	(-3.13)	(0.82)	(-3.03)	(1.28)
Lit	-0.030	-0.039	-0.034	-0.021
	(-1.28)	(-1.23)	(-1.44)	(-0.52)
Ret*Lit	0.051	0.056	0.046	0.052
	(0.85)	(1.12)	(0.78)	(1.20)
Neg*Lit	0.045	0.034	0.047	0.030
	(1.35)	(0.94)	(1.43)	(0.77)
Ret*Neg*Lit	0.100	-0.055	0.116	-0.045
	(0.83)	(-0.59)	(0.96)	(-0.49)
Constant	-0.091	-0.036	-0.096	-0.060
	(-0.78)	(-0.48)	(-0.82)	(-0.78)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	1,662	1,356	1,662	1,356
Adj. R-squared	0.47	0.39	0.47	0.41

Table 10. The effect of CEO inside debt on the Ball and Shivakumar (2006) measure of conservatism

This table presents the regression results of the Ball and Shivakumar (2006) model specified in equation (3). The dependent variable is total accruals estimated as earnings before extraordinary items minus cash flows from operations scaled by total assets. CEO incentives from inside debt are measured by *CEO relative leverage* in columns (1) and (2) and *high relative leverage* in columns (3) and (4). All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)
△CF	-0.672	-0.604
	(-1.53)	(-1.33)
Neg	-0.017	-0.008
	(-0.66)	(-0.21)
△CF*Neg	0.165	0.178
	(0.25)	(0.26)
Log(1+ CEO relative leverage)	0.010**	
	(2.25)	
△CF *Log(1+ CEO relative leverage)	0.112	
	(1.02)	
Neg*Log(1+ CEO relative leverage)	-0.003	
	(-0.53)	
△CF *Neg*Log(1+ CEO relative leverage)	***-0.287****	
	(-1.71)	
High relative leverage		0.013**
		(2.16)
△CF *High relative leverage		0.185
		(1.34)
Neg*High relative leverage		-0.003
		(-0.35)
△CF *Neg*High relative leverage		***-0.409****
		(-2.06)
Log(Vega)	-0.001	-0.004**
	(-0.96)	(-2.21)
△CF * Log(Vega)	-0.024	-0.009
	(-0.74)	(-0.29)
Neg* Log(Vega)	0.001	0.001
	(0.72)	(0.41)
△CF *Neg* Log(Vega)	0.078	0.006
	(1.49)	(0.10)
Log(Delta)	0.003*	0.007***
	(1.85)	(2.84)
△CF * Log(Delta)	0.008	-0.056
	(0.16)	(-0.95)
Neg* Log(Delta)	-0.003	-0.005
	(-1.15)	(-1.41)
△CF *Neg* Log(Delta)	-0.096	0.006
	(-1.24)	(0.07)
Salarypct	0.005	0.002
	(0.42)	(0.09)
△CF * Salarypct	-0.000	0.208
	(-0.00)	(0.75)
Neg* Salarypct	-0.003	0.001

	(-0.16)	(0.06)
△CF *Neg* Salarypct	-0.226	-0.260
	(-0.47)	(-0.45)
EDF	-0.012	-0.024
	(-0.96)	(-1.36)
△CF *EDF	0.111	0.132
	(0.53)	(0.50)
Neg*EDF	-0.017	-0.014
	(-1.01)	(-0.62)
△CF *Neg*EDF	-0.001	-0.125
	(-0.00)	(-0.37)
Size	0.003*	0.004*
	(1.79)	(1.65)
△CF *Size	0.014	0.030
	(0.31)	(0.61)
Neg*Size	0.003	0.003
	(1.25)	(0.86)
△CF *Neg*Size	0.042	0.003
	(0.57)	(0.03)
Lev	0.011	0.027
	(0.72)	(1.38)
△CF *Lev	-0.098	-0.290
	(-0.28)	(-1.10)
Neg*Lev	0.014	0.025
	(0.87)	(1.19)
△CF *Neg*Lev	0.281	0.767
	(0.54)	(1.60)
MB	0.012***	0.016***
	(3.36)	(3.53)
△CF *MB	-0.066	0.036
	(-0.87)	(0.49)
Neg*MB	0.006	0.008
	(1.25)	(1.29)
△CF *Neg*MB	0.244*	0.110
	(1.91)	(1.00)
Lit	-0.008	-0.007
	(-0.85)	(-0.57)
△CF *Lit	0.268	0.095
	(1.48)	(0.39)
Neg*Lit	-0.009	-0.020
	(-0.89)	(-1.34)
△CF *Neg*Lit	-0.167	0.087
	(-0.58)	(0.22)
Constant	-0.107***	-0.147***
	(-4.69)	(-4.58)
Industry effect	Included	Included
Year effect	Included	Included
Observations	3,014	3,014
Adj. R-squared	0.33	0.27

Table 11. The effect of CEO inside debt on alternative measures of conservatism

This table presents the results from OLS regressions of alternative conservatism measures. The dependent variable is the *C_SCORE* measure in column (1), the amount of negative non-operating accruals (*NOA*) in column (2), the difference between skewness in cash flows and earnings (*SKEW*) in column (3), and a composite rank based on the above three metrics (*Rank*) in column (4). Results in Panel A are based on the continuous measure of CEO relative leverage, while those in Panel B are based on the dichotomous measure. All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: CEO relative leverage (continuous)				
	(1) C_SCORE	(2) NOA	(3) Skewness	(4) Rank
Log(1+ CEO relative leverage)	***-0.035****	***-0.015****	***-0.175****	***-1.258****
	(-2.77)	***(-5.08)***	***(-2.45)***	***(-4.82)***
Log(Vega)	-0.006	0.002**	0.011	0.031
	(-1.37)	(2.07)	(0.50)	(0.37)
Log(Delta)	-0.014***	-0.005***	-0.109***	-0.444***
	(-2.59)	(-3.16)	(-3.41)	(-3.93)
Salarypct	0.086**	0.004	-0.147	-0.101
	(2.27)	(0.42)	(-0.80)	(-0.16)
EDF	0.221***	0.039***	0.838***	3.882***
	(4.98)	(4.59)	(4.77)	(6.46)
Size	0.005	-0.004***	0.038	-0.351***
	(0.90)	(-2.65)	(1.07)	(-3.01)
Lev	0.028	-0.007	-0.247	2.749***
	(0.48)	(-0.64)	(-1.15)	(3.46)
MB	-0.108***	-0.003	-0.359***	-1.242***
	(-6.40)	(-1.30)	(-6.99)	(-6.33)
Lit	-0.058**	0.026***	0.456***	1.782***
	(-2.03)	(3.35)	(2.60)	(3.09)
Constant	-0.082	0.105***	2.503***	22.554***
	(-0.36)	(6.36)	(4.24)	(6.43)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,987	2,987	2,987	2,987
Adj. R-squared	0.28	0.18	0.14	0.19

Panel B: High relative leverage (dichotomous)				
	(1) C_SCORE	(2) NOA	(3) Skewness	(4) Rank
High relative leverage	***-0.029****	***-0.015*****	***-0.227*****	***-1.327*****
	(-2.14)	***(-4.93)***	***(-2.99)***	***(-4.78)***
Log(Vega)	-0.006	0.002**	0.012	0.030
	(-1.41)	(2.06)	(0.53)	(0.37)
Log(Delta)	-0.013**	-0.004***	-0.109***	-0.421***
	(-2.38)	(-2.93)	(-3.42)	(-3.76)
Salarypct	0.086**	0.004	-0.148	-0.115
	(2.26)	(0.40)	(-0.81)	(-0.18)
EDF	0.225***	0.040***	0.841***	3.962***
	(5.07)	(4.72)	(4.78)	(6.63)
Size	0.003	-0.005***	0.035	-0.398***
	(0.56)	(-3.15)	(1.00)	(-3.48)
Lev	0.035	-0.005	-0.252	2.862***
	(0.61)	(-0.46)	(-1.18)	(3.62)
MB	-0.109***	-0.004	-0.359***	-1.268***
	(-6.50)	(-1.48)	(-7.02)	(-6.48)
Lit	-0.054*	0.027***	0.459***	1.858***
	(-1.90)	(3.48)	(2.63)	(3.23)
Constant	-0.078	0.108***	2.544***	22.784***
	(-0.34)	(6.49)	(4.39)	(6.53)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,987	2,987	2,987	2,987
Adj. R-squared	0.28	0.18	0.14	0.19

Table 12. Two-stage least square (2SLS) regressions of accounting conservatism measures

This table presents the results of two-stage least squares regressions of accounting conservatism measures, where CEO relative leverage is instrumented by (i) the top personal income tax rate in the state where a firm is headquartered and (ii) the Gibbs estimate of a firm's equity trading costs developed by Hasbrouck (2009). Results in Panel A are based on the continuous measure of CEO relative leverage, while those in Panel B are based on the dichotomous measure. Definitions of all variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: 2SLS regressions using the continuous CEO relative leverage measure

Panel A.1: First-stage regression

Dependent variable: CEO relative leverage	
Gibbs estimate	-0.031***
	(-5.19)
Tax rate	0.642*
	(1.79)
Log(Vega)	0.012
	(1.54)
Log(Delta)	-0.097***
	(-9.72)
Salarypct	0.043
	(0.78)
EDF	-0.162***
	(-3.44)
Size	0.114***
	(10.00)
Lev	-0.616***
	(-8.62)
MB	0.109***
	(6.66)
Lit	-0.262***
	(-3.87)
Industry effect	Included
Year effect	Included
Observations	2,934
Adj. R-squared	0.25

Panel A.2: Second-stage regression

	Dependent variable: C_SCORE	NOA	Skewness	Rank
Predicted relative leverage	***-0.713******	***-0.061****	***-1.066****	***-7.978*****
	(-4.20)	***(-2.26)***	***(-1.97)***	***(-3.80)***
Log(Vega)	0.004	0.002*	0.012	0.102
	(0.43)	(1.96)	(0.46)	(0.96)
Log(Delta)	-0.081***	-0.010***	-0.222***	-1.189***
	(-4.91)	(-3.59)	(-3.94)	(-5.45)
Salarypct	0.106*	0.006	-0.097	0.156
	(1.93)	(0.61)	(-0.50)	(0.20)
EDF	0.075	0.037***	0.827***	3.016***
	(1.21)	(3.15)	(3.66)	(3.74)
Size	0.090***	0.002	0.176**	0.558**
	(4.24)	(0.70)	(2.48)	(2.01)
Lev	-0.378***	-0.029	-0.639	-0.852
	(-2.69)	(-1.38)	(-1.46)	(-0.49)
MB	-0.034	0.002	-0.256***	-0.481
	(-1.33)	(0.50)	(-3.17)	(-1.50)
Lit	-0.230***	0.013	0.248	0.116
	(-3.17)	(1.25)	(1.06)	(0.13)
Constant	-0.082	0.103***	2.377***	22.275***
	(-0.71)	(5.73)	(5.44)	(10.31)
Industry effect	Included	Included	Included	Included
Year effect	Included	Included	Included	Included
Observations	2,934	2,934	2,934	2,934
Adj. R-squared	0.29	0.08	0.07	0.20

Panel B: 2SLS regressions using the dichotomous CEO relative leverage measure

Panel B.1: First-stage regression		Panel B.2: Second-stage regression				
Dependent variable: High relative leverage			Dependent variable:			
			C_SCORE	NOA	Skewness	Rank
Gibbs estimate	-0.025***	***Predicted relative leverage***	***-0.824******	***-0.065****	***-1.372****	***-8.955*****
	(-5.07)		***(-4.02)***	***(-1.95)***	***(-2.09)***	***(-3.41)***
Tax rate	0.708**	Log(Vega)	0.005	0.002*	0.024	0.110
	(2.37)		(0.58)	(1.93)	(0.91)	(1.04)
Log(Vega)	0.013**	Log(Delta)	-0.073***	-0.009***	-0.225***	-1.089***
	(2.05)		(-4.70)	(-3.39)	(-4.34)	(-5.19)
Log(Delta)	-0.073***	Salarypct	0.101*	0.006	-0.015	0.094
	(-8.60)		(1.87)	(0.56)	(-0.08)	(0.12)
Salarypct	0.031	EDF	0.109*	0.040***	0.912***	3.353***
	(0.66)		(1.91)	(3.62)	(4.46)	(4.51)
EDF	-0.108***	Size	0.069***	0.000	0.153***	0.300
	(-2.69)		(3.95)	(0.04)	(2.81)	(1.28)
Size	0.072***	Lev	-0.348**	-0.023	-0.698*	-0.373
	(7.34)		(-2.54)	(-1.11)	(-1.89)	(-0.21)
Lev	-0.503***	MB	-0.043*	0.001	-0.238***	-0.609**
	(-8.80)		(-1.77)	(0.18)	(-3.33)	(-1.98)
MB	0.083***	Lit	-0.201***	0.017*	0.087	0.490
	(6.15)		(-3.04)	(1.66)	(0.58)	(0.58)
Lit	-0.194***	Constant	0.066	0.114***	3.340***	23.868***
	(-3.68)		(0.57)	(5.83)	(3.89)	(11.82)
Industry effect	Included	Industry effect	Included	Included	Included	Included
Year effect	Included	Year effect	Included	Included	Included	Included
Observations	2,934	Observations	2,934	2,934	2,934	2,934
Adj. R-squared	0.18	Adj. R-squared	0.29	0.08	0.01	0.19

Table 13. Regressions of accounting conservatism changes against changes in CEO relative leverage

This table presents the results of regressions of changes in accounting conservatism against changes in CEO relative leverage. Accounting conservatism is measured by *C_SCORE*, the firm-year conservatism metric developed by Khan and Watts (2009). Definitions of all variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) ΔC_SCORE	(2) ΔC_SCORE
ΔLog(1+ CEO relative leverage)	***-0.083****	***-0.106****
	(-1.69)	***(-1.85)***
ΔLog(Vega)		0.004
		(0.25)
ΔLog(Delta)		-0.107***
		(-4.33)
ΔSalarypct		0.125
		(1.15)
ΔEDF		0.183*
		(1.87)
ΔSize		0.233*
		(1.94)
ΔLev		0.060
		(0.18)
ΔMB		0.269***
		(4.50)
ΔLit		-0.040
		(-0.48)
Industry effect	Included	Included
Year effect	Included	Included
Observations	1,606	1,606
Adj. R-squared	0.04	0.08

Table 14. Event study of the effect of initial disclosure of inside debt on accounting conservatism

This table presents the results from an event study that examines the effect on accounting conservatism of firms' initial disclosure of inside debt information in 2007. The dependent variable is the change from 2006 to 2007 in a firm's accounting conservatism, measured by *C_SCORE*. CEO relative leverage measures are constructed based on the information disclosed in the firm's 2007 proxy statement. Definitions of all variables are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1) ΔC_SCORE	(2) ΔC_SCORE
Log(1+ CEO relative leverage)	***-0.014****	
	(-2.37)	
High relative leverage		***-0.011****
		(-1.73)
Log(Vega)	0.005**	0.005**
	(2.16)	(2.18)
Log(Delta)	-0.003	-0.003
	(-1.16)	(-1.01)
Salarypct	0.044	0.043
	(1.60)	(1.59)
EDF	0.024	0.026
	(0.38)	(0.41)
Size	0.001	-0.000
	(0.19)	(-0.09)
Lev	-0.729***	-0.726***
	(-31.61)	(-31.54)
MB	-0.029***	-0.029***
	(-4.53)	(-4.65)
Lit	0.022*	0.022*
	(1.78)	(1.86)
Constant	0.303***	0.306***
	(7.01)	(7.06)
Industry effect	Included	Included
Observations	952	952
Adj. R-squared	0.66	0.66

Table 15. Separation of executive pension and deferred compensation

This table presents regression results of the augmented Basu (1997) model as specified in equation (2). The dependent variable is earnings before extraordinary items scaled by the market value of equity at the beginning of the year. In columns (1) and (2), CEO relative leverage measures (continuous and dichotomous) are constructed using the value of executive pension only. In columns (3) and (4), CEO relative leverage measures (continuous and dichotomous) are constructed using the value of executive deferred compensation only. In columns (5) and (6), both pension-based and deferred compensation-based measures of CEO relative leverage are included. All variable definitions are in the Appendix. In parentheses are *t*-statistics based on robust standard errors adjusted for heteroskedasticity and firm-level clustering. The notations of *, **, and *** represent statistical significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Pension		Deferred compensation		Together	
	Log(1+Relative leverage)	High relative leverage	Log(1+Relative leverage)	High relative leverage	Log(1+Relative leverage)	High relative leverage
Ret	-0.130	-0.133	-0.107	-0.102	-0.127	-0.129
	(-1.14)	(-1.21)	(-0.91)	(-0.90)	(-1.10)	(-1.17)
Neg	0.076	0.060	0.082	0.082	0.079	0.063
	(0.89)	(0.70)	(0.96)	(0.96)	(0.92)	(0.73)
Ret*Neg	0.586**	0.533**	0.569**	0.561**	0.591**	0.536**
	(2.48)	(2.33)	(2.38)	(2.35)	(2.52)	(2.35)
CEO pension	0.000	0.005			0.000	0.005
	(0.01)	(0.29)			(0.00)	(0.28)
Ret* CEO pension	0.057	0.080*			0.058	0.080*
	(0.88)	(1.76)			(0.86)	(1.77)
Neg* CEO pension	-0.006	0.015			-0.004	0.015
	(-0.22)	(0.67)			(-0.15)	(0.67)
Ret*Neg* CEO pension	***-0.227****	***-0.151****			***-0.212****	***-0.150****
	(-2.69)	***(-2.03)***			***(-2.46)***	***(-2.02)***
CEO deferred			0.003	0.009	0.002	0.008
			(0.10)	(0.26)	(0.07)	(0.24)
Ret* CEO deferred			-0.000	-0.015	-0.007	-0.016
			(-0.00)	(-0.11)	(-0.06)	(-0.13)
Neg* CEO deferred			-0.019	-0.001	-0.016	-0.000
			(-0.53)	(-0.03)	(-0.43)	(-0.00)
Ret*Neg* CEO deferred			***-0.165***	***-0.048***	***-0.132***	***-0.038***
			(-1.27)	***(-0.31)***	***(-1.01)***	***(-0.25)***
Log(Vega)	0.013	0.013	0.012	0.012	0.013	0.012

	(1.19)	(1.19)	(1.15)	(1.13)	(1.19)	(1.17)
Ret* Log(Vega)	-0.012	-0.013	-0.011	-0.011	-0.012	-0.012
	(-0.96)	(-1.01)	(-0.89)	(-0.87)	(-0.97)	(-1.00)
Neg* Log(Vega)	-0.004	-0.004	-0.003	-0.003	-0.004	-0.004
	(-0.33)	(-0.37)	(-0.29)	(-0.29)	(-0.34)	(-0.37)
Ret*Neg* Log(Vega)	0.054**	0.053**	0.051**	0.051**	0.054**	0.052**
	(2.15)	(2.15)	(2.07)	(2.03)	(2.16)	(2.14)
Log(Delta)	0.010	0.009	0.011	0.010	0.010	0.009
	(1.01)	(0.97)	(1.08)	(1.06)	(1.01)	(0.96)
Ret* Log(Delta)	0.005	0.006	0.001	0.002	0.005	0.006
	(0.22)	(0.26)	(0.06)	(0.08)	(0.22)	(0.27)
Neg* Log(Delta)	-0.025**	-0.024**	-0.025**	-0.025**	-0.025**	-0.024**
	(-2.26)	(-2.21)	(-2.28)	(-2.22)	(-2.22)	(-2.14)
Ret*Neg* Log(Delta)	-0.122***	-0.116***	-0.113***	-0.110***	-0.124***	-0.117***
	(-3.31)	(-3.20)	(-3.15)	(-3.05)	(-3.35)	(-3.20)
Salary	0.047	0.054	0.046	0.047	0.046	0.054
	(0.72)	(0.82)	(0.68)	(0.71)	(0.69)	(0.81)
Ret* Salary	-0.192**	-0.206**	-0.190**	-0.192**	-0.193**	-0.207**
	(-2.16)	(-2.31)	(-2.02)	(-2.09)	(-2.09)	(-2.29)
Neg* Salary	-0.095	-0.093	-0.094	-0.092	-0.098	-0.095
	(-1.24)	(-1.21)	(-1.22)	(-1.21)	(-1.26)	(-1.23)
Ret*Neg* Salary	0.202	0.233	0.187	0.200	0.189	0.229
	(1.20)	(1.38)	(1.09)	(1.17)	(1.11)	(1.35)
EDF	-0.301***	-0.301***	-0.293***	-0.294***	-0.300***	-0.302***
	(-3.17)	(-3.21)	(-3.06)	(-3.07)	(-3.13)	(-3.18)
Ret* EDF	-0.180*	-0.164*	-0.196*	-0.193*	-0.179*	-0.161
	(-1.85)	(-1.74)	(-1.95)	(-1.87)	(-1.75)	(-1.62)
Neg* EDF	-0.040	-0.022	-0.042	-0.038	-0.040	-0.020
	(-0.19)	(-0.11)	(-0.21)	(-0.19)	(-0.19)	(-0.10)
Ret*Neg* EDF	0.790**	0.834**	0.841**	0.849**	0.785**	0.832**
	(2.24)	(2.34)	(2.38)	(2.39)	(2.22)	(2.32)
Size	-0.006	-0.007	-0.005	-0.005	-0.006	-0.007
	(-0.78)	(-0.92)	(-0.67)	(-0.61)	(-0.80)	(-0.93)
Ret*Size	0.022	0.020	0.024	0.023	0.022	0.019
	(1.37)	(1.22)	(1.49)	(1.43)	(1.34)	(1.18)
Neg*Size	0.014	0.013	0.013	0.012	0.014	0.013
	(1.44)	(1.43)	(1.33)	(1.26)	(1.41)	(1.37)

Ret*Neg*Size	0.028	0.032	0.022	0.018	0.031	0.032
	(1.00)	(1.14)	(0.77)	(0.64)	(1.09)	(1.14)
Lev	-0.075	-0.071	-0.079	-0.076	-0.073	-0.066
	(-1.06)	(-1.04)	(-1.06)	(-1.03)	(-1.00)	(-0.93)
Ret*Lev	0.426***	0.391***	0.424***	0.419***	0.424***	0.385***
	(2.91)	(2.84)	(2.76)	(2.73)	(2.77)	(2.65)
Neg*Lev	0.091	0.080	0.100	0.103	0.088	0.079
	(0.98)	(0.88)	(1.05)	(1.07)	(0.93)	(0.85)
Ret*Neg*Lev	-0.325	-0.269	-0.306	-0.265	-0.359	-0.274
	(-1.32)	(-1.14)	(-1.21)	(-1.05)	(-1.43)	(-1.13)
MB	-0.001	-0.001	0.001	0.001	-0.001	-0.001
	(-0.06)	(-0.06)	(0.05)	(0.07)	(-0.06)	(-0.06)
Ret*MB	-0.009	-0.006	-0.013	-0.013	-0.010	-0.007
	(-0.34)	(-0.23)	(-0.46)	(-0.47)	(-0.36)	(-0.25)
Neg*MB	0.009	0.011	0.006	0.005	0.008	0.010
	(0.59)	(0.73)	(0.44)	(0.37)	(0.56)	(0.66)
Ret*Neg*MB	-0.049	-0.053	-0.045	-0.051	-0.043	-0.051
	(-1.05)	(-1.15)	(-0.96)	(-1.07)	(-0.91)	(-1.10)
Lit	-0.030	-0.032	-0.033	-0.034	-0.029	-0.032
	(-1.17)	(-1.22)	(-1.28)	(-1.31)	(-1.12)	(-1.19)
Ret*Lit	0.046	0.067	0.037	0.037	0.045	0.066
	(1.04)	(1.44)	(0.85)	(0.84)	(1.02)	(1.42)
Neg*Lit	0.027	0.034	0.028	0.028	0.028	0.034
	(1.01)	(1.23)	(1.03)	(1.02)	(1.02)	(1.22)
Ret*Neg*Lit	0.020	0.004	0.038	0.043	0.019	0.006
	(0.25)	(0.05)	(0.49)	(0.55)	(0.24)	(0.08)
Constant	-0.069	-0.069	-0.080	-0.084	-0.071	-0.075
	(-1.04)	(-1.07)	(-1.20)	(-1.28)	(-1.07)	(-1.15)
Industry effect	Included	Included	Included	Included	Included	Included
Year effect	Included	Included	Included	Included	Included	Included
Observations	3,018	3,018	3,018	3,018	3,018	3,018
Adj. R-squared	0.42	0.43	0.42	0.42	0.42	0.43

CONCLUSION

Debt holding by managers, i.e., inside debt, aligns the incentives of managers more closely with those of debtholders, reducing agency costs of debt (Jensen and Meckling (1976) and Edmans and Liu (2011)). My thesis investigates the effect of managerial ownership of debt on three respects of corporate activities, including corporate risk-taking, bank loan contracting, and accounting conservatism.

I find in the first chapter that higher managerial ownership of debt implements more conservative policies, in terms of less investment in R&D, more investment in capital expenditures, more corporate diversification and lower financial leverage. In the second chapter I find that loans to firms with larger managerial debt holdings are associated with lower loan spreads, smaller lending syndicates, fewer covenant restrictions, and less collateral requirement. Further, in the third chapter I find significant evidence of less conservative financial reporting at firms whose CEOs have accumulated more deferred compensation and pension benefits. These findings are more pronounced when default risk in these firms is higher. Moreover, my findings are robust to correcting for potential endogeneity of managerial ownership of debt, different measures of managerial ownership of debt, and different sampling approaches. Collectively, these results show the significant role of managerial ownership of debt in mitigating agency costs of debt.

The contributions of my thesis to the literature are in two folds. First, my thesis provides supporting empirical evidence to the existing theoretical work (Jensen and Meckling (1976) and Edmans and Liu (2010)). While extensive use of stock options induces managers to take on risky projects, it may provide managers with incentives to engage in risk-taking activities that expropriate debtholders. My findings suggest that another important component of managerial compensation, i.e., inside debt, appears to offset the byproduct effects of equity based

compensation by mitigating agency costs of debt. My thesis contributes to the growing body of research on debt-like component of executive compensation.

Second, my findings have implications for the optimal design of executive compensation contracts. Firms setting up supplementary executive pension plans (SERPs) and paying above-market interest rate on deferred compensation are considered by some as examples of stealth compensation that undermine shareholder value (Bebchuk and Fried (2004)). My findings suggest that debt-like compensation components can also generate some benefits in the form of lower risk-taking and lower costs of debt. Shareholders may be best served if boards can take into account both the costs and benefits of these items in designing efficient executive remuneration packages.

BIBLIOGRAPHY

Agrawal, Anup, and Gershon N. Mandelker, 1987, Managerial incentives and corporate investment and financing decisions, *Journal of Finance* 42, 823-837.

Ahmed, Anwer, Bruce Billings, Richard Morton, and Mary Harris Stanford, 2002, The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs, *The Accounting Review* 77, 867–890.

Ahmed, Anwer, and Scott Deullman, 2007, Accounting conservatism and board of director characteristics: An empirical analysis, *Journal of Accounting and Economics* 43, 411–437.

Amihud, Yakov, and Baruch Lev, 1981, Risk reduction as a managerial motive for conglomerate mergers, *The Bell Journal of Economics* 12, 605-617.

Ball, Ray, 2001, Infrastructure requirements for an economically efficient system of public financial reporting and disclosure, *Brookings-Wharton Papers on Financial Services*, 127-169.

Ball, Ray, S. P. Kothari, and Ashok Robin, 2000, The effect of international institutional factors on properties of accounting earnings, *Journal of Accounting and Economics* 29, 1–51.

Ball, Ray, Ashok Robin, and Gil Sadka, 2008, Is accounting conservatism due to debt or equity markets? An international test of timeliness and conservatism, *Review of Accounting Studies* 13, 168–205.

Ball, Ray, and Lakshmanan Shivakumar, 2005, Earnings quality in U.K. private firms, *Journal of Accounting and Economics* 39, 83–128.

Ball, Ray, and Lakshmanan Shivakumar, 2006, The role of accruals in asymmetrically timely gains and loss recognition, *Journal of Accounting Research* 44, 207–42.

Basu, Sudipta, 1997, The conservatism principle and the asymmetric timeliness of earnings, *Journal of Accounting and Economics* 24, 3–37.

Beatty, Anne, Joseph Weber, and Jeff Yu, 2008, Conservatism and debt, *Journal of Accounting and Economics* 45, 154–74.

Bebchuk, Lucian A., and Jesse M. Fried, 2004, Stealth compensation via retirement benefits, *Berkeley Business Law Journal* 1, 291-326.

Bharath, Sreedhar, and Tyler Shumway, 2008, Forecasting default with the Merton distance-to-default model, *Review of Financial Studies* 21, 1339-1369.

Bharath, Sreedhar T., Sandeep Dahiya, Anthony Saunders, and Anand Srinivasan, 2009, Lending relationships and loan contract terms, *Review of Financial Studies*, forthcoming.

Billett, Matthew T., David C. Mauer, and Yilei Zhang, 2010, Stockholder and Bondholder Wealth Effects of CEO Incentive Grants, *Financial Management* 39, 463-487.

Chava, Sudheer, Dmitry Livdan, and Amiyatosh Purnanandam, 2009, Do shareholder rights affect the cost of bank loans? *Review of Financial Studies* 22, 2973-3004.

Chava, Sundheer, and Michael R. Roberts, 2008, How does financing impact investment? The role of debt covenants, *Journal of Finance* 63, 2085–2121.

Chevalier, Judith, and Glenn Ellison, 1999, Career concerns of mutual fund managers, *Quarterly Journal of Economics* 114, 389-432.

Coles, Jeffrey L., Naveen D. Daniel, and Lalitha Naveen, 2006, Managerial Incentives and Risk-Taking, *Journal of Financial Economics* 79, 431-368.

Core, John, and Wayne Guay, 2002, Estimating the value of employee stock option portfolios and their sensitivities to price and volatility, *Journal of Accounting Research* 40, 613-630.

Core, John, and Wayne Guay, and Divid Larcker, 2003, Executive equity compensation and incentives: A survey, *FRBNY Economic Policy Research* 9, 27-50.

Daniel, Naveen D., J. Spencer Martin, and Lalitha Naveen, 2004, The hidden cost of managerial incentives: Evidence from the bond and stock markets, Working paper, Drexel University.

DeFusco, Richard A., Robert R. Johnson, and Thomas S. Zorn, 1990, The effect of executive stock option plans on stockholders and bondholders, *Journal of Finance* 45, 617-627.

Diamond, Douglas, 1984, Financial intermediation and delegated monitoring, *Review of Economic Studies* 51, 393–414.

Diamond, Douglas, 1991, Monitoring and reputation: The choice between bank loans and directly placed debt, *Journal of Political Economy* 99, 689–721.

Dietrich, Richard, Karl Muller, and Edward Riedl, 2007, Asymmetric timeliness tests of accounting conservatism, *Review of Accounting Studies* 12, 95–124.

Edmans, Alex, and Qi Liu, 2011, Inside debt, *Review of Finance*, forthcoming.

Farber, David, Hsin-Yi Hsieh, Boochun Jung, and Han Yi, 2010, Labor unions and accounting conservatism, Working paper, University of Missouri.

Faulkender, Michael, and Mitchell A. Petersen, 2006, Does the source of capital affect capital structure? *Review of Financial Studies* 19, 45-79.

Gerakos, Joseph, 2007, CEO pensions: disclosure, managerial power, and optimal contracting, Working paper.

Givoly, Dan, and Carla Hayn, 2000, The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics* 29, 287–320.

Givoly, Dan, Carla Hayn, and Ashok Natarajan, 2006, Measuring reporting conservatism, *The Accounting Review* 82, 65–106.

Graham, John R., Si Li, and Jiaping Qiu, 2008, Corporate misreporting and bank loan contracting, *Journal of Financial Economics* 89, 44-61.

Guay, Wayne R., 1999. The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants, *Journal of Financial Economics* 53, 43-71.

Hasbrouck, Joel, 2009, Trading costs and returns for U.S. equities: Estimating effective costs from daily data, *Journal of Finance* 64, 1445-1477.

Holmstrom, Bengt, 1982, Managerial incentive problems: A dynamic perspective, In Essays in Economics and Management in Honor of Lars Wahlbeck. Helsinki: Swedish School of

Economics.

Hong, Harrison, Jeffrey Kubik, and Amit Solomon, 2000, Security analysts' career concerns and herding of earnings forecasts, *RAND Journal of Economics* 31, 121-144.

Hui, Kaiwai, Sandy Klasa, and Eric Yeung, 2010, Corporate suppliers and customers and accounting conservatism, Working paper, Hong Kong University of Science and Technology.

Hui, Kaiwai, Steve Matsunaga, and Dale Morse, 2009, The impact of conservatism on management earnings forecasts, *Journal of Accounting and Economics* 47, 192–207.

Ivashina, Victoria, 2009, Asymmetric information effects on loan spreads, *Journal of Financial Economics* 92, 300-319.

Ivashina, Victoria, and David Scharfstein, 2010, Bank lending during the financial crisis of 2008, *Journal of Financial Economics* 97, 319-338.

Jensen, Michael C., and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency cost, and ownership structure, *Journal of Financial Economics* 3, 305–360.

John, Teresa, and Kose John, 1993, Top-management compensation and capital structure, *Journal of Finance* 48, 949–974.

Jiang, Wei, Kai Li, and Pei Shao, 2010, When shareholders are creditors: Effects of the simultaneous holding of equity and debt by institutional investors, *Review of Financial Studies* 23, 3595-3637.

Kahan, Marcel, and Bruce Tuckman, 1995, Private versus public lending: Evidence from covenants, in John D. Finnerty and Martin S. Fridson, eds.: *The Yearbook of Fixed Income Investing* (Irwin,New York).

Khan, Mozaffar, and Ross Watts, R., 2009, Estimation and empirical properties of a firm-year measure of accounting conservatism, *Journal of Accounting and Economics* 48, 132-150.

Kim, E. Han, and Yao Lu, 2011, CEO Ownership and valuation, *Journal of Financial Economics*, forthcoming.

Lafond, Ryan, and Sugata Roychowdhury, 2008, Managerial ownership and accounting

conservatism, *Journal of Accounting Research* 46, 101–35.

Lamont, Owen, 2002, Macroeconomic forecasts and microeconomic forecasters, *Journal of Economic Behavior and Organization* 16, 265-280.

Leung, Winnie, Oliver Li, and Oliver Rui, 2010, Labor unions and accounting conservatism, Working paper, Chinese University of Hong Kong.

Lin, Chen, Yue Ma, Paul H. Malatesta, and Yuhai Xuan, 2010, Ownership Structure and the Cost of Corporate Borrowing, *Journal of Financial Economics*, forthcoming.

Ma, Tao, and Xiumin Martin, 2010, CEO compensation structure and asymmetric timely loss recognition: An empirical analysis from debt contracting perspective, Working paper, Washington University.

Merton, Robert, 1974. On the pricing of corporate debt and the risk structure of interest rates, *Journal of Finance* 29, 449-470.

Myers, Stewart C., 1977. Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147-175.

Nikolaev, Valeri, 2010, Debt covenants and accounting conservatism, *Journal of Accounting Research* 48, 51-89.

Nini, Greg, David C. Smith, and Amir Sufi, 2009. Creditor control rights and firm investment policy, *Journal of Financial Economics* 92, 400-420.

Ortiz-Molina, Hernan, 2006, Top-management incentives and the pricing of corporate public debt, *Journal of Financial and Quantitative Analysis* 41, 317-340.

Petersen, Mitchell A., 2009, Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies* 22, 435-480.

Rajan, Raghuram G., 1992, Insiders and outsiders: The choice between informed and arm's length debt, *Journal of Finance* 50, 1421–1460.

Rajan, Raghuram, and Luigi Zingales, 1995, What do we know about capital structure? Some evidence from international data, *Journal of Finance* 50, 1421-60.

Santos, Joao A.C., 2010, Bank corporate loan pricing following the subprime crisis, *Review of Financial Studies*, forthcoming.

Smith, Clifford W., and Jerome B. Warner, 1979, On financial contracting: An analysis of bond covenants, *Journal of Financial Economics* 7, 117–161.

Standard & Poor's, 2004, Standard & Poor's corporate governance scores and evaluations: Criteria, methodology and definitions.

Sufi, Amir, 2007, Information asymmetry and financing arrangements: evidence from syndicated loans, *Journal of Finance* 62, 629–668.

Sundaram, Rangarajam, and David Yermack, 2007, Pay me later: Inside debt and its role in managerial compensation, *Journal of Finance* 62, 1551-1588.

Sweeney, Amy P., 1994, Debt covenant violations and managers' accounting responses, *Journal of Accounting and Economics* 17, 281–308.

Tung, Frederick, and Xue Wang, 2010, Bank CEOs, inside debt compensation, and the global financial crisis, Working paper, Emory University.

Watts, Ross, 2003a, Conservatism in accounting part I: Explanations and implications, *Accounting Horizons* 17, 207–221.

Watts, Ross, 2003b, Conservatism in accounting part II: Evidence and research opportunities, *Accounting Horizons* 17, 287–301.

Watts, Ross, and Jerold Zimmerman, 1986, Positive Accounting Theory, Englewood Cliffs, NJ: Prentice-Hall.

Wei, Chenyang, and David Yermack, 2010, Deferred compensation, risk, and company value: Investor reactions to CEO incentives, Working paper, Federal Reserve Bank of New York.

Wittenberg-Moerman, Regina, 2008, The role of information asymmetry and financial reporting quality in debt contracting: Evidence from the secondary loan market, *Journal of Accounting and Economics* 46, 240-260.

White, Halbert, 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct

test for heteroskedasticity, *Econometrica* 48, 817-838.

Zhang, Jieying, 2008, Efficiency gains from accounting conservatism: Benefits to lenders and borrowers, *Journal of Accounting and Economics* 45, 27–54.